
S.I. Ltd Contract No: 6571

Client: Tipperary County Council
Engineer: Hassett Leyden & Associates
Contractor: Site Investigations Ltd

Residential Development,
Cuil Greine, Donohill, Co. Tipperary
Site Investigation

Prepared by:

Setch

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Stephen Letch

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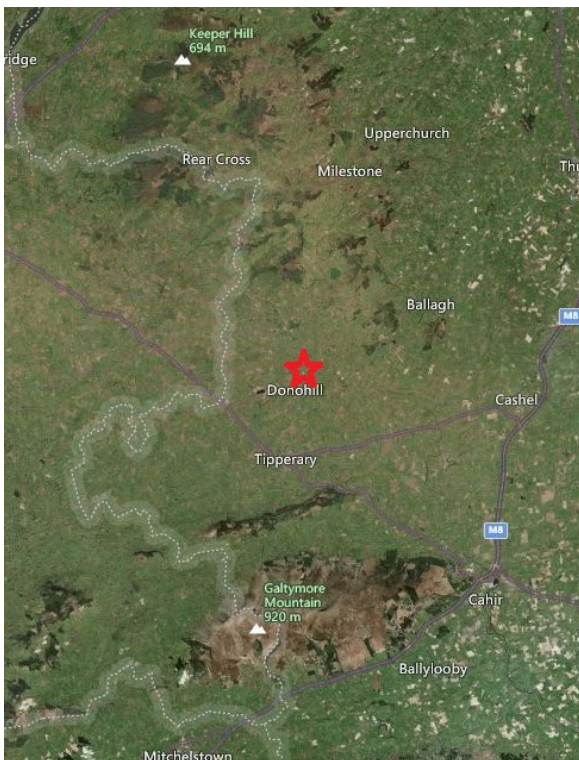
1. Introduction

On the instructions of Hassett Leyden & Associates, Site Investigations Ltd (SIL) were appointed to complete a site investigation at Cuil Griene, Donohill, Co. Tipperary. The investigation was for a residential development and was completed on behalf of the Client, Tipperary County Council. The investigation was completed in October 2025.

This report presents the factual geotechnical data obtained from the field and laboratory testing with interpretation of the ground conditions discussed.

2. Site Location

The site is located to the north of Donohill at Donohill Cross in west Co. Tipperary. The map on the left shows the location of the site in west Co. Tipperary, to the north of Tipperary town, and the second map shows the site location at Donohill Cross.



3. Fieldwork

All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2nd Edition 2016 and Eurocode 7: Geotechnical Design. The fieldworks comprised the following:

- 6 No. cable percussive boreholes
- 3 No. trial pits
- 2 No. soakaway tests

3.1. Cable Percussive Boreholes

Cable percussion boring was completed at 6 No. locations using a Dando 2000 rig and constructed 200mm diameter boreholes. Hand dug inspection pits were excavated to 1.00mbgl after CAT scanning the locations to check for services. BH01 terminated at 8.30mbgl after two hours of chiselling was completed with no further progress. The remaining location reached the scheduled depth of 10.00mbgl with periods of chiselling required to achieve these depths. It was not possible to collect undisturbed samples due to the granular content of the soils encountered so bulk disturbed samples were recovered at regular intervals.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g., BH01 at 1.00mbgl where N=10-(1,0/0,2,3,5)). Where refusal of 50 blows across the test zone was achieved during testing, the penetration depth is also reported (e.g., BH01 at 5.00mbgl where N=50-(10,12/50 for 260mm)).

The cable percussive borehole logs are presented in Appendix 1.

3.2. Trial Pits

3 No. trial pits were excavated using a wheeled excavator. The strata were logged and photographed by SIL geotechnical engineer and groundwater ingresses and pit wall stability was also recorded. Representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

The trial pit logs and photographs are presented in Appendix 2.

3.3. Soakaway Tests

2 No. soakaway tests were excavated to the south of the site and these were logged by SIL geotechnical engineer. BRE Special Digest 365 stipulates that the pit should be filled three times and the final cycle is used to provide the infiltration rate with the time taken for the water level to fall from 75% volume to 25% volume required to calculate the rate of infiltration.

However, if the water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The soakaway test results and photographs are presented in Appendix 3.

3.4. Surveying

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 8.

4. Laboratory Testing

4.1. Geotechnical Testing

Geotechnical soil classification testing has been completed on representative soil samples in accordance with BS 1377 (1990). Testing includes:

- 5 No. moisture contents
- 5 No. Atterberg limits
- 12 No. particle size gradings with 5 No. hydrometers
- 2 No. California Bearing Ratio tests
- 5 No. pH and sulphate content

The geotechnical laboratory test results are presented in Appendix 4.

4.2. Environmental Testing

Environmental testing is currently ongoing by ALS Environmental Ltd. and consists of the following:

- 1 No. Suite I analysis

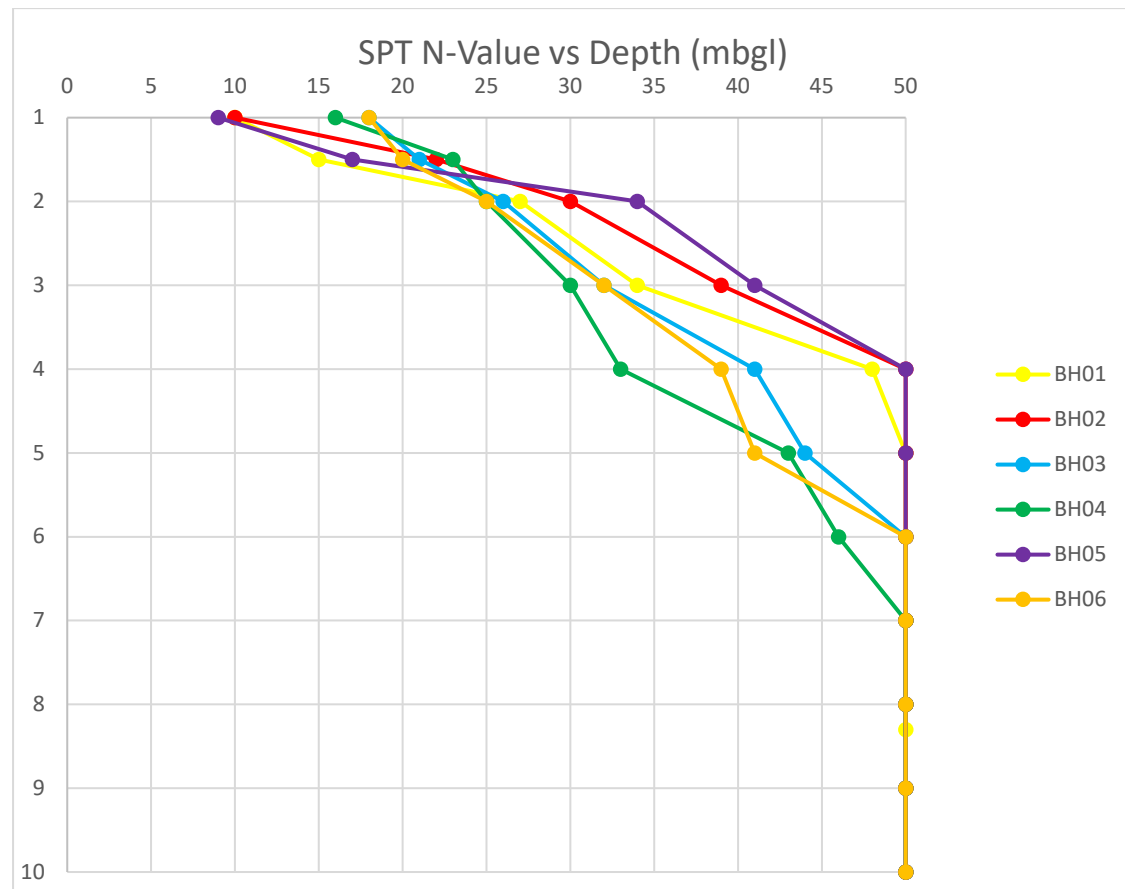
The environmental results will be presented in Appendix 5 and a Waste Classification Report in Appendix 6 when the testing is completed.

5. Ground Conditions

5.1. Overburden

The natural ground conditions are consistent with cohesive (slightly) sandy (slightly) gravelly SILT and CLAY soils with cobbles overlying granular SAND and GRAVEL soils. The boundary was generally between 0.70mbgl and 1.40mbgl but was deeper at 2.10mbgl in BH04.

The SPT N-values were good with values of 9 to 18 at 1.00mbgl, 15 to 23 at 1.50mbgl and 25 to 34 at 2.00mbgl. The graph below shows the SPT N-values vs depth.



The laboratory tests of the samples confirm that all soil types are present on site with cohesive CLAY and SILT identified and granular SAND and GRAVEL soils present. The CLAY soils recorded low plasticity indices of 8% to 15% with the fines content of 19% to 51% in the cohesive soils.

5.2. Groundwater

No groundwater was recorded in the boreholes, trial pits or soakaway tests during the fieldworks period.

6. Recommendations and Conclusions

Please note the following caveats:

The recommendations given, and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for

adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.

Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.

If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.

6.1. Shallow Foundations

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

The boreholes BH02 to BH06 recorded CLAY soils at 1.00mbgl with SPT N-values ranging from 9 to 18. For cohesive soils, a correlation proposed by Stroud and Butler between SPT N-values and plasticity indices can be used to calculate the undrained shear strength. Dependent on the plasticity index at each site, the Stroud and Butler correlation is $C_u=4$ to $6N$. With the low plasticity indexes recorded in the laboratory for the soils on this site, the correlation chosen is $C_u=6N$.

The lowest SPT N-value of 9 at 1.00mbgl indicates a C_u of 54kN/m^2 and this can be used to calculate the ultimate bearing capacity, and this has been calculated to be 293 kN/m^2 . Finally, a factor of safety is applied and with a factor of 3, an allowable bearing capacity of 100kN/m^2 would be anticipated using this lower SPT value.

BH01 recorded granular SAND at 1.00mbgl with an SPT N-value of 10. In granular soils, the SPT N-value can then be used to calculate the allowable bearing capacity, as per Terzaghi and Peck, using the correlation of $\text{SPT N-value} \times 10 = \text{ABC}$. Therefore, at this location, an allowable bearing capacity of 100kN/m^2 , as per the cohesive soils, would be anticipated.

The SPT N-value at BH04 increased to 23 at 1.50mbgl in the cohesive soils. This indicates a C_u of 138kN/m^2 , an ultimate bearing capacity of 731kN/m^2 and an allowable bearing capacity of 245kN/m^2 .

The remaining boreholes recorded granular soils with N-values of 15 to 22 indicating an allowable bearing capacity of 150kN/m².

The following assumptions were made as part of these analyses. If any of these assumptions are not in accordance with detailed design or observations made during construction these recommendations should be re-evaluated.

- Foundations are to be constructed on a level formation of uniform material type (described above).
- All man-made or filled material is to be removed prior to construction.
- The bulk unit weight of the material in this stratum has a minimum density of 19kN/m³.
- All bearing capacity calculations allow for a settlement of 25mm.
- Based on groundwater observations this analysis assumes the groundwater will not influence the construction or performance of these foundations.

TP02 recorded a major collapse of the pit walls forcing completion of the pits and due to the granular nature of the soils, it would be recommended that all excavations be checked immediately and battered back accordingly. Regular inspection of temporary excavations should be completed during construction to ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

6.2. Groundwater

The caveats below relating to interpretation of groundwater levels should be noted:

There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.

Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.

Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall and possible nearby construction sites.

Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.

As discussed previously, no groundwater was recorded during the fieldworks period.

The granular nature of the soils provides good drainage for the groundwater and it is considered likely that any shallow ingress (less than 2.00mbgl) into excavations will be slow to medium.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

6.3. Soakaway Tests

The soakaway tests passed the specification with f-values of $6.64 \times 10^{-5} \text{m/s}$ and $4.49 \times 10^{-5} \text{m/s}$ calculated.

If the soakaways can be targeted at the granular soils, then these will have a higher permeability than the cohesive soils and allow for faster drainage of the groundwater into the surrounding soil.

6.4. Contamination

Environmental testing was carried out on one sample from the investigation and the results will be provided in Appendix 5. For material to be removed from site, Suite I testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

The Waste Classification Report in Appendix 6, created using HazWasteOnline™ software, shows that the material tested can be classified as non-hazardous material with waste code 17-05-04.

Following this analysis of the solid test results, the leachate WAC analysis results were analysed in accordance with 2003/33/EC inert criteria and this shows that the soils can be treated as inert.

Finally, as the soils are non-hazardous and inert, a soil recovery facility screening has been completed and this is provided in Appendix 7. Unfortunately, due to the slightly elevated polyaromatic hydrocarbon value, this fails the soils recovery facility criteria and therefore, any soils must be sent to a suitable landfill.

One sample was tested for analysis but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils.

Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

6.5. Aggressive Ground Conditions

The chemical test results in Appendix 4 indicate a general pH value between 7.51 and 8.08, which is close to neutral and indicates that no special precautions are required.

The maximum value obtained for water soluble sulphate was 124mg/l as SO₃. The BRE Special Digest 1:2005 – ‘Concrete in Aggressive Ground’ guidelines require SO₄ values and after conversion (SO₄ = SO₃ x 1.2), the maximum value of 149mg/l shows Class 1 conditions and no special precautions are required.

6.6 Radon Gas

The Environmental Protection Agency (EPA) has recently updated the Radon gas exposure map and this is available to view on the EPA website. This shows the possible exposure to radon gas with the bedrock geology, subsoil geology, soil permeability and aquifer type analysed to produce the map. The map below shows that the site falls in the medium level of 1 in 10 homes are at risk of radon exposure. Measures should be taken in the form of radon protection barriers from radon exposure in the new structures.



EPA map identifying possible Radon exposure.

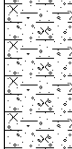
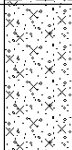
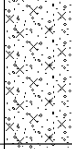
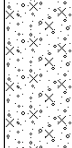
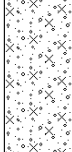
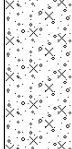
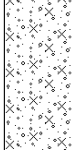
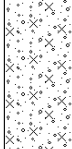
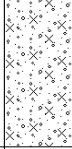
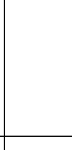
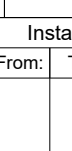
<https://gis.epa.ie/EPAMaps/Radon?&lid=EPA:RadonRiskMapofIreland>

Appendix 1

Cable Percussive Borehole Logs

Contract No: 6571		Cable Percussion Borehole Log										Borehole No: BH01							
Contract:		Housing Development					Easting:		590403.493		Date Started:		13/10/2025						
Location:		Cuil Griene, Donohill, Co. Tipperary					Northing:		643068.332		Date Completed:		13/10/2025						
Client:		Tipperary County Council					Elevation:		96.16		Drilled By:		D.McEoin						
Engineer:		Hassett Leyden & Associates					Borehole Diameter:		200mm		Status:		FINAL						
Depth (m)		Stratum Description					Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill				
Scale	Depth							Scale	Depth	Depth	Type	Result							
	0.20	TOPSOIL.						96.0	95.96										
0.5		Brown sandy slightly gravelly silty CLAY with medium cobble content.						95.5	95.46										
	0.70	Loose light brown silty gravelly SAND with medium cobble content.						95.0	94.96	1.00	B	DMc21							
1.0								95.0		1.00	C	N=10 (1,0/0,2,3,5)							
	1.20	Medium dense becoming very dense light brown slightly silty very sandy GRAVEL with high cobble content.						94.5		1.50	C	N=15 (2,4/4,4,3,4)							
1.5								94.0		2.00	B	DMc22							
2.0								94.0		2.00	C	N=27 (3,3/7,7,6,7)							
2.5								93.5											
3.0								93.0		3.00	B	DMc23							
3.5								93.0		3.00	C	N=34 (3,5/8,8,8,10)							
4.0								92.5											
4.5								92.0		4.00	B	DMc24							
5.0								92.0		4.00	C	N=48 (8,10/10,12,12,14)							
5.5								91.5											
6.0								91.0		5.00	B	DMc25							
6.5								91.0		5.00	C	N=50 (10,12/50 for 260mm)							
7.0								90.5											
7.5								90.0		6.00	B	DMc26							
8.0								90.0		6.00	C	N=50 (12,14/50 for 255mm)							
8.10								89.5											
8.30								89.0		7.00	B	DMc27							
								89.0		7.00	C	N=50 (13,15/50 for 235mm)							
								88.5											
								88.0		8.00	B	DMc28							
								88.0		8.00	C	50 (25 for 95mm/50 for 15mm)							
								88.0		8.30	C	50 (25 for 5mm/50 for 5mm)							
								87.5											
								87.0											
								86.5											
								86.0											
								85.5											
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Depth:	Rose (20min):	Depth Sealed	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	Cable percussive borehole terminated at 8.30mbgl due to obstruction.		
		6.70	6.90	01:00				13/10	8.30	Dry				0.00	8.30	Arisings			

