

ATTACHMENT D.1

TIER 2 RISK ASSESSMENT

APPLICATION TO THE EPA FOR A CERTIFICATE OF AUTHORISATION

FORMER MUNICIPAL HISTORIC LANDFILL

RANTAVAN

MULLAGH

CO. CAVAN

Prepared By:

**Traynor Environmental Ltd
Belturbet Business Park,
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Belturbet
Co. Cavan**



JULY 2012

TIER 2

ENVIRONMENTAL RISK ASSESSMENT

OF A

FORMER MUNICIPAL HISTORIC LANDFILL

AT

RANTAVAN
MULLAGH
CO. CAVAN

Prepared By:

Traynor Environmental Ltd
Belturbet Business Park,
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In Association With

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November 2010

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1. INTRODUCTION

Cavan County Council completed an inventory and conducted a preliminary risk assessment of the unregulated historic waste disposal site at Rantavan, Mullagh, Co. Cavan in accordance with the requirements of Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008. The preliminary, or Tier 1 Assessment, followed the guidance in the Environmental Protection Agency (EPA) guidance document "Code of Practice Environmental risk Assessment for Unregulated Waste Disposal Sites (COP)", which was published in April 2007. Cavan County Council completed the Tier I Assessment of the Mullagh Landfill in September 2009, which ranked the site as being of Moderate Risk in accordance with the COP. A copy of the assessment is included in Attachment D.1. Tier 1 Risk Assessment. In October 2010, Cavan County Council appointed Traynor Environmental Ltd to undertake a Tier 2 Environmental Risk Assessment in association with the Waste Management Section of Cavan County Council.

1.1 METHODOLOGY

The Tier 2 Environmental Risk assessment, which was carried out in accordance with the guidance in the COP, included an initial review of the Tier 1 Report; review of original data sources; conducting a site inspection to ascertain an understanding of historical land use; establish the local and regional hydrological and hydrogeological conditions; confirm the presence of potentially sensitive on site receptors; and identify suitable locations for the intrusive investigation programme.

Traynor Environmental Ltd subsequently designed and implemented a site investigation programme that included:-

- Topographic Survey;
- Trial hole excavation and survey;
- Collection and analyses of waste and sub-soil samples;
- Collection and analysis of groundwater samples;
- Collection and analysis of surface water samples;
- Landfill gas monitoring;
- Ecological Assessment of Site and Q Value Rating of watercourse/drains in the vicinity of the site.

Traynor Environmental Ltd carried out the intrusive site investigation works in accordance with BS 10175:2001 Investigation of Potentially Contaminated Sites Code of Practice. The intrusive works were supervised by Traynor Environmental Ltd personnel in association with the Waste Management Section of Cavan County Council. Traynor Environmental Ltd and Cavan County Council carried out all sampling on site. The testing laboratory used was Alcontrol Laboratories who have United Kingdom Accreditation Service (UKAS) certification. A topographic survey was carried out by Alan Traynor Consulting Engineers Ltd. The Ecology assessment of the site and the Q value ratings were carried out by Noreen Mc Loughlin MSc. MIEEM on behalf of Traynor Environmental Ltd.

2. SITE DESCRIPTION

2.1 SITE LOCATION

Mullagh historic landfill is located 1.5km from Mullagh village in the townland of Rantavan on local roadway (L-7114-0).

2.2 SITE LAYOUT

The main receptor is the watercourse/drain located on the north-eastern aspect of the site which is immediate to the site boundary (refer to Drawing No. 10-198-013 and 10-198-014). Dwelling houses were noted on the northern, north eastern and south eastern aspect which ranged from 220 – 370 m from the site boundary. The dwellings in the area are serviced by Mullagh Public Water Supply with the exception of one dwelling which is serviced by a private well (approximately 340 m Southeast from the site boundary). The dwelling locations are shown in Drawing No. 10-198-001. The site is generally a half circle with a total site area of around 0.7 hectares.

The site boundaries are marked by a local road to the Southwest. The Northern, Eastern and Southern boundaries comprise of a wooden post and wire fence and watercourse. Land to the East and South is primarily open grass land of agricultural use while the land South of the site comprises of forestry and scrubland.