Contract No: 6571		Cable Percussion Borehole Log										Borehole No: BH02							
Contract:		Housing Development				Easting:		590423.421		Date Started:		09/10/2025							
Location:		Cuil Griene, Donohill, Co. Tipperary				Northing:		643066.657		Date Completed:		09/10/2025							
Client:		Tipperary County Council				Elevation:		95.58		Drilled By:		D.McEoin							
Engineer:		Hassett Leyden & Associates				Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description				Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill					
Scale	Depth						Scale	Depth	Depth	Type	Result								
0.20	0.20	TOPSOIL.					95.5	95.38											
0.5		Brown sandy slightly gravelly silty CLAY with medium cobble content.					95.0	94.78											
0.80	0.80	Firm light brown very sandy slightly gravelly clayey SILT with medium cobble content.					94.5	94.28	1.00	B	DMc01								
1.0							94.0		1.00	C	N=10 (1,2/2,2,3,3)								
1.30	1.30	Medium dense becoming very dense light brown slightly silty very sandy GRAVEL with high cobble content.					94.0		1.50	C	N=22 (3,3/4,4,6,8)								
1.5							93.5		2.00	B	DMc02								
2.0							93.0		2.00	C	N=30 (5,5/10,7,7,6)								
2.5							92.5		3.00	B	DMc03								
3.0							92.0		3.00	C	N=39 (7,7/7,12,10,10)								
3.5							91.5		4.00	B	DMc04								
4.0							91.0		4.00	C	N=50 (5,12/50 for 285mm)								
4.5							90.5		5.00	B	DMc05								
5.0							90.0		5.00	C	50 (12,15/50 for 225mm)								
5.5							89.5		6.00	B	DMc06								
6.0							89.0		6.00	C	50 (18,19/50 for 125mm)								
6.5							88.5		7.00	B	DMc07								
7.0							88.0		7.00	C	N=50 (12,14/50 for 240mm)								
7.5							87.5		8.00	B	DMc08								
8.0							87.0		8.00	C	50 (10,15/50 for 50mm)								
8.5							86.5		9.00	B	DMc09								
9.0							86.0		9.00	C	N=50 (19,16/50 for 265mm)								
9.5							85.5		10.00	B	DMc10								
10.0	10.00	End of Borehole at 10.00m					85.0		10.00	C	N=50 (12,12/50 for 250mm)								
10.5																			
		Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Depth:	Rose (20min):	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-		
		6.30	6.50	01:00				09/10	10.00	Dry				0.00	10.00	Arisings			

Contract No: 6571		Cable Percussion Borehole Log										Borehole No: BH03						
Contract:		Housing Development					Easting:		590453.997		Date Started:		10/10/2025					
Location:		Cuil Griene, Donohill, Co. Tipperary					Northing:		643058.490		Date Completed:		10/10/2025					
Client:		Tipperary County Council					Elevation:		94.81		Drilled By:		B. Higgenbotham					
Engineer:		Hassett Leyden & Associates					Borehole Diameter:		200mm		Status:		FINAL					
Depth (m)		Stratum Description					Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill			
Scale	Depth							Scale	Depth	Depth	Type	Result						
0.20		TOPSOIL.						94.5	94.61	1.00	B	BH01 N=18 (3,4/4,5,4,5)						
0.5		Stiff brown sandy slightly gravelly silty CLAY.						94.0			1.00					C		
1.0		Medium dense brown silty gravelly SAND.						93.5	93.41	1.00	C	N=21 (2,3/5,5,6,5)						
1.40								93.0		1.50	C							
1.5								92.5		2.00	B	BH02 N=26 (5,6/7,6,7,6)						
2.0								92.0		2.00	C							
2.5								91.5		3.00	B	BH03 N=32 (7,8/7,9,8,8)						
3.0								91.0		3.00	C							
3.5		Dense becoming very dense brown slightly silty very sandy GRAVEL.						91.31	91.31	4.00	B	BH04 N=41 (8,10/9,10,11,11)						
4.0								91.0		4.00	C							
4.5								90.5		4.00	C	BH05 N=44 (8,10/11,11,12,10)						
5.0								90.0		5.00	B							
5.5								89.5		5.00	C	BH06 N=50 (11,12/13,12,11,14)						
6.0								89.0		6.00	B							
6.5								88.5		6.00	C	BH07 N=50 (10,13/50 for 285mm)						
7.0								88.0		7.00	B							
7.5								87.5		7.00	C	BH08 N=50 (12,12/50 for 290mm)						
8.0								87.0		8.00	B							
8.5								86.5		8.00	C	BH09 N=50 (14,11/50 for 255mm)						
9.0								86.0		9.00	B							
9.5								85.5		9.00	C	BH10 N=50 (25 for 140mm/50 for 245mm)						
10.0								85.0		10.00	B							
10.00		End of Borehole at 10.00m						84.81	84.81	10.00	B							
10.5								84.5		10.00	C							
		Chiselling:			Water Strikes:		Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Depth:	Rose (20min):	Depth Sealed	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-	
							10/10	10.00	Dry				0.00	10.00	Arisings			

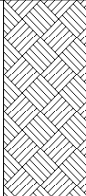
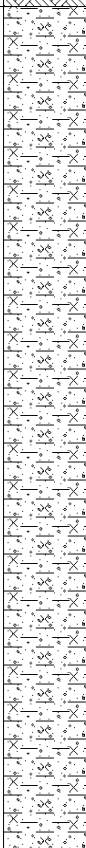
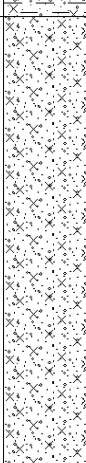
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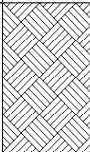
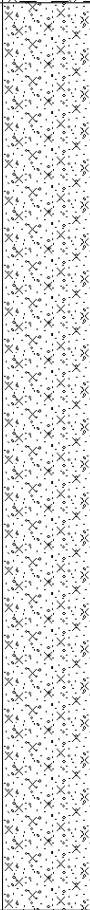
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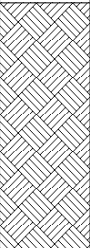
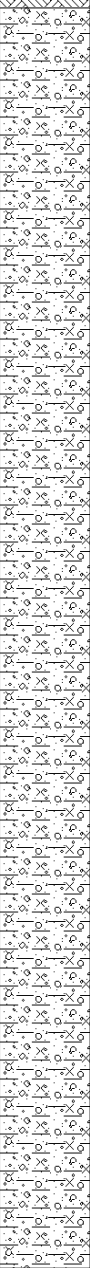
Appendix 2

Trial Pit Logs and Photographs

Contract No: 6571		Trial Pit Log						Trial Pit No: TP01			
Contract:		Housing Development			Easting:	590404.018		Date:	07/10/2025		
Location:		Cuil Griene, Donohill, Co. Tipperary			Northing:	643057.847		Excavator:	JCB 3CX		
Client:		Tipperary County Council			Elevation:	95.11		Logged By:	D. Monaghan		
Engineer:		Hassett Leyden & Associates			Dimensions (LxWxD) (m):	3.00 x 0.90 x 3.00		Status:	FINAL		
Level (mbgl)		Stratum Description				Legend	Level (mOD)		Samples / Field Tests		Water Strike
Scale:	Depth:						Depth	Type	Result		
0.40		TOPSOIL.					95.0	94.71	0.50	B	DM01
							94.5				
		0.5		Firm brown sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone.					94.0	94.0	1.00
1.0		93.5									
1.5		93.0									
2.0		Grey brown silty gravelly fine to coarse SAND. Gravel is fine to coarse, angular to subrounded of limestone.					92.5	92.5	2.00	B	DM03
2.10							92.0				
2.5							91.5				
3.00		Pit terminated at 3.00m					92.11				
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:				
		Scheduled depth.	Minor pit wall collapse during excavations.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental				

Contract No: 6571		Trial Pit Log						Trial Pit No: TP02				
Contract:		Housing Development		Easting:		590421.694		Date:		07/10/2025		
Location:		Cuil Griene, Donohill, Co. Tipperary		Northing:		643059.835		Excavator:		JCB 3CX		
Client:		Tipperary County Council		Elevation:		95.35		Logged By:		D. Monaghan		
Engineer:		Hassett Leyden & Associates		Dimensions (LxWxD) (m):		3.00 x 0.90 x 2.50		Status:		FINAL		
Level (mbgl)		Stratum Description				Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth						Scale:	Depth:	Depth	Type	Result	
0.30 0.5 0.70 1.0 1.5 2.0 2.5		TOPSOIL.					95.0	95.05	0.50	B	DM04	
		Firm brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone.										
		Grey brown silty gravelly fine to coarse SAND. Gravel is fine to coarse, angular to subrounded of limestone.					94.5	94.65	1.00	B	DM05	
Pit terminated due to major pit wall collapse. Pit terminated at 2.50m						92.85						
		Termination:		Pit Wall Stability:		Groundwater Rate:		Remarks:		Key:		
		Major pit wall collapse.		Major pit wall collapse forcing completion.		Dry		-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 6571		Trial Pit Log					Trial Pit No: TP03	
Contract:		Housing Development		Easting:	590449.129	Date:	07/10/2025	
Location:		Cuil Griene, Donohill, Co. Tipperary		Northing:	643053.115	Excavator:	JCB 3CX	
Client:		Tipperary County Council		Elevation:	94.90	Logged By:	D. Monaghan	
Engineer:		Hassett Leyden & Associates		Dimensions (LxWxD) (m):	3.00 x 0.90 x 3.00	Status:	FINAL	

Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.							
0.5	0.50	Firm becoming stiff brown sandy slightly gravelly silty CLAY with low cobble and boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles and boulders are angular to subrounded of limestone.		94.5					
				94.40	0.50	B	DM07		
				94.0	1.00	B	DM08		
1.0				93.5					
				93.0					
1.5				92.5					
2.0				92.0	2.00	B	DM09		
2.5									
3.00					91.90				
		Pit terminated at 3.00m							

	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
	Scheduled depth.	Minor pit wall collapse during excavations.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

TP01 Sidewall



TP01 Spoil



TP02 Sidewall



TP02 Spoil



TP03 Sidewall



TP03 Spoil



Appendix 3

Soakaway Test Results and Photographs

SOAKAWAY TEST



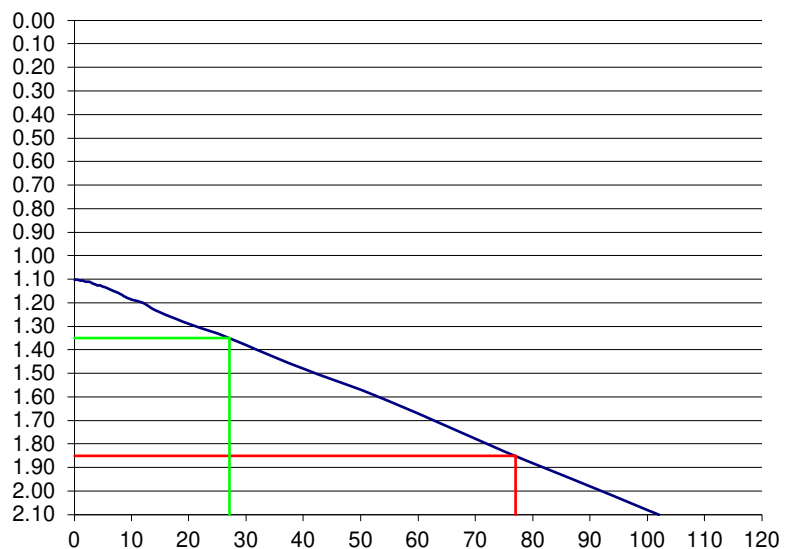
Project Reference:	6571
Contract name:	Residential Development
Location:	Donohill, Co. Tipperary
Test No:	SA01
Date:	07/10/2025

Ground Conditions

From	To	
0.00	0.20	TOPSOIL.
0.20	0.80	Firm brown slightly sandy slightly gravelly silty CLAY.
0.80	1.10	Firm black slightly sandy slightly gravelly silty CLAY.
1.10	1.80	Firm brown slightly sandy slightly gravelly silty CLAY.
1.80	2.10	Brown orange silty gravelly SAND.

Elapsed Time (mins)	Fall of Water (m)
0	1.10
0.5	1.10
1	1.11
1.5	1.11
2	1.11
2.5	1.11
3	1.12
3.5	1.12
4	1.13
4.5	1.13
5	1.13
6	1.14
7	1.15
8	1.16
9	1.18
10	1.19
12	1.20
14	1.23
16	1.25
18	1.27
20	1.29
25	1.33
30	1.38
40	1.48
50	1.57
60	1.67
75	1.83
90	1.98
102	2.10

Pit Dimensions (m)		
Length (m)	2.50	m
Width (m)	0.90	m
Depth	2.10	m
Water		
Start Depth of Water	1.10	m
Depth of Water	1.00	m
75% Full	1.35	m
25% Full	1.85	m
75%-25%	0.50	m
Volume of water (75%-25%)	1.13	m3
Area of Drainage	14.28	m2
Area of Drainage (75%-25%)	5.65	m2
Time		
75% Full	27	min
25% Full	77	min
Time 75% to 25%	50	min
Time 75% to 25% (sec)	3000	sec



$$f = \frac{0.00398}{\text{m/min}}$$

$$\frac{6.64E-05}{\text{m/s}}$$

SOAKAWAY TEST

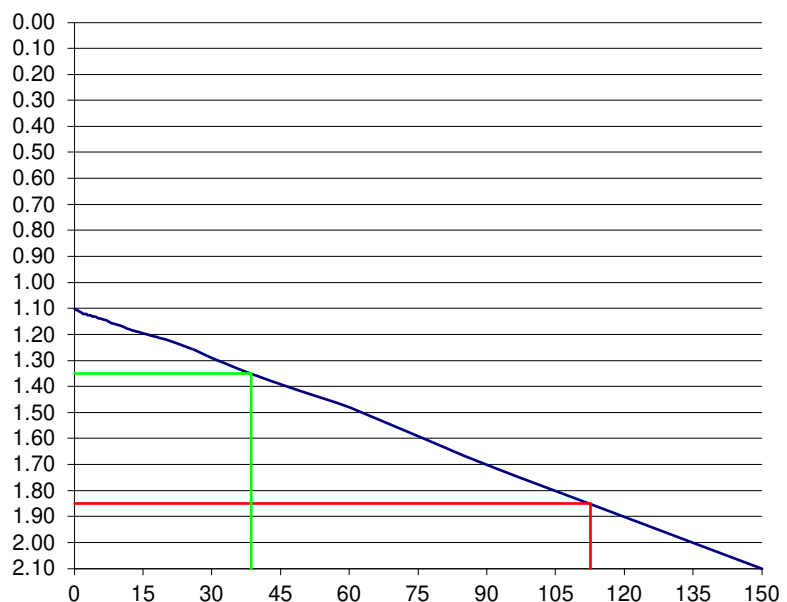


Project Reference:	6571
Contract name:	Residential Development
Location:	Donohill, Co. Tipperary
Test No:	SA02
Date:	07/10/2025

Ground Conditions

From	To	
0.00	0.20	TOPSOIL.
0.20	1.80	Firm brown slightly sandy slightly gravelly silty CLAY.
1.80	2.10	Grey silty SAND.

Elapsed Time (mins)	Fall of Water (m)	Pit Dimensions (m)		
0	1.10	Length (m)	2.50	m
0.5	1.11	Width (m)	0.90	m
1	1.11	Depth	2.10	m
1.5	1.12	Water		
2	1.12	Start Depth of Water	1.10	m
2.5	1.12	Depth of Water	1.00	m
3	1.13	75% Full	1.35	m
3.5	1.13	25% Full	1.85	m
4	1.13	75%-25%	0.50	m
4.5	1.13	Volume of water (75%-25%)	1.13	m3
5	1.14	Area of Drainage	14.28	m2
6	1.14	Area of Drainage (75%-25%)	5.65	m2
7	1.15	Time		
8	1.16	75% Full	38.58	min
9	1.16	25% Full	112.5	min
10	1.17	Time 75% to 25%	73.92	min
12	1.18	Time 75% to 25% (sec)	4435.2	sec



$f = \frac{0.00269}{\text{m/min}}$ or $\frac{4.49E-05}{\text{m/s}}$

SA01 Sidewall



SA01 Spoil



SA02 Sidewall



SA02 Spoil



Appendix 4

Geotechnical Laboratory Test Results

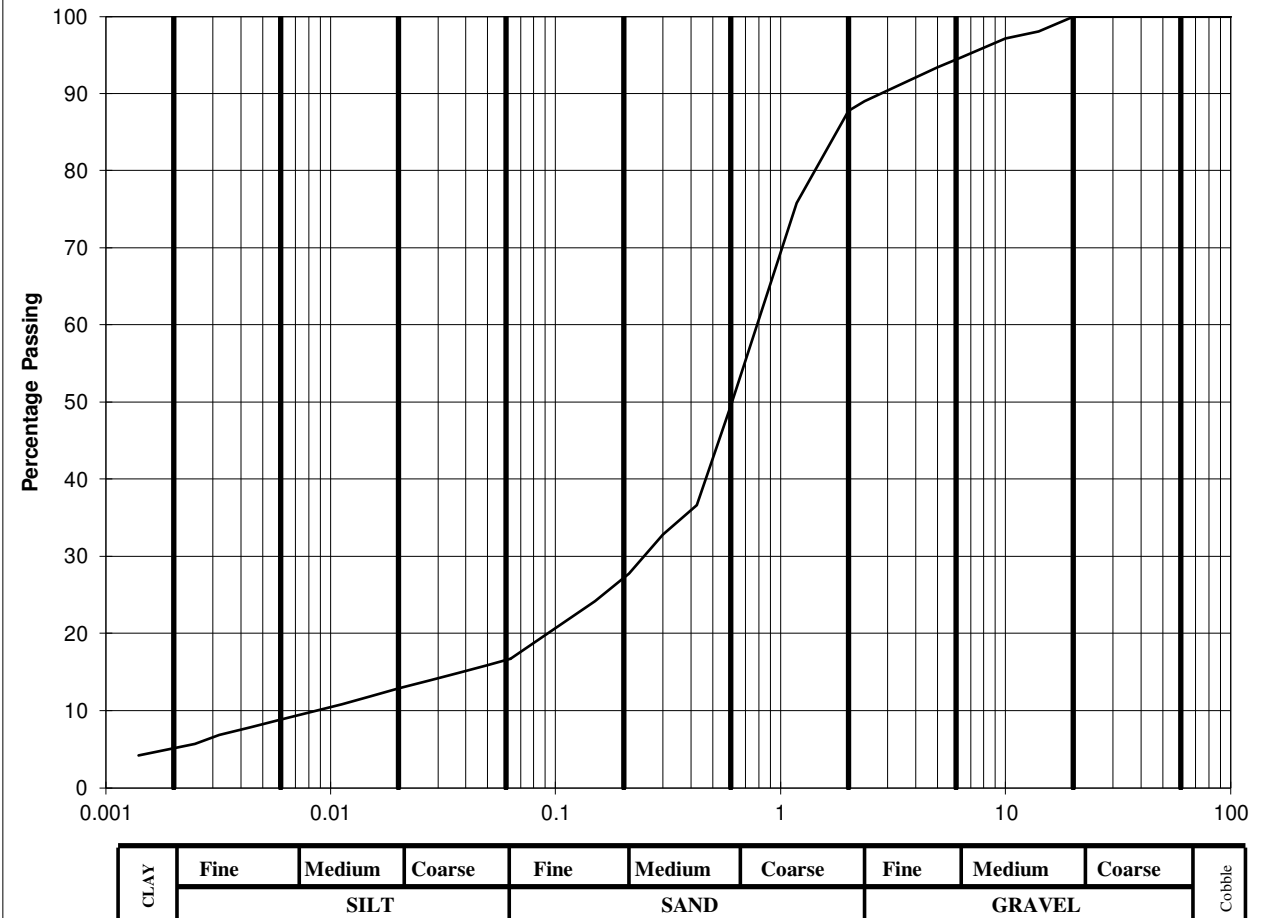
Classification Tests
In accordance with BS 1377: Part 2

Client	Tipperary County Council
Site	Donohill, Tipperary
S.I. File No	6571 / 25
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	24th October 2025

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Bulk Density g/cm ³	Specific gravity	% passing 425um	Comments	Remarks C=Clay; M=Silt Plasticity: L=Low; I=Intermediate; H=High; V=Very High; E=Extremely High
BH02	1.00	DMc01	25/1538	B	13.9	19	NP				36.6		
BH04	1.00	BH21	25/1540	B	19.7	30	18	12			55.0		CL
BH06	1.00	BH11	25/1542	B	11.8	28	20	8			33.2		CL
TP01	1.00	DM02	25/1545	B	12.9	32	18	14			58.3		CL
SA02	1.00	DM11	25/1548	B	19.8	34	19	15			69.4		CL

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	17
90	100	0.0200	13
75	100	0.0060	9
63	100	0.0020	5
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	97.1		
6.3	94.6		
5.0	93.4		
2.36	89		
2.00	87.7		
1.18	75.8		
0.600	49.5		
0.425	36.6		
0.300	32.8		
0.212	27.7		
0.150	24.2		
0.063	17		

Cobbles, %	0
Gravel, %	12
Sand, %	71
Silt, %	12
Clay, %	5



Client :	Tipperary County Council
Project :	Donohill, Tipperary

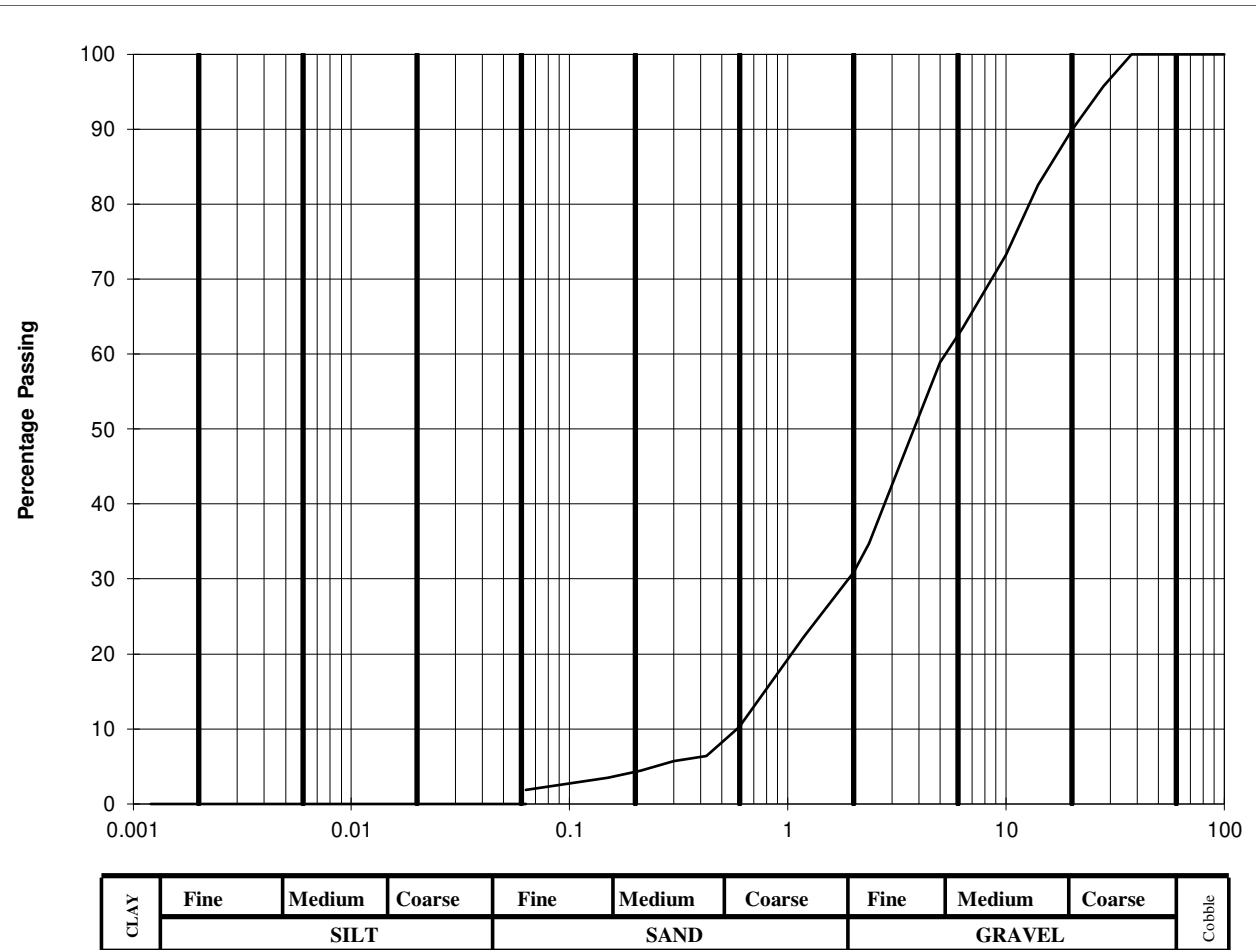
Lab. No :	24/1538
Sample No :	DMc01

Hole ID :	BH 02
Depth, m :	1.00

Material description :	very sandy slightly gravelly clayey SILT
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	95.7		
20	89.9		
14	82.5		
10	73.2		
6.3	63.4		
5.0	58.9		
2.36	34.7		
2.00	30.9		
1.18	22.3		
0.600	10.2		
0.425	6.4		
0.300	5.7		
0.212	4.4		
0.150	3.5		
0.063	2		

Cobbles, %	0
Gravel, %	69
Sand, %	29
Clay / Silt, %	2



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

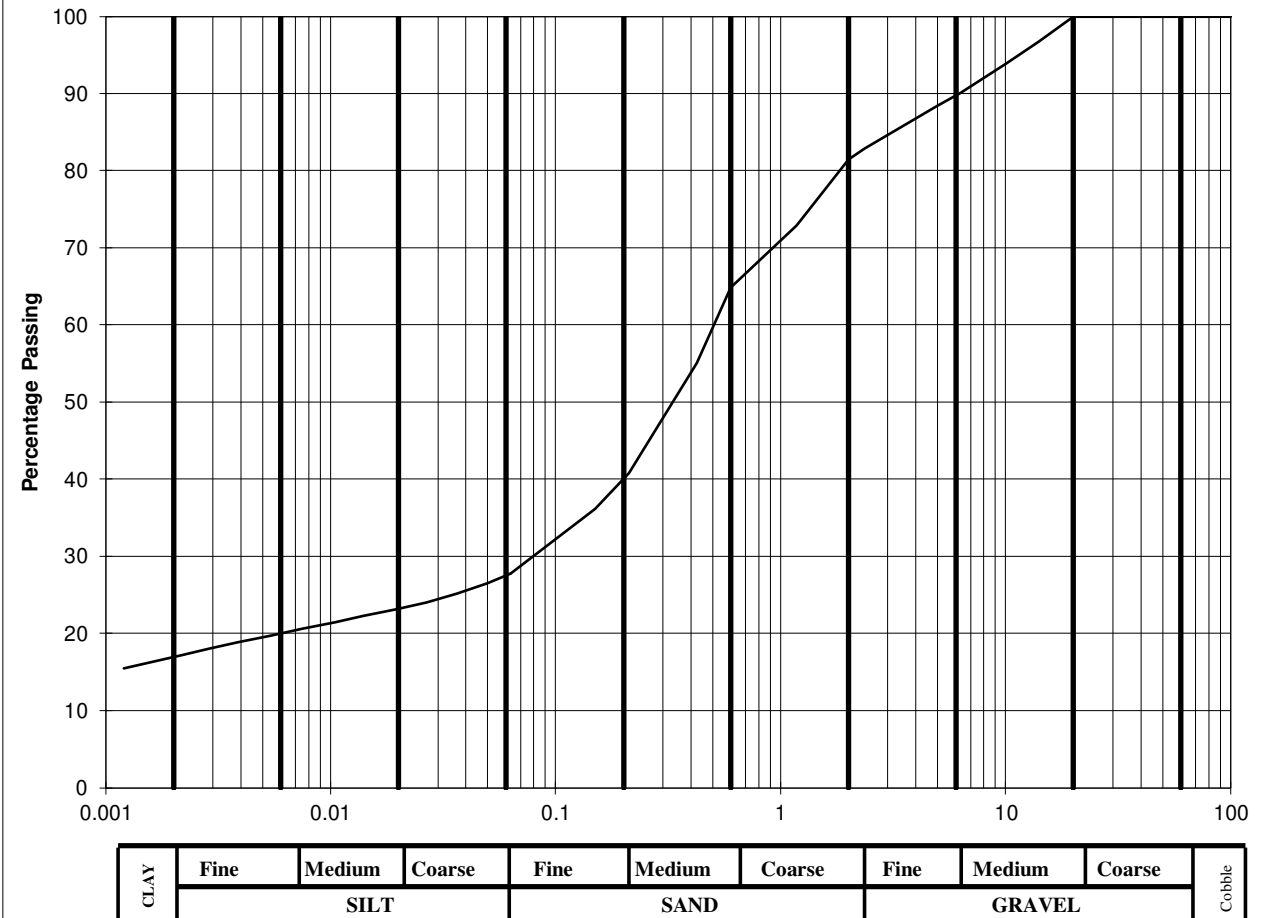
Lab. No :	25/1539
Sample No :	DMc02

Hole ID :	BH 02
Depth, m :	2.00

Material description :	slightly silty very sandy GRAVEL
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	28
90	100	0.0200	23
75	100	0.0060	20
63	100	0.0020	17
50	100		
37.5	100		
28	100		
20	100		
14	96.7		
10	93.8		
6.3	90.1		
5.0	88.4		
2.36	82.8		
2.00	81.4		
1.18	72.9		
0.600	64.8		
0.425	55		
0.300	47.9		
0.212	40.8		
0.150	36.1		
0.063	28		

Cobbles, %	0
Gravel, %	19
Sand, %	53
Silt, %	11
Clay, %	17



Client :	Tipperary County Council
Project :	Donohill, Tipperary

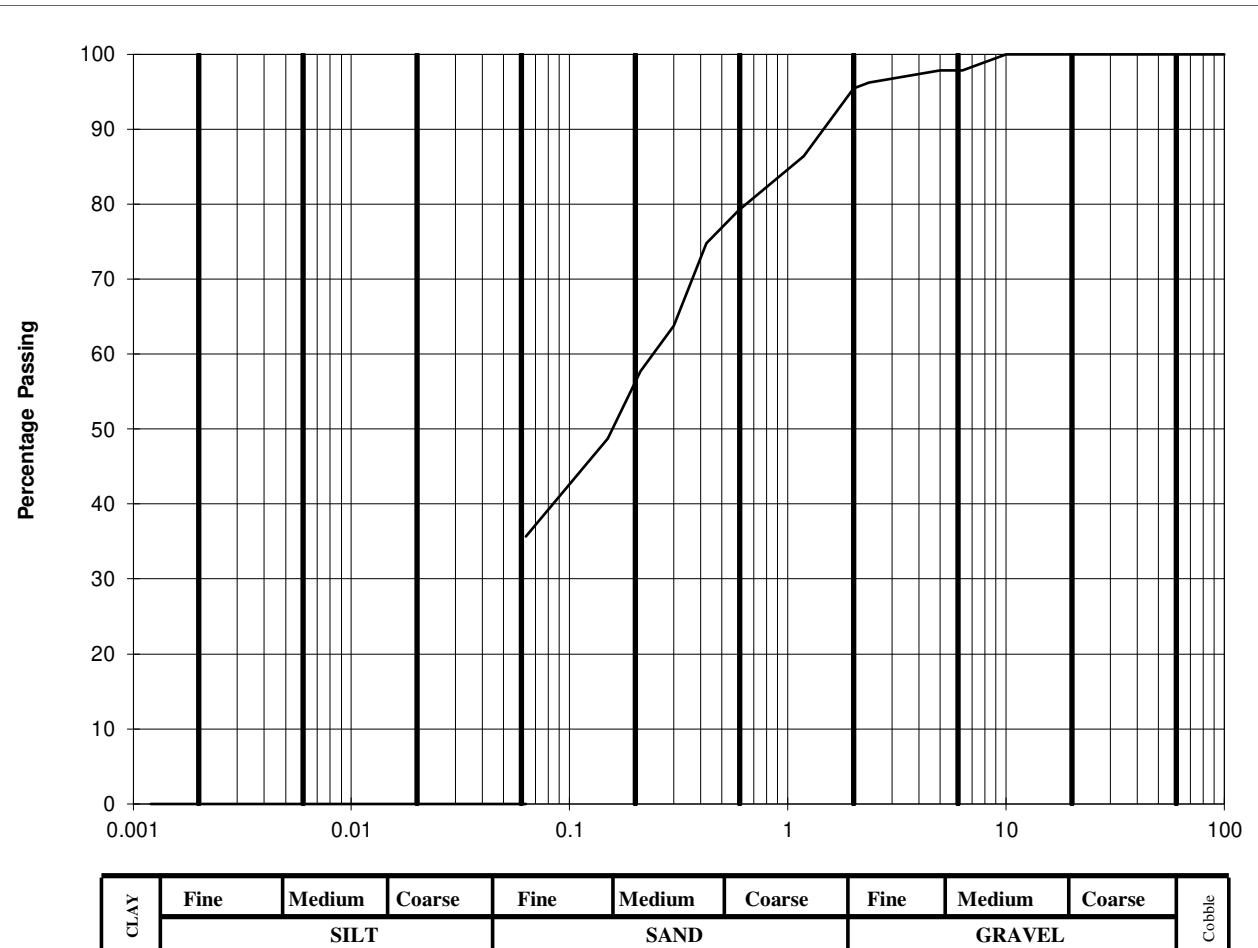
Lab. No :	24/1540
Sample No :	BH21

Hole ID :	BH 04
Depth, m :	1.00

Material description :	sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	97.8		
5.0	97.8		
2.36	96.2		
2.00	95.4		
1.18	86.4		
0.600	79.2		
0.425	74.8		
0.300	63.8		
0.212	57.7		
0.150	48.7		
0.063	36		

Cobbles, %	0
Gravel, %	5
Sand, %	59
Clay / Silt, %	36



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

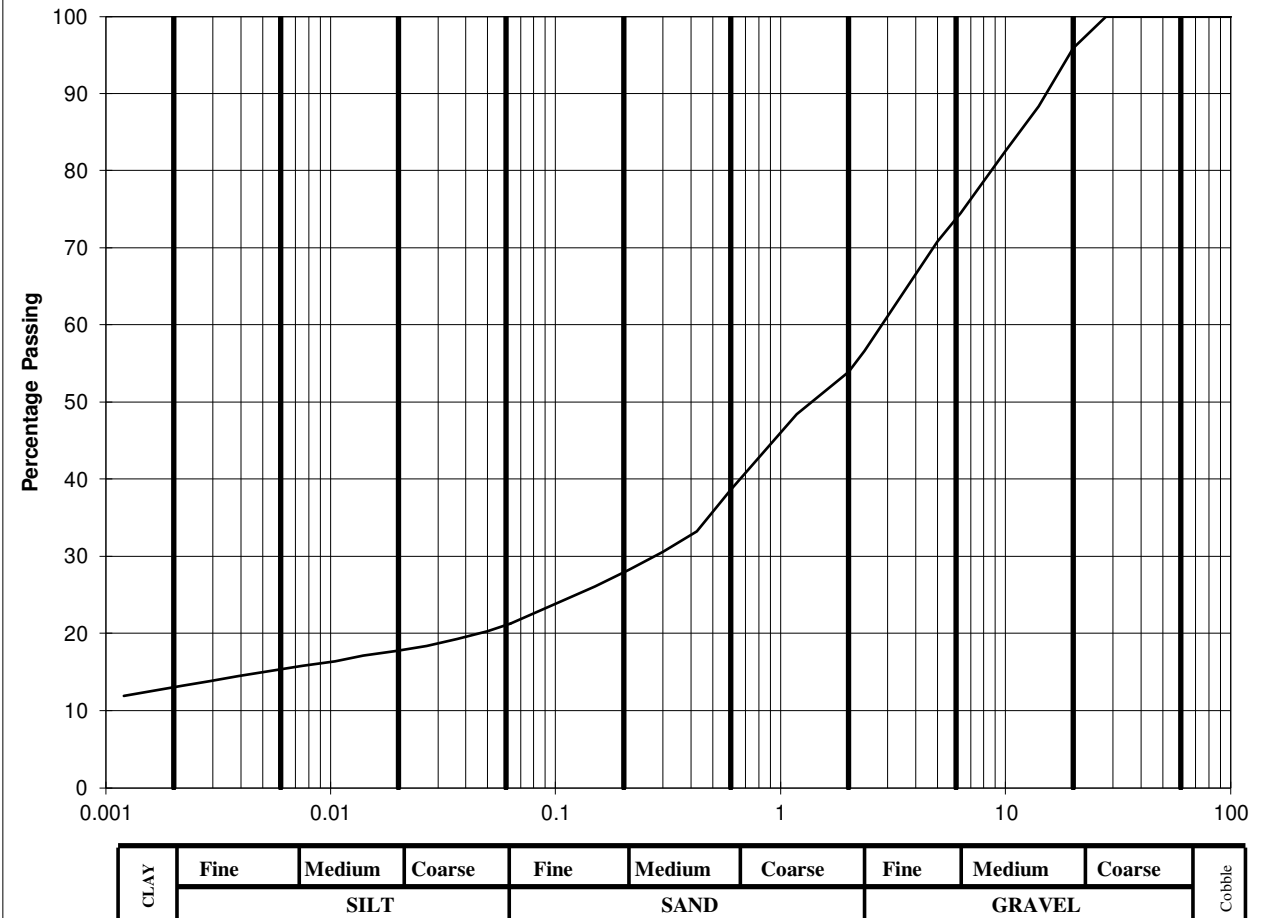
Lab. No :	24/1541
Sample No :	BH22

Hole ID :	BH 04
Depth, m :	2.00

Material description :	sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	21
90	100	0.0200	17
75	100	0.0060	15
63	100	0.0020	13
50	100		
37.5	100		
28	100		
20	95.9		
14	88.3		
10	82.5		
6.3	74.5		
5.0	70.8		
2.36	56.6		
2.00	53.9		
1.18	48.4		
0.600	38.6		
0.425	33.2		
0.300	30.6		
0.212	28.2		
0.150	26.1		
0.063	21		

Cobbles, %	0
Gravel, %	46
Sand, %	33
Silt, %	8
Clay, %	13



Client :	Tipperary County Council
Project :	Donohill, Tipperary

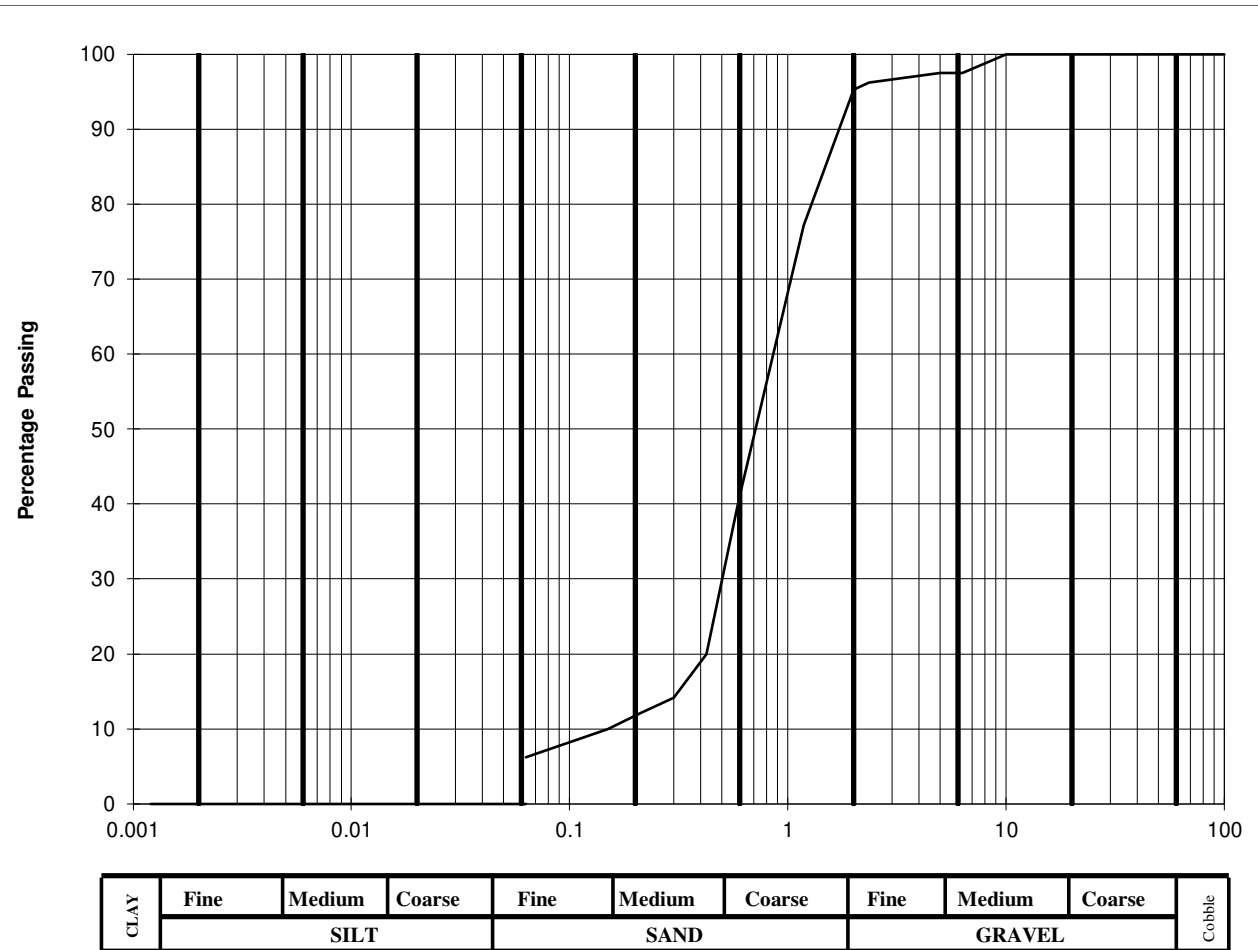
Lab. No :	24/1542
Sample No :	BH11

Hole ID :	BH 06
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	97.5		
5.0	97.5		
2.36	96.2		
2.00	95.3		
1.18	77.2		
0.600	40.7		
0.425	20		
0.300	14.2		
0.212	12.1		
0.150	10		
0.063	6		

Cobbles, %	0
Gravel, %	5
Sand, %	89
Clay / Silt, %	6



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

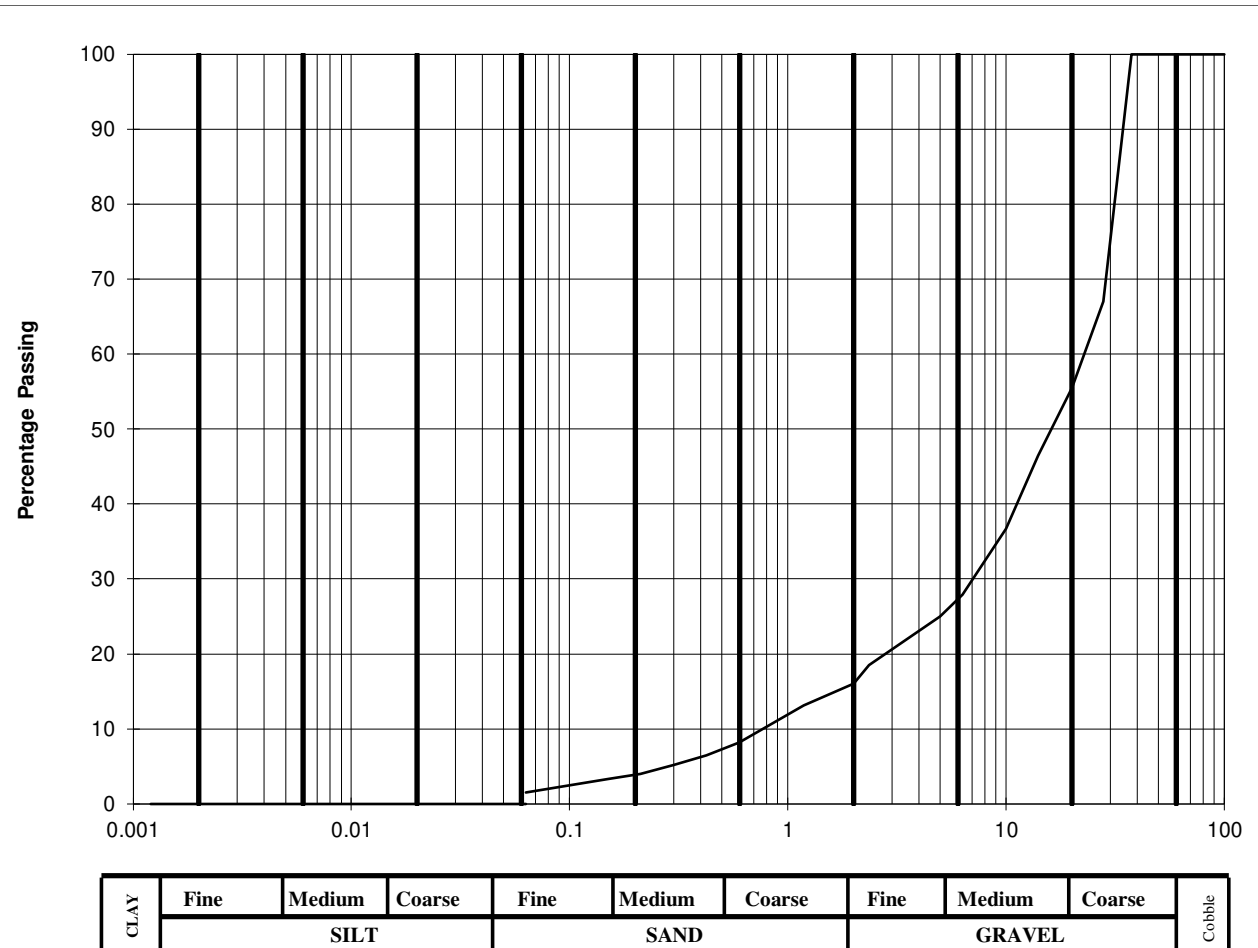
Lab. No :	24/1543
Sample No :	BH12

Hole ID :	BH 06
Depth, m :	2.00

Material description :	silty gravelly SAND
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	67		
20	55.5		
14	46.4		
10	36.7		
6.3	27.9		
5.0	25		
2.36	18.5		
2.00	16		
1.18	13.1		
0.600	8.2		
0.425	6.5		
0.300	5.2		
0.212	4		
0.150	3.3		
0.063	2		

Cobbles, %	0
Gravel, %	84
Sand, %	14
Clay / Silt, %	2



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

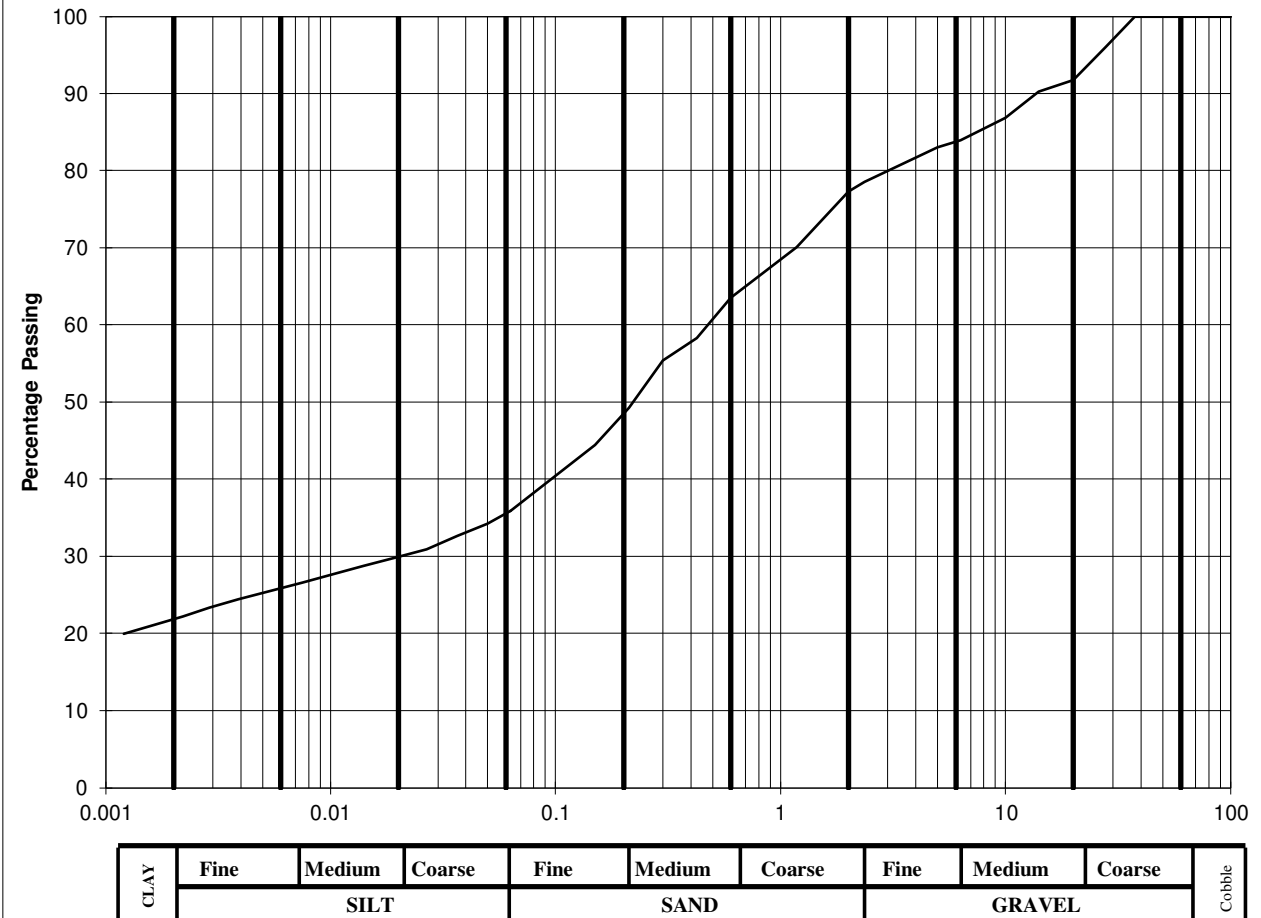
Lab. No :	24/1544
Sample No :	BH13

Hole ID :	BH 06
Depth, m :	3.00

Material description :	slightly silty sandy GRAVEL
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	36
90	100	0.0200	30
75	100	0.0060	26
63	100	0.0020	23
50	100		
37.5	100		
28	96		
20	91.7		
14	90.2		
10	86.8		
6.3	83.9		
5.0	83		
2.36	78.5		
2.00	77.3		
1.18	70.1		
0.600	63.5		
0.425	58.3		
0.300	55.4		
0.212	49.2		
0.150	44.4		
0.063	36		

Cobbles, %	0
Gravel, %	23
Sand, %	41
Silt, %	13
Clay, %	23



Client :	Tipperary County Council
Project :	Donohill, Tipperary

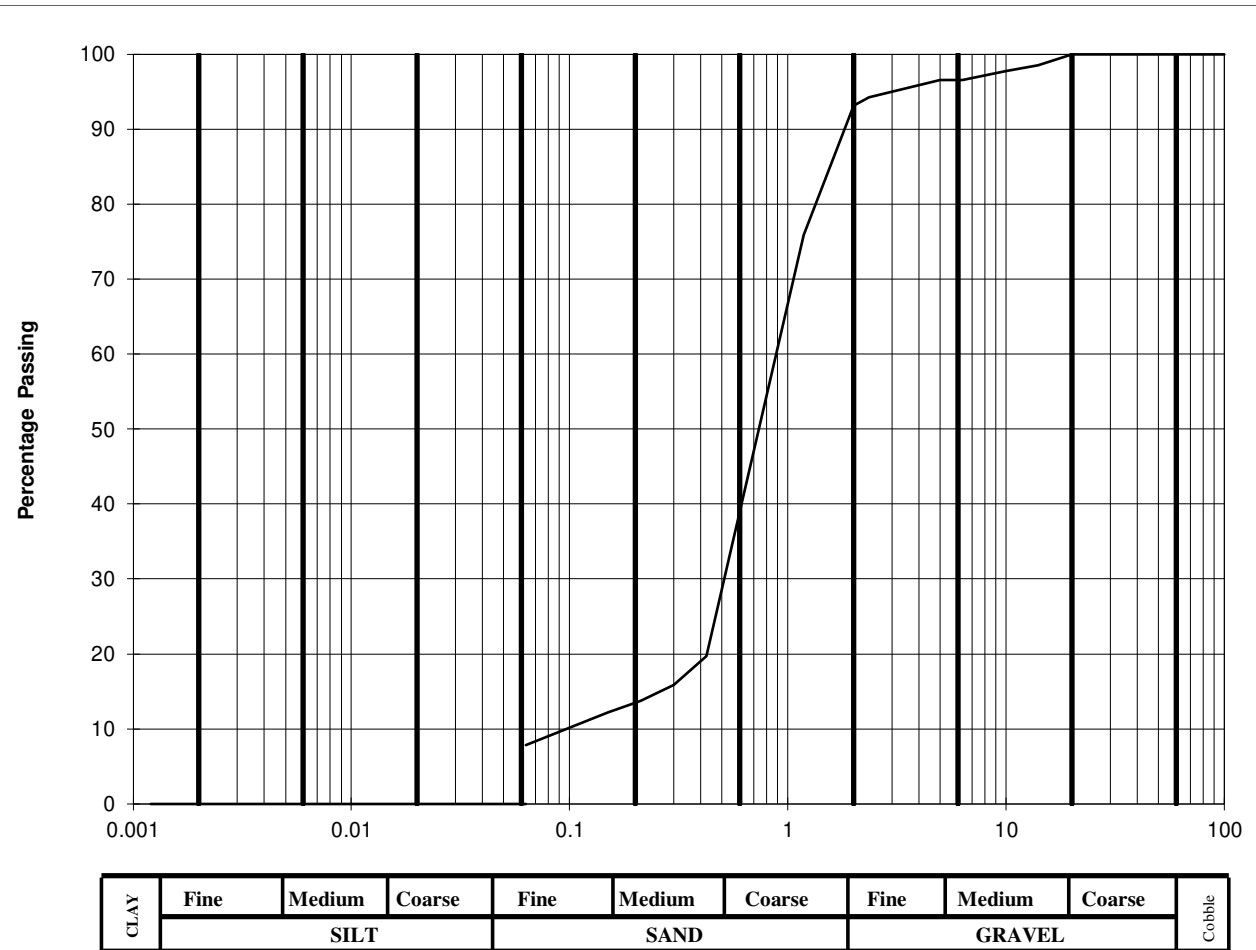
Lab. No :	24/1545
Sample No :	DM02

Hole ID :	TP 01
Depth, m :	1.00

Material description :	sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	100		
20	100		
14	98.5		
10	97.7		
6.3	96.5		
5.0	96.5		
2.36	94.2		
2.00	93.1		
1.18	75.9		
0.600	38.6		
0.425	19.7		
0.300	15.9		
0.212	13.7		
0.150	12.2		
0.063	8		

Cobbles, %	0
Gravel, %	7
Sand, %	85
Clay / Silt, %	8



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

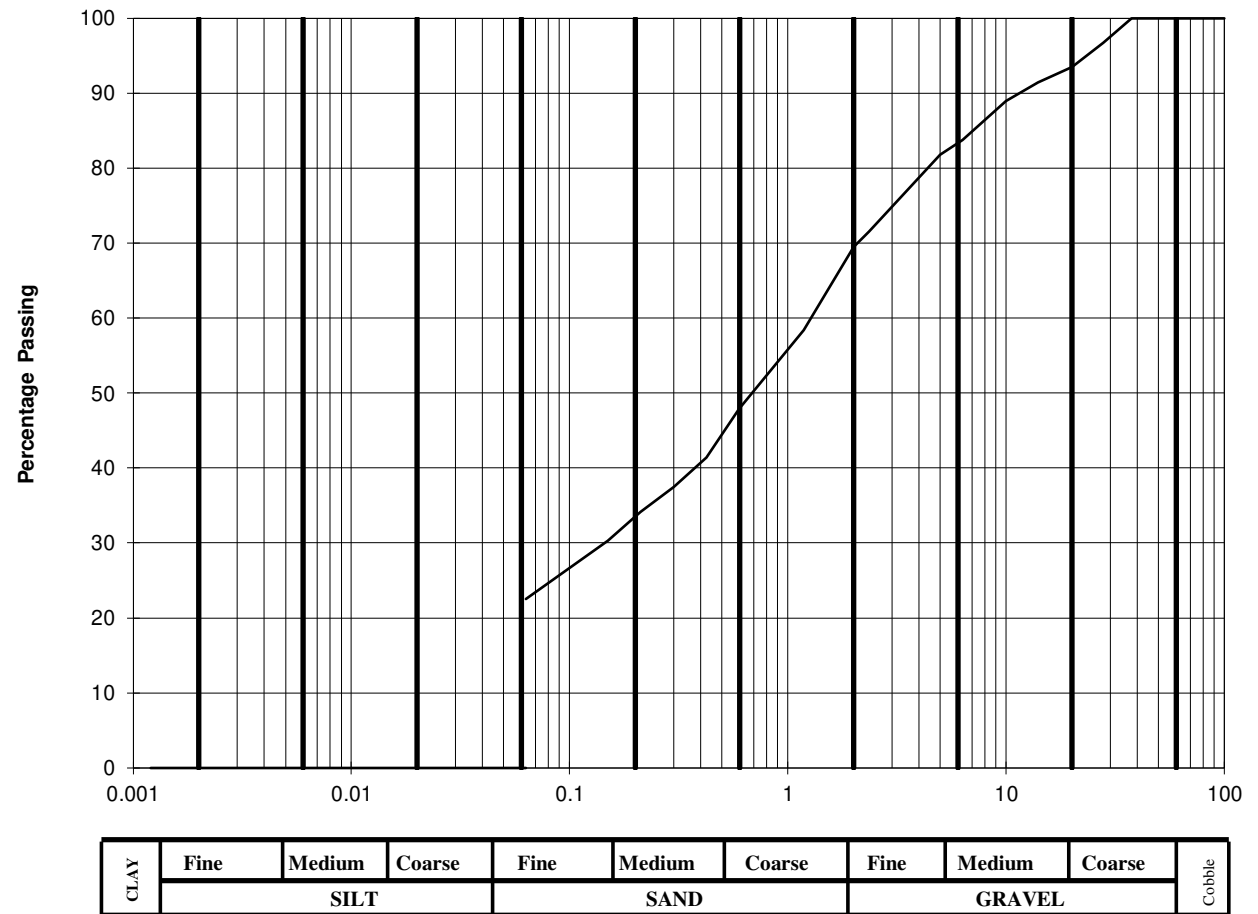
Lab. No :	25/1546
Sample No :	DM05

Hole ID :	TP 02
Depth, m :	1.00

Material description :	silty gravelly SAND
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	96.7		
20	93.5		
14	91.4		
10	88.9		
6.3	83.7		
5.0	81.8		
2.36	71.5		
2.00	69.5		
1.18	58.4		
0.600	47.9		
0.425	41.4		
0.300	37.5		
0.212	34.1		
0.150	30.3		
0.063	23		

Cobbles, %	0
Gravel, %	31
Sand, %	47
Clay / Silt, %	23



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

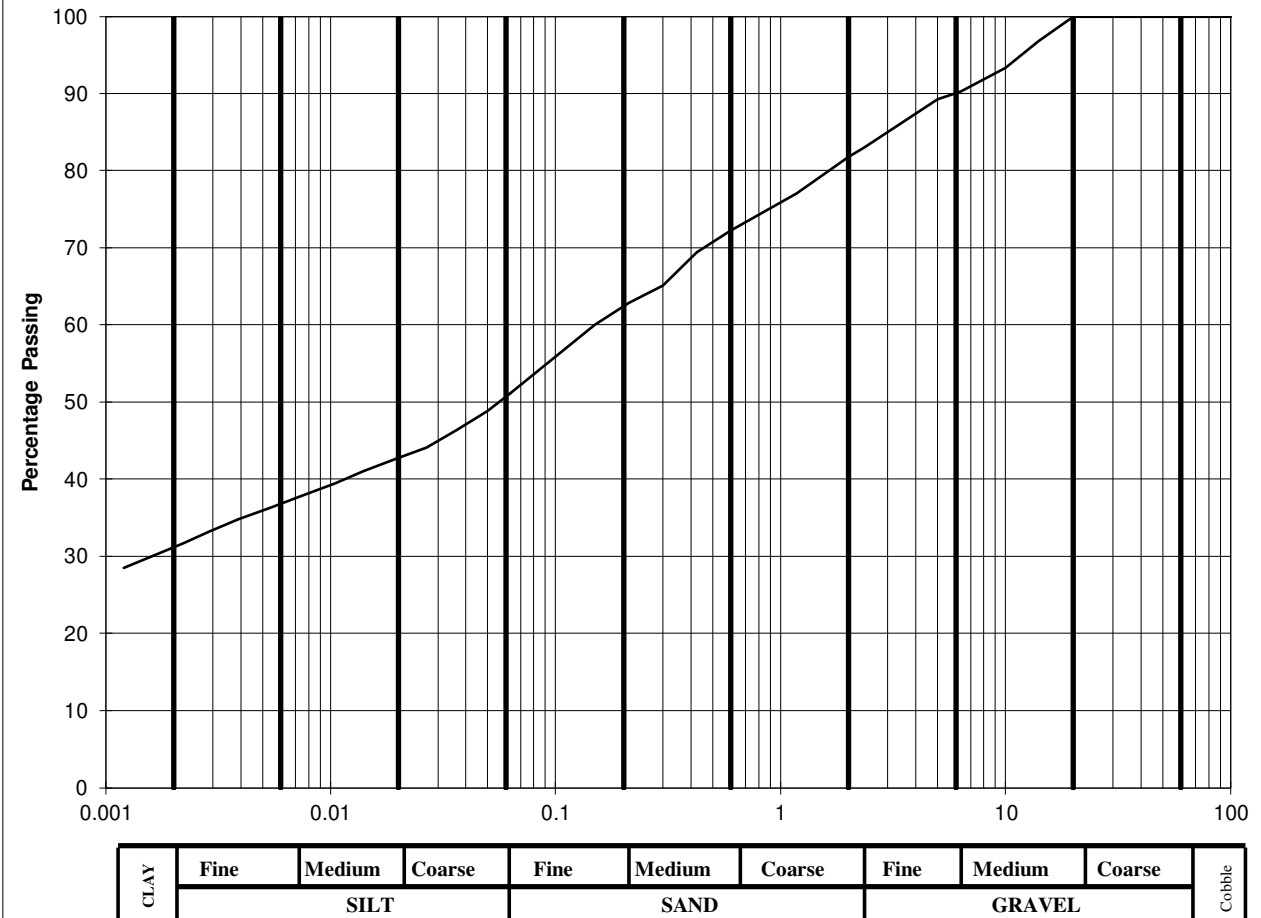
Lab. No :	25/1547
Sample No :	DM08

Hole ID :	TP 03
Depth, m :	1.00

Material description :	sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	51
90	100	0.0200	43
75	100	0.0060	36
63	100	0.0020	32
50	100		
37.5	100		
28	100		
20	100		
14	96.8		
10	93.3		
6.3	90.2		
5.0	89.2		
2.36	83		
2.00	81.8		
1.18	77		
0.600	72.2		
0.425	69.4		
0.300	65.1		
0.212	62.8		
0.150	60		
0.063	51		

Cobbles, %	0
Gravel, %	18
Sand, %	31
Silt, %	19
Clay, %	32



Client :	Tipperary County Council
Project :	Donohill, Tipperary

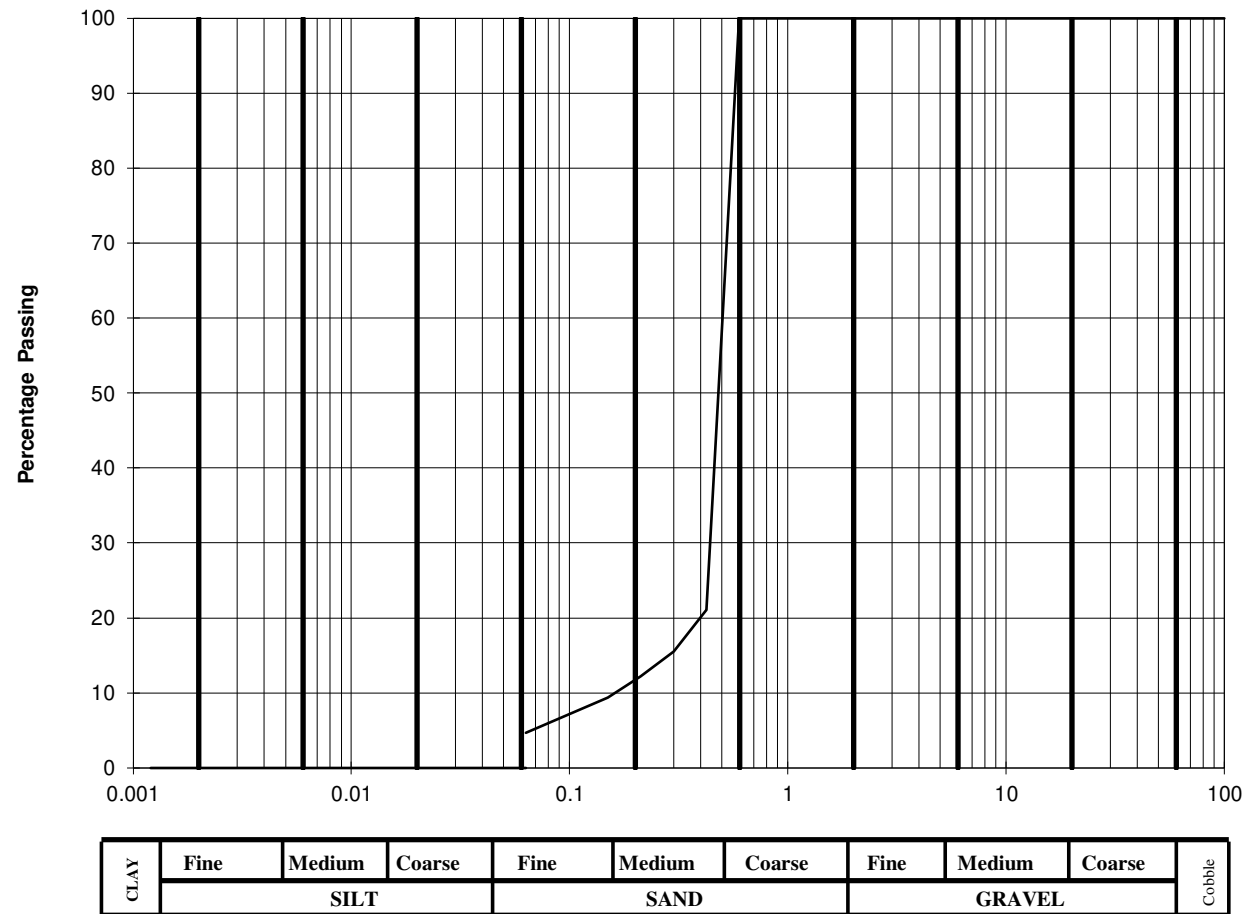
Lab. No :	24/1548
Sample No :	DM11

Hole ID :	SA 02
Depth, m :	1.00

Material description :	slightly sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5.0	100		
2.36	100		
2.00	100		
1.18	100		
0.600	100		
0.425	21.1		
0.300	15.5		
0.212	12.2		
0.150	9.4		
0.063	5		

Cobbles, %	0
Gravel, %	0
Sand, %	95
Clay / Silt, %	5



Engineer :	Tipperary County Council
Project :	Donohill, Tipperary

Lab. No :	25/1549
Sample No :	DM12

Hole ID :	SA 02
Depth, m :	2.00

Material description :	silty SAND
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

California Bearing Ratio (CBR) In accordance with BS1377: Part 4: Method 7

Client	Tipperary County Council
Site	Donohill, Tipperary
S.I. File No	6571 / 25
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	24th October 2025

CBR No	Depth (mBGL)	Sample No	Lab Ref No.	Sample Type	Moisture Content (%)	CBR Value (%)	Remarks
TP01	1.00	DM02	25/1545	ICBR	12.9	7.6	
SA02	1.00	DM11	25/1548	ICBR	0.3	1.9	

Chemical Testing
In accordance with BS 1377: Part 3

Client	Tipperary County Council
Site	Donohill, Tipperary
S.I. File No	6571 / 25
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	24th October 2025

Hole Id	Depth (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) %	Acid Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) g/L	Acid Soluble Sulphate Content (2:1 Water-soil extract) (SO ₃) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm
BH02	1.00	DMc01	25/1538	8.04	0.123	0.107				87.7
BH04	1.00	BH21	25/1540	7.88	0.119	0.097				81.4
BH06	1.00	BH11	25/1542	8.08	0.124	0.067				53.9
TP01	1.00	DM02	25/1545	8.04	0.123	0.095				77.3
SA02	1.00	DM11	25/1548	7.51	0.123	0.101				81.8

Appendix 5

Environmental Laboratory Test Results



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

Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Site Investigations Ltd
The Grange
Carhugar
12th Lock Road
Lucan
Co. Dublin

Attention: Stephen Letch

CERTIFICATE OF ANALYSIS

Date of report Generation:	04 November 2025
Customer:	Site Investigations Ltd
Sample Delivery Group (SDG):	251024-97
Your Reference:	6571
Location:	Donohill, Co.Tipperary
Report No:	782148
Order Number:	32/B/25

We received 1 sample on Friday October 24, 2025 and 1 of these samples were scheduled for analysis which was completed on Tuesday November 04, 2025. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

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

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

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

Approved By:

Justin Keeton
Business Unit Leader - Land





CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
32345547	TP 02		0.50 - 0.50	22/10/2025

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

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

Lab Sample No(s)

32345547

Customer
Sample Reference

TP 02

AGS Reference

Depth (m)

0.50 - 0.50

Container

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

Sample Type

S S S

Anions by Kone (w)

All

NDPs: 0
Tests: 1

X

Asbestos ID in Solid Samples

All

NDPs: 0
Tests: 1

X

CEN Readings

All

NDPs: 0
Tests: 1

X

Chromium III

All

NDPs: 0
Tests: 1

X

Coronene

All

NDPs: 0
Tests: 1

X

Dissolved Metals by ICP-MS

All

NDPs: 0
Tests: 1

X

Dissolved Organic/Inorganic Carbon

All

NDPs: 0
Tests: 1

X

EPH by GCxGC-FID

All

NDPs: 0
Tests: 1

X

EPH CWG GC (S)

All

NDPs: 0
Tests: 1

X

Fluoride

All

NDPs: 0
Tests: 1

X

GRO by GC-FID (S)

All

NDPs: 0
Tests: 1

X

Hexavalent Chromium (s)

All

NDPs: 0
Tests: 1

X

Loss on Ignition in soils

All

NDPs: 0
Tests: 1

X

Mercury Dissolved

All

NDPs: 0
Tests: 1

X

Metals in solid samples by OES

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

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

Lab Sample No(s)

32345547

Customer
Sample Reference

TP 02

AGS Reference

Depth (m)

0.50 - 0.50

Container

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

Sample Type

S S S

PAH 16 & 17 Calc

All

NDPs: 0
Tests: 1

X

PAH by GCMS

All

NDPs: 0
Tests: 1

X

PCBs by GCMS

All

NDPs: 0
Tests: 1

X

pH

All

NDPs: 0
Tests: 1

X

pH Value of Filtered Water

All

NDPs: 0
Tests: 1

X

Phenols by HPLC (W)

All

NDPs: 0
Tests: 1

X

Sample description

All

NDPs: 0
Tests: 1

X

Total Organic Carbon

All

NDPs: 0
Tests: 1

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 1

X

VOC MS (S)

All

NDPs: 0
Tests: 1

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Sample Descriptions

Grain Sizes

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

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
32345547	TP 02	0.50 - 0.50	Dark Brown	Sandy Loam	Stones	Vegetation

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

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

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Results Legend		Customer Sample Ref.	TP 02				
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery *** 6.2 FTAB (see appendix) 1-4**@Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 22/10/2025 24/10/2025 251024-97 32345547				
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	16				
Loss on ignition	<0.7 %	TM018	3.8				
			M				
Organic Carbon, Total	<0.2 %	TM132	1.7				
			M				
pH	1 pH Units	TM133	8.18				
			M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6				
			M				
PCB congener 28	<3 µg/kg	TM168	<3				
			M				
PCB congener 52	<3 µg/kg	TM168	<3				
			M				
PCB congener 101	<3 µg/kg	TM168	<3				
			M				
PCB congener 118	<3 µg/kg	TM168	<3				
			M				
PCB congener 138	<3 µg/kg	TM168	<3				
			M				
PCB congener 153	<3 µg/kg	TM168	<3				
			M				
PCB congener 180	<3 µg/kg	TM168	<3				
			M				
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21				
Chromium, Trivalent	<0.9 mg/kg	TM181	8.62				
Antimony	<0.6 mg/kg	TM181	1.41				
			#				
Arsenic	<0.6 mg/kg	TM181	14.9				
			M				
Barium	<0.6 mg/kg	TM181	88.5				
			#				
Cadmium	<0.02 mg/kg	TM181	0.464				
			M				
Chromium	<0.9 mg/kg	TM181	8.62				
			M				
Copper	<1.4 mg/kg	TM181	50.8				
			M				
Lead	<0.7 mg/kg	TM181	38.5				
			M				
Mercury	<0.1 mg/kg	TM181	<0.1				
			M				
Molybdenum	<0.1 mg/kg	TM181	0.204				
			#				
Nickel	<0.2 mg/kg	TM181	23.4				
			M				
Selenium	<1 mg/kg	TM181	<1				
			#				
Zinc	<1.9 mg/kg	TM181	143				
			M				
PAH total 17 (inclusive of Coronene)	<1 mg/kg	TM410	1.34				
Coronene	<200 µg/kg	TM410	<200				
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	<5				



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

TPH CWG (S)

Results Legend		Customer Sample Ref.	TP 02				
# ISO17025 accredited. M mCERTS accredited. aq Aqueous / settled sample. diss.filter Dissolved / filtered sample. tot.unfiltTotal / unfiltered sample. * Subcontracted - refer to subcontractor report for accreditation status. ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery *** 6.2 FTAB (see appendix) 1-4**@Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50 - 0.50 Soil/Solid (S) 22/10/2025 24/10/2025 251024-97 32345547				
Component	LOD/Units	Method					
GRO Surrogate % recovery**	%	TM089	100				
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089	<10				
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089	<10				
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089	<10				
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	#			
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	#			
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000	#			
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414	7870	#			
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414	<1000				
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414	8150				
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414	21900				
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089	<10				
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089	<10				
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089	<10				
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	#			
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000	#			
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414	1820	#			
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414	10500	#			
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000				
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414	<1000				
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414	13700				
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414	21900				
GRO >C5-C6 (HS_1D)	<20 µg/kg	TM089	<20				
GRO >C6-C7 (HS_1D)	<20 µg/kg	TM089	<20				
GRO >C7-C8 (HS_1D)	<20 µg/kg	TM089	<20				
GRO >C8-C10 (HS_1D)	<20 µg/kg	TM089	<20				
GRO >C10-C12 (HS_1D)	<20 µg/kg	TM089	<20				
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089	<50				
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089	<50				
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089	<20				



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.

1-5&+\$\$@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref.	TP 02	28/10/2025	Agnieszka Chelmowska	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Depth (m)	0.50 - 0.50										
Sample Type	SOLID										
Date Sampled	22/10/2025 00:00:00										
Date Received	24/10/2025 11:15:00										
SDG	251024-97										
Original Sample Method Number	32345547 TM048										



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	
Mass Sample taken (kg)	0.108
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location	Donohill, Co.Tipperary
Natural Moisture Content (%)	19.9
Dry Matter Content (%)	83.4

Case	
SDG	251024-97
Lab Sample Number(s)	32345547
Sampled Date	22-Oct-2025
Customer Sample Ref.	TP 02
Depth (m)	0.50 - 0.50

Landfill Waste Acceptance
Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.7
Loss on Ignition (%)	3.8
Sum of BTEX (mg/kg)	<0.007
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	1.34
pH (pH Units)	8.18
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00254	<0.0005	0.0254	<0.005	0.5	2	25
Barium	0.0167	<0.0002	0.167	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.0087	<0.0003	0.087	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000149	<0.00001	0.000149	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.0016	<0.0004	0.016	<0.004	0.4	10	40
Lead	0.00196	<0.0002	0.0196	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00557	<0.001	0.0557	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	90.9	<10	909	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.56	<3	65.6	<30	500	800	1000

Leach Test Information

Date Prepared	25-Oct-2025
pH (pH Units)	8.38
Conductivity (µS/cm)	119
Volume Leachant (Litres)	0.882

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

Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C). Prepared leachates do not hold ISO17025 accreditation.

Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

04/11/2025 17:19:54

17:19:47 04/11/2025



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Table of Results - Appendix

Method No	Description
TM048	Identification of Asbestos in Bulk Material
TM104	Determination of Fluoride using the Kone Analyser
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	The determination of PAH in soil samples by GC-MS
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
PM024	Soil preparation including homogenisation, moisture, screens of soils for Asbestos Containing Material
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 251024-97
Client Ref.: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Test Completion Dates

Lab Sample No(s)	32345547
Customer Sample Ref.	TP 02
AGS Ref.	
Depth	0.50 - 0.50
Type	Soil/Solid (S)

Anions by Kone (w)	28-Oct-2025
Asbestos ID in Solid Samples	28-Oct-2025
CEN 10:1 Leachate (1 Stage)	25-Oct-2025
CEN Readings	30-Oct-2025
Chromium III	30-Oct-2025
Coronene	29-Oct-2025
Dissolved Metals by ICP-MS	30-Oct-2025
Dissolved Organic/Inorganic Carbon	28-Oct-2025
EPH by GCxGC-FID	29-Oct-2025
EPH CWG GC (S)	29-Oct-2025
Fluoride	28-Oct-2025
GRO by GC-FID (S)	28-Oct-2025
Hexavalent Chromium (s)	28-Oct-2025
Loss on Ignition in soils	30-Oct-2025
Mercury Dissolved	30-Oct-2025
Metals in solid samples by OES	30-Oct-2025
Moisture at 105C	25-Oct-2025
PAH 16 & 17 Calc	04-Nov-2025
PAH by GCMS	04-Nov-2025
PCBs by GCMS	29-Oct-2025
pH	26-Oct-2025
pH Value of Filtered Water	28-Oct-2025
Phenols by HPLC (W)	30-Oct-2025
Sample description	25-Oct-2025
Total Organic Carbon	30-Oct-2025
TPH CWG GC (S)	29-Oct-2025
VOC MS (S)	30-Oct-2025



CERTIFICATE OF ANALYSIS

SDG: 251024-97
Client Ref: 6571

Report Number: 782148
Location: Donohill, Co.Tipperary

Superseded Report:

Appendix

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

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

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

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

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

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

7. Results relate only to the items tested.

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

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

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

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

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

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

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

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

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

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

General

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

19. Sample Deviations

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

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

20. Asbestos

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

If during the search of the two 'pinch' samples by PLM only 1 or 2 fibres or fibre bundles are seen and identified as asbestos, the term 'trace asbestos identified' is reported.

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

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

Respirable Fibres

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

Potentially respirable fibres are identified by using a Phase Contrast Microscope.

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

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

21. 6:2 FTAB

Recovery of 6:2 FTAB in the quality control samples has been observed to be <50% of the target value. Please note the 6:2 FTAB result is supplied as indicative only.

Appendix 6

Waste Classification Report



Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



SH07W-MC85X-W7Z8Z

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in **pale yellow**.

Report is invalid if pages are removed.

Job name

6571

Description/Comments

Client: Tipperary County Council
Engineer: Hassett Leyden & Associates

Project

Residential Development

Site

Donohill, Co. Tipperary

Classified by

Name: **Stephen Letch**
Date: **04 Nov 2025 17:34 GMT**
Telephone: **00353 86817 9449**
Company: **Site Investigations Ltd**
The Grange
12th Lock Road
Lucan
K78 F598

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

Course	Date
Hazardous Waste Classification	09 Oct 2019
Most recent 3 year Refresher	02 Dec 2025 *

* training course booked

Purpose of classification

2 - Material Characterisation

Address of the waste

Cuil Greine, Donohill, Kilmucklin, County Tipperary, The Municipal District of Cahir — Cashel, Ireland Post Code E34 HK70

Description of industry/producer giving rise to the waste

Site Investigation

Description of the specific process, sub-process and/or activity that created the waste

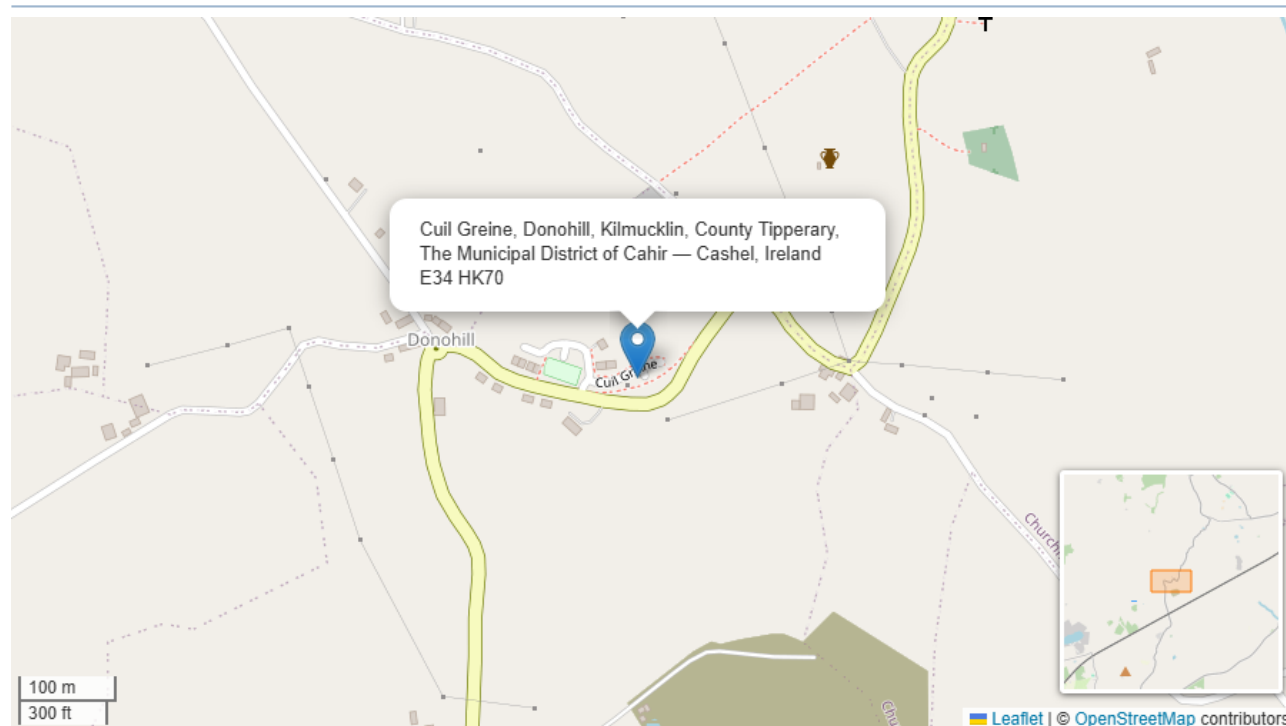
Soils recovered for environmental testing

Description of the waste

Natural soils



Waste Location



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	TP02-0.50	0.50	Non Hazardous		Pass	Pass	5

Related documents

#	Name	Description
1	251024-97.hwol	ALS Hawarden .hwol file used to populate the Job
2	Rilta Suite NEW	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Stephen Letch

Created date: 04 Nov 2025 17:34 GMT

Appendices	Page
Appendix A: Classifier defined and non EU CLP determinands	9
Appendix B: Rationale for selection of metal species	11
Appendix C: Version	12



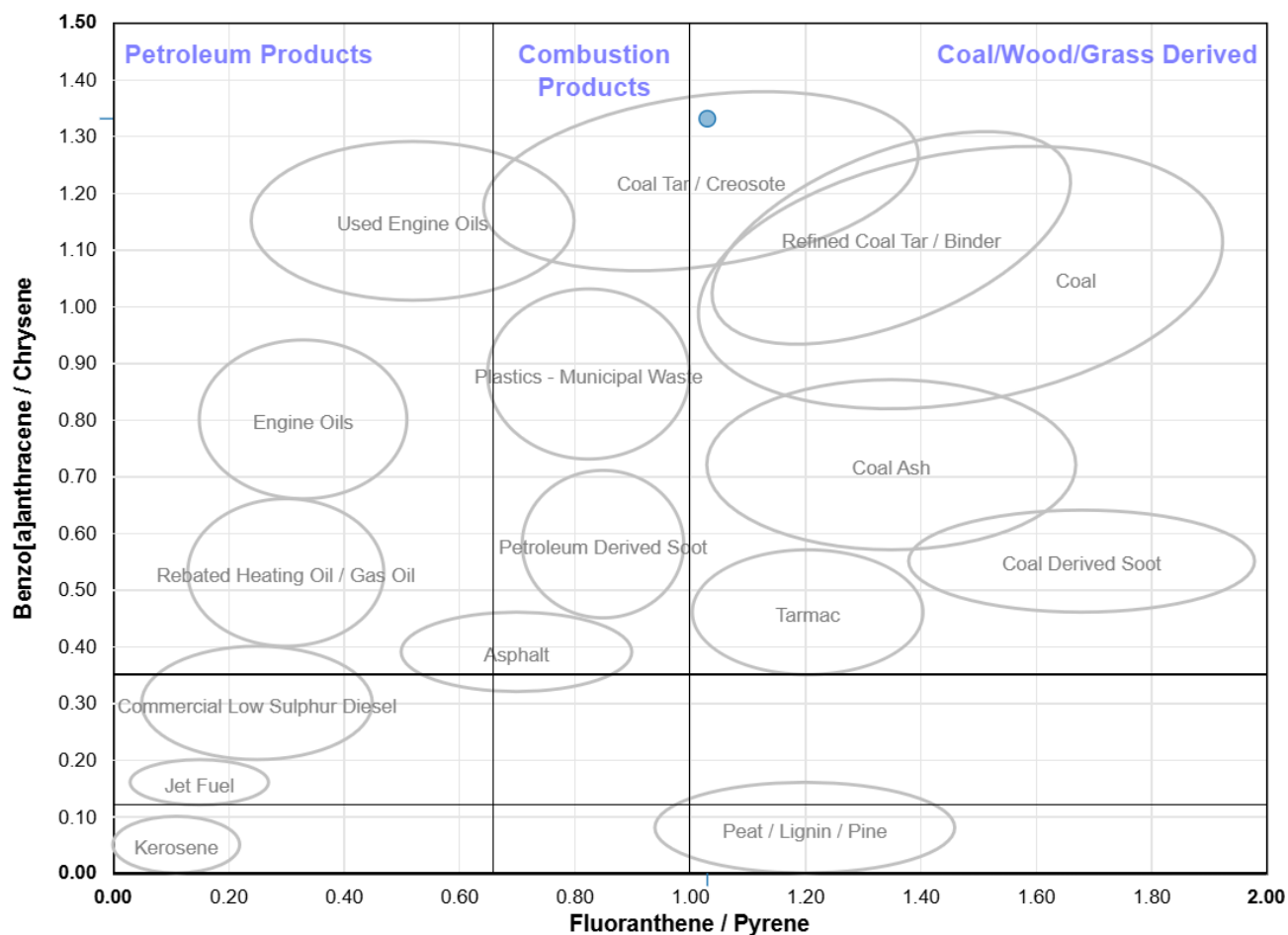
PAH Double Ratio Plots

Disclaimer

The domains, oval areas and the plotted points are **indicators only** and must be combined with other lines of evidence to form conclusions. Samples marked with an empty circle are not plotted as they fall outside of the graph's boundaries.

Credits

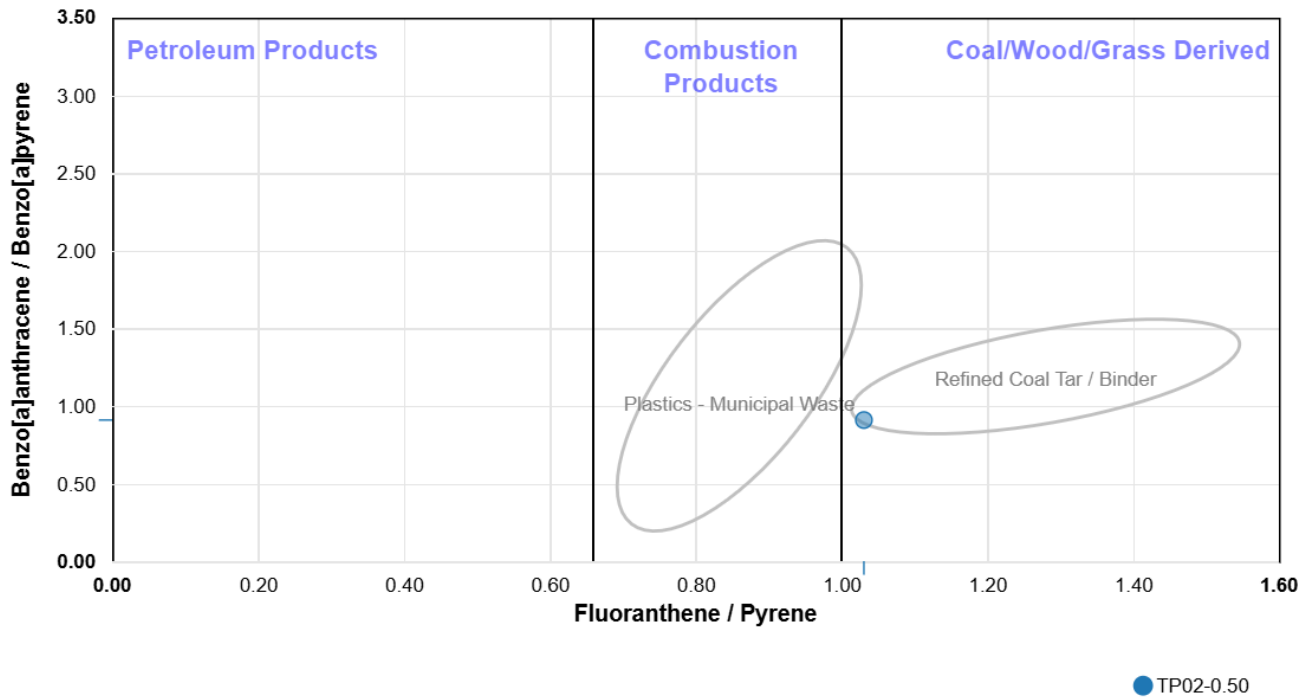
The domains and the horizontal and vertical lines are derived from Yunker et al. 2002 (Organic Geochemistry 33, 489-515)



● TP02-0.50

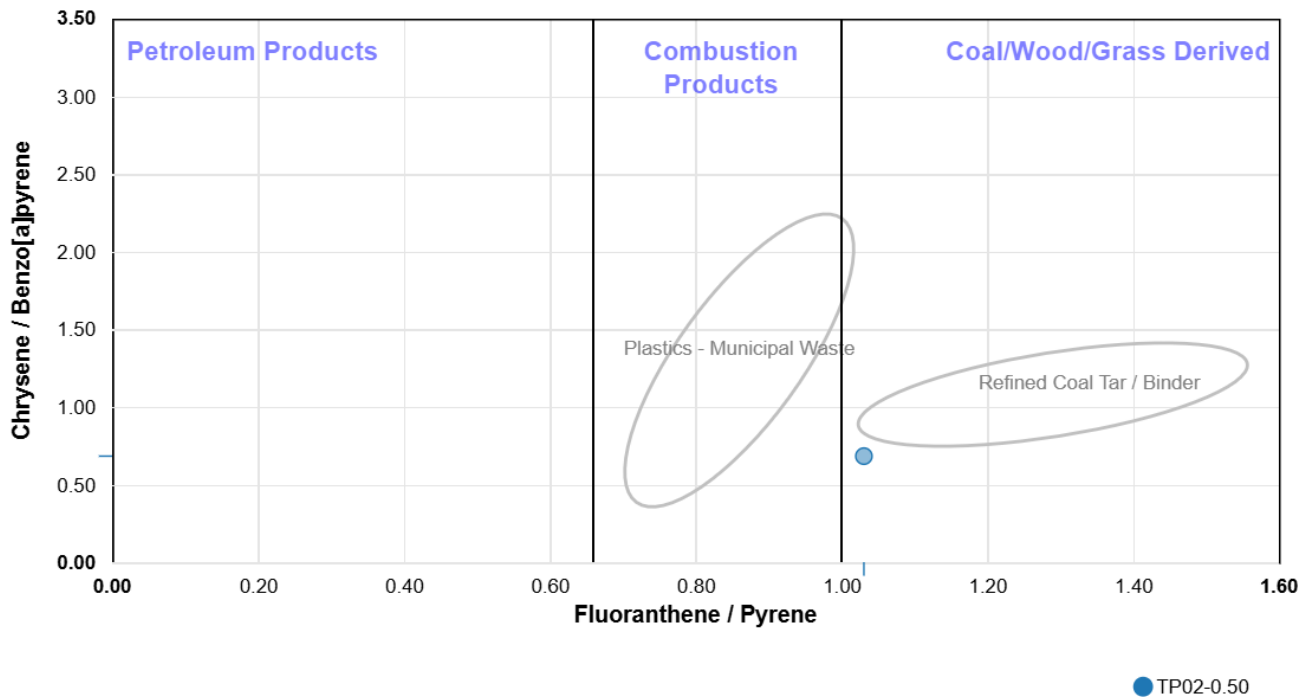
Credits for the oval areas and labels

HazWasteOnline, 2023; Jones Environmental Forensics, 2014



Credits for the oval areas and labels

HazWasteOnline, 2023



Credits for the oval areas and labels

HazWasteOnline, 2023



Classification of sample: TP02-0.50

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name: **TP02-0.50** LoW Code: Chapter: **17: Construction and Demolition Wastes (including excavated soil from contaminated sites)**
Sample Depth: **0.50 m** Entry: **17 05 04 (Soil and stones other than those mentioned in 17 05 03)**
Moisture content: **16%**
(wet weight correction)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				21.9 mg/kg		18.396 mg/kg	0.00184 %	✓	
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				☑					
3	antimony { antimony compounds, with the exception of the tetroxide (Sb ₂ O ₄), pentoxide (Sb ₂ O ₅), trisulphide (Sb ₂ S ₃), pentasulphide (Sb ₂ S ₅) and those specified elsewhere in this Annex }			1	1.41 mg/kg		1.184 mg/kg	0.000118 %	✓	
	051-003-00-9									
4	arsenic { arsenic compounds, with the exception of those specified elsewhere in this Annex }			1	14.9 mg/kg		12.516 mg/kg	0.00125 %	✓	
	033-002-00-5									
5	barium { barium oxide }				88.5 mg/kg	1.117	83.001 mg/kg	0.0083 %	✓	
		215-127-9	1304-28-5							
6	cadmium { cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex }			1	0.464 mg/kg		0.39 mg/kg	0.000039 %	✓	
	048-001-00-5									
7	copper { dicopper oxide; copper (I) oxide }				50.8 mg/kg	1.126	48.044 mg/kg	0.0048 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	38.5 mg/kg		32.34 mg/kg	0.00323 %	✓	
	082-001-00-6									
9	mercury { mercury }				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	080-001-00-0	231-106-7	7439-97-6							
10	molybdenum { molybdenum(VI) oxide }				0.204 mg/kg	1.5	0.257 mg/kg	0.0000257 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel(II) oxide (nickel monoxide) }				23.4 mg/kg	1.273	25.014 mg/kg	0.0025 %	✓	
	028-003-00-2	215-215-7 [1] 234-323-5 [2] - [3]	1313-99-1 [1] 11099-02-8 [2] 34492-97-2 [3]							



#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	EU CLP index number	EC Number	CAS Number								
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %			<LOD
	034-002-00-8										
13	zinc { zinc oxide }				143 mg/kg	1.245	149.515 mg/kg	0.015 %	✓		
	030-013-00-7	215-222-5	1314-13-2								
14	chromium in Cr(III) compounds { chromium(III) oxide (worst case) }				8.62 mg/kg	1.462	10.583 mg/kg	0.00106 %	✓		
		215-160-9	1308-38-9								
15	chromium in Cr(VI) compounds { chromium(VI) oxide }				<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %			<LOD
	024-001-00-0	215-607-8	1333-82-0								
16	naphthalene				<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
17	acenaphthylene				<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %			<LOD
		205-917-1	208-96-8								
18	acenaphthene				<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %			<LOD
		201-469-6	83-32-9								
19	fluorene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %			<LOD
		201-695-5	86-73-7								
20	phenanthrene				0.0332 mg/kg		0.0279 mg/kg	0.00000279 %	✓		
		201-581-5	85-01-8								
21	anthracene				<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %			<LOD
		204-371-1	120-12-7								
22	fluoranthene				0.2 mg/kg		0.168 mg/kg	0.0000168 %	✓		
		205-912-4	206-44-0								
23	pyrene				0.194 mg/kg		0.163 mg/kg	0.0000163 %	✓		
		204-927-3	129-00-0								
24	benzo[a]anthracene				0.141 mg/kg		0.118 mg/kg	0.0000118 %	✓		
	601-033-00-9	200-280-6	56-55-3								
25	chrysene				0.106 mg/kg		0.089 mg/kg	0.0000089 %	✓		
	601-048-00-0	205-923-4	218-01-9								
26	benzo[b]fluoranthene				0.214 mg/kg		0.18 mg/kg	0.000018 %	✓		
	601-034-00-4	205-911-9	205-99-2								
27	benzo[k]fluoranthene				0.0653 mg/kg		0.0549 mg/kg	0.00000549 %	✓		
	601-036-00-5	205-916-6	207-08-9								
28	benzo[a]pyrene; benzo[def]chrysene				0.155 mg/kg		0.13 mg/kg	0.000013 %	✓		
	601-032-00-3	200-028-5	50-32-8								
29	indeno[123-cd]pyrene				0.12 mg/kg		0.101 mg/kg	0.0000101 %	✓		
		205-893-2	193-39-5								
30	dibenz[a,h]anthracene				<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
31	benzo[ghi]perylene				0.109 mg/kg		0.0916 mg/kg	0.00000916 %	✓		
		205-883-8	191-24-2								
32	polychlorobiphenyls; PCB				<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %			<LOD
	602-039-00-4	215-648-1	1336-36-3								
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.0005 mg/kg		<0.0005 mg/kg	<0.00000005 %			<LOD
	603-181-00-X	216-653-1	1634-04-4								
34	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
35	toluene				0.0015 mg/kg		0.0013 mg/kg	0.000000132 %	✓		
	601-021-00-3	203-625-9	108-88-3								
36	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
37	coronene				<0.2 mg/kg		<0.2 mg/kg	<0.00002 %			<LOD
		205-881-7	191-07-1								
38	pH		PH		8.18 pH		8.18 pH	8.18 pH			



#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		601-022-00-9	202-422-2 [1]	95-47-6 [1]							
			203-396-5 [2]	106-42-3 [2]							
			203-576-3 [3]	108-38-3 [3]							
			215-535-7 [4]	1330-20-7 [4]							
40	■	asbestos fibres detected (Yes/No)				No					
			ACM_FIBRES								
41	■	< 2% non-natural materials (Yes/No)				Yes					
			NONNAT_MAT								
Total:									0.0382 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
🧪	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: HP 3 can be discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 1.32e-07%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00184%)



WAC results for sample: TP02-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"

The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample **PASSES** the Inert (Inert waste landfill) criteria.

The sample **PASSES** the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis			Landfill Waste Acceptance Criteria Limits	
#	Determinand	User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	% 1.7	3	-
2	LOI (loss on ignition)	% 3.8	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg <0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg <0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg <5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg 1.34	100	-
7	pH	pH 8.18	-	-
8	ANC (acid neutralisation capacity)	mol/kg	-	-
Eluate Analysis 10:1				
9	arsenic	mg/kg 0.0254	0.5	2
10	barium	mg/kg 0.167	20	100
11	cadmium	mg/kg <0.0008	0.04	1
12	chromium	mg/kg <0.01	0.5	10
13	copper	mg/kg 0.087	2	50
14	mercury	mg/kg 0.0001	0.01	0.2
15	molybdenum	mg/kg <0.03	0.5	10
16	nickel	mg/kg 0.016	0.4	10
17	lead	mg/kg 0.0196	0.5	10
18	antimony	mg/kg <0.01	0.06	0.7
19	selenium	mg/kg <0.01	0.1	0.5
20	zinc	mg/kg 0.0557	4	50
21	chloride	mg/kg <20	800	15,000
22	fluoride	mg/kg <5	10	150
23	sulphate	mg/kg <20	1,000	20,000
24	phenol index	mg/kg <0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg 65.6	500	800
26	TDS (total dissolved solids)	mg/kg 909	4,000	60,000

Key

User supplied data



Appendix A: Classifier defined and non EU CLP determinands

• **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Unknown Oil

Hazard statements taken from WM3 1st Edition 2015

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

• **confirm TPH has NOT arisen from diesel or petrol**

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• **arsenic compounds, with the exception of those specified elsewhere in this Annex**

EU CLP index number: 033-002-00-5

Description/Comments: Worst Case: IARC considers arsenic compounds Group 1; Carcinogenic to humans

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

• **barium oxide** (EC Number: 215-127-9, CAS Number: 1304-28-5)

Description/Comments: Data from ECHA's C&L Inventory Database, Sigma Aldrich SDS dated 6/2/20

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/88825>

Data source date: 02 Apr 2020

Hazard Statements: Acute Tox. 3; H301 , Skin Corr. 1B; H314 , Eye Dam. 1; H318 , Acute Tox. 1; H332

• **cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex**

EU CLP index number: 048-001-00-5

Description/Comments: Worst Case: IARC considers cadmium compounds Group 1; Carcinogenic to humans

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

• **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

EU CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

• **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

• **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315



■ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

■ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

■ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

■ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

■ **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

EU CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans;

POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Additional Hazard Statement(s): Carc. 1A; H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

EU CLP index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000



• **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.

Data source: <http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>

Data source date: 16 Jun 2014

Hazard Statements: STOT SE 2; H371

• **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

• **asbestos fibres detected (Yes/No)** (CAS Number: ACM_FIBRES)

Description/Comments: not classified, information only

Data source: N/A

Data source date: 15 Jan 2020

Hazard Statements: None.

• **< 2% non-natural materials (Yes/No)** (CAS Number: NONNAT_MAT)

Description/Comments: not classified, information only

anthropogenic or man-made substances such as rubble, concrete, bricks, metal and bitumen that are non-natural to the environment from which the material was extracted

Data source: N/A

Data source date: 15 Jan 2020

Hazard Statements: None.

Appendix B: Rationale for selection of metal species

antimony {antimony compounds, with the exception of the tetroxide (Sb₂O₄), pentoxide (Sb₂O₅), trisulphide (Sb₂S₃), pentasulphide (Sb₂S₅) and those specified elsewhere in this Annex}

Worst Case Scenario.

arsenic {arsenic compounds, with the exception of those specified elsewhere in this Annex}

Chromium VI at limits of detection. Arsenic compounds used as the next most hazardous species. No chromate present.

barium {barium oxide}

Chromium VI at limits of detection. Barium oxide used as the next most hazardous species. No chromate present.

cadmium {cadmium compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex}

Chromium VII at limits of detection. Cadmium compounds used as the next most hazardous species. No chromate present.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

mercury {mercury}

Worst case CLP species based on hazard statements/molecular weight

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel(II) oxide (nickel monoxide)}

Chromium VI at limits of detection. Nickel oxide used as the next most hazardous species. No chromate present.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

zinc {zinc oxide}

Chromium VI at limits of detection. Zinc oxide used as the next most hazardous species. No chromate present.



chromium in Cr(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

chromium in Cr(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments.

Appendix C: Version

HazWasteOnline Classification Engine: **EU WM3 1st Edition v1.1.NI using the EU LoW**

HazWasteOnline Classification Engine Version: 2025.303.6844.12384 (30 Oct 2025)

HazWasteOnline Database: 2025.303.6844.12384 (30 Oct 2025)

This classification utilises the following guidance and legislation:

WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

17th ATP - Regulation (EU) 2021/849 of 11 March 2021

18th ATP - Regulation (EU) 2022/692 of 16 February 2022

POPs Amendment 2022 - Regulation (EU) 2022/2400 of 23 November 2022

19th ATP - Regulation (EU) 2023/1434 of 25 April 2023

20th ATP - Regulation (EU) 2023/1435 of 2 May 2023

21st ATP - Regulation (EU) 2024/197 of 19 October 2023

22nd ATP - Regulation (EU) 2024/2564 of 19th June 2024

23rd ATP - Regulation (EU) 2025/1222 of 2nd April 2025

Appendix 7

Soils Recovery Facility Report



HUF3T-ALS0Z-O1JTD

Soil Recovery Sites Screening Report

Job name

6571

Description/Comments

Client: Tipperary County Council
Engineer: Hassett Leyden & Associates

Project

Residential Development

Site

Donohill, Co. Tipperary

Classified by

Name: **Stephen Letch**
Date: **04 Nov 2025 17:34 GMT**
Telephone: **00353 86817 9449**
Company: **Site Investigations Ltd**
The Grange
12th Lock Road
Lucan
K78 F598

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

-

Course

Hazardous Waste Classification
Most recent 3 year Refresher

Date

09 Oct 2019
02 Dec 2025 *

* training course booked

Purpose of classification

2 - Material Characterisation

Address of the waste

Cuil Greine, Donohill, Kilmucklin, County Tipperary, The Municipal District of Cahir — Cashel, Ireland

Post Code **E34 HK70**

Description of industry/producer giving rise to the waste

Site Investigation

Description of the specific process, sub-process and/or activity that created the waste

Soils recovered for environmental testing

Description of the waste

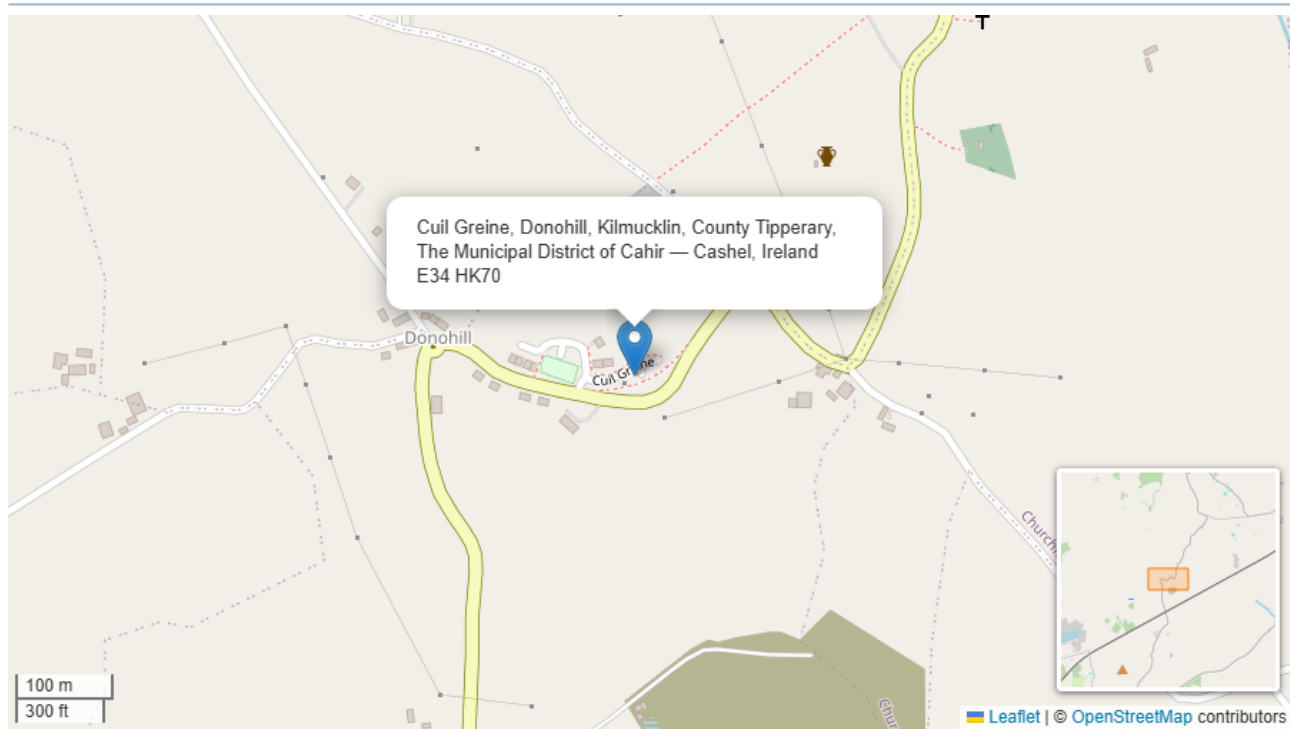
Natural soils

Screening Summary

#	Sample name	Depth [m]	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	Domain 6	Domain 7	Page
1	TP02-0.50	0.50	⚠ Fail	⚠ Fail	⚠ Fail	⚠ Fail	⚠ Fail	⚠ Fail	⚠ Fail	3



Waste Location





Soil Recovery Sites Screening results for sample: TP02-0.50

 **Sample "TP02-0.50" fails the "Domain 1" limits**

#	Determinand		User entered data	Domain 1 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	15.6	mg/kg
3	cadmium	mg/kg	0.464	1.5	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	51.5	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	51.2	mg/kg
7	mercury	mg/kg	<0.1	0.254	mg/kg
8	nickel	mg/kg	23.4	47.8	mg/kg
9	lead	mg/kg	38.5	48.3	mg/kg
10	zinc	mg/kg	143	137	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a

 **Sample "TP02-0.50" fails the "Domain 2" limits**

#	Determinand		User entered data	Domain 2 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	24.9	mg/kg
3	cadmium	mg/kg	0.464	3.28	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	50.3	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	63.5	mg/kg
7	mercury	mg/kg	<0.1	0.36	mg/kg
8	nickel	mg/kg	23.4	61.9	mg/kg
9	lead	mg/kg	38.5	86.1	mg/kg
10	zinc	mg/kg	143	197	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a



Key

	User supplied data
	Value above the screening limit/trigger level



 Sample "TP02-0.50" fails the "Domain 3" limits

#	Determinand		User entered data	Domain 3 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	38.1	mg/kg
3	cadmium	mg/kg	0.464	1.6	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	47.5	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	56.9	mg/kg
7	mercury	mg/kg	<0.1	0.457	mg/kg
8	nickel	mg/kg	23.4	54.4	mg/kg
9	lead	mg/kg	38.5	81.3	mg/kg
10	zinc	mg/kg	143	237	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a

 Sample "TP02-0.50" fails the "Domain 4" limits

#	Determinand		User entered data	Domain 4 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	32.3	mg/kg
3	cadmium	mg/kg	0.464	0.97	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	51.7	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	80.4	mg/kg
7	mercury	mg/kg	<0.1	0.285	mg/kg
8	nickel	mg/kg	23.4	50.3	mg/kg
9	lead	mg/kg	38.5	91.4	mg/kg
10	zinc	mg/kg	143	155	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a

Key

	User supplied data
	Value above the screening limit/trigger level



 Sample "TP02-0.50" fails the "Domain 5" limits

#	Determinand		User entered data	Domain 5 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	41.5	mg/kg
3	cadmium	mg/kg	0.464	1.42	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	73.2	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	77.6	mg/kg
7	mercury	mg/kg	<0.1	0.302	mg/kg
8	nickel	mg/kg	23.4	65.7	mg/kg
9	lead	mg/kg	38.5	109	mg/kg
10	zinc	mg/kg	143	224	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a

 Sample "TP02-0.50" fails the "Domain 6" limits

#	Determinand		User entered data	Domain 6 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	85.8	mg/kg
3	cadmium	mg/kg	0.464	2.38	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	54	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	40	mg/kg
7	mercury	mg/kg	<0.1	0.527	mg/kg
8	nickel	mg/kg	23.4	28.2	mg/kg
9	lead	mg/kg	38.5	108	mg/kg
10	zinc	mg/kg	143	168	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a

Key

	User supplied data
	Value above the screening limit/trigger level



 Sample "TP02-0.50" fails the "Domain 7" limits

#	Determinand		User entered data	Domain 7 Limit	
1	Uncontaminated soil and stone (LoW 17 05 04)	n/a	Yes	Yes	n/a
2	arsenic	mg/kg	14.9	30.9	mg/kg
3	cadmium	mg/kg	0.464	0.542	mg/kg
4	chromium in Cr(III) compounds	mg/kg	8.62	57.6	mg/kg
5	chromium in Cr(VI) compounds	mg/kg	<0.6		
6	copper	mg/kg	50.8	83.1	mg/kg
7	mercury	mg/kg	<0.1	0.262	mg/kg
8	nickel	mg/kg	23.4	35.7	mg/kg
9	lead	mg/kg	38.5	61.1	mg/kg
10	zinc	mg/kg	143	122	mg/kg
11	TOC (total organic carbon)	%	1.7	3	%
12	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	0.05	mg/kg
13	Mineral oil (C10 to C40)	mg/kg	<5	50	mg/kg
14	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	1.34	1	mg/kg
15	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	0.05	mg/kg
16	asbestos fibres detected (Yes/No)	n/a	No	No	n/a
17	< 2% non-natural materials (Yes/No)	n/a	Yes	Yes	n/a

Key

	User supplied data
	Value above the screening limit/trigger level

Screening utilises the following:

EPA Ireland: Guidance on waste acceptance criteria at authorised soil recovery facilities - January 2020

Appendix 8

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Cable Percussive Boreholes					
BH01	590403.493	643068.332	96.16	190450.949	143021.712
BH02	590423.421	643066.657	95.58	190470.882	143020.037
BH03	590453.997	643058.490	94.81	190501.464	143011.868
BH04	590405.038	643043.389	94.16	190452.495	142996.764
BH05	590423.800	643051.597	94.85	190471.261	143004.974
BH06	590441.676	643053.174	95.01	190489.141	143006.551
Trial Pits					
TP01	590404.018	643057.847	95.11	190451.475	143011.225
TP02	590421.694	643059.835	95.35	190469.154	143013.214
TP03	590449.129	643053.115	94.90	190496.595	143006.492
Soakaway Tests					
SA01	590417.044	643029.659	94.05	190464.503	142983.031
SA02	590437.905	643017.188	93.40	190485.369	142970.557

Legend Key

-  Locations By Type - CP
-  Locations By Type - IP
-  Locations By Type - TP

BH01



TP01



BH02



TP02



BH03



TP03



BH04



BH05



BH06



SA01



SA02



R497

Cuil Greine

R497

Contract No:	6571
Contract Name:	Housing Development
Location:	Cuil Griene, Donohill, Co. Tipperary
Client:	Tipperary County Council
Engineer:	Hassett Leyden & Associates
Title:	Site Plan
Scale:	1:500
Drawn By:	SL



Site Investigations Ltd
The Grange
12th Lock Road
Lucan
Co. Dublin
T: 01 6108768
e: info@siteinvestigations.ie



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20 Metres
80 Feet