2.3 SURROUNDING LANDUSE

The surrounding land use is predominantly agricultural and forestry.

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NOTES



- OPEN DRAINS
- - - SITE BOUNDARY
- 250m RADIUS FROM THE SITE
- 500m RADIUS FROM THE SITE
- DWELLING HOUSE (RECEPTORS)
- ▨ BOG (RECEPTORS)
- ▨ MULLAGH LOUGH (RECEPTORS)
- PRIVATE WELL (RECEPTOR)

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PROJECT TITLE
 SITE INVESTIGATION & RISK ASSESSMENT
 OF EXISTING HISTORIC LANDFILL SITE AT
 RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE
 POTENTIAL RECEPTORS IN THE
 VICINITY OF THE SITE

SCALE	DRAWN	CHECKED	APPROVED
1:10000	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

DRAWING No.	REV.
10-198-001	

2.4 SITE HISTORY

It is understood that waste disposal began at the site in 1972. A variety of wastes may have been deposited, including Municipal Solid Waste (MSW) and Construction and Demolition (C&D) wastes. It is alleged that the site was used for dumping industrial waste. The site employed the method of dump and burn which was common at dump sites in the 1970s -1980s, and was finally closed in 1989.

2.4.1 Review of Aerial Photographs

A review of the Ordnance Survey Ireland (OSI) revealed a good selection of historical aerial photographs for the site ranging from 1888 to the present day. The following maps were used to show significant changes of usage on the site:

- Ortho 2000 - Colour aerial photography flown in July 2000 (Drawing No. 10-198-002);
- Ortho 1995 – Black and White aerial photography flown 1995 (Drawing No. 10-198-003);
- 25 inch mapping series (1:2,500) greyscale 1888-1913 (Drawing No. 10-198-004);
- 6 inch mapping series (1:10,560) greyscale 1837-1842 (Drawing No. 10-198-004).

2.4.1.1 Landfill Pre 1970s

Maps from this period show the site as a relatively low lying marsh land. This land contains rough agricultural land, probably pasture, which contrasts with the enhanced pasture and arable fields to the East of the landfill site. The maps pre 1970 (Drawing No. 10-198-004), suggests that there was no landfill present on the south side.

2.4.1.2 Landfill 1995

Tipping on the site had ceased by 1989. The outline of the landfill and its waste material can be observed on aerial photography 1995 (Drawing No. 10-198-003). Again the site appears to have been a local and largely informal tip rather than a large organised dump.

2.4.1.3 Landfill 2000.

An Aerial photograph from 2000 (Drawing No. 10-198-004), shows the site under continuous grass cover with no evidence of tipping.

2.5 HYDROLOGY

There is a watercourse/drain immediately located on the Northeastern boundary. The surface water drainage features receive run-off from the fill area. The water level in the stream is approximately 3.0m below the site ground level.

2.6 GEOLOGY AND HYDROGEOLOGY

Traynor Environmental Ltd established the local geological and hydrogeological conditions from a review of databases maintained by the Geological Survey of Ireland (GSI), Teagasc and the site investigation findings.

2.6.1 Soils and Subsoil

The GSI and Teagasc data bases indicate that the soil in the region of the site belong to Soil Association 29 of the General Soil Map of Ireland. A Soil Association is defined as a cartographic unit, consisting of two or more soils, usually formed from the same type of parent material and associated landscape in a particular pattern. Soil Association 29 is grouped with other associations in the broad physiographic division of the Drumlin formations (Mainly wet mineral and organic soils). The principle soils of Association 29 are Acid Brown Earths (75%) and Interdrumlin Peat and Peaty Gleys (25%). These soils are derived from mostly Ordovician – Silurian Shale glacial till.

The subsoil in the region of the site is Peat (Drawing No. 10-198-008). This information and map are compiled from the Geological Survey of Ireland (GSI). The subsoil to the Northeast of the site is Till Derived chiefly from Lower Palaeozoic Rocks.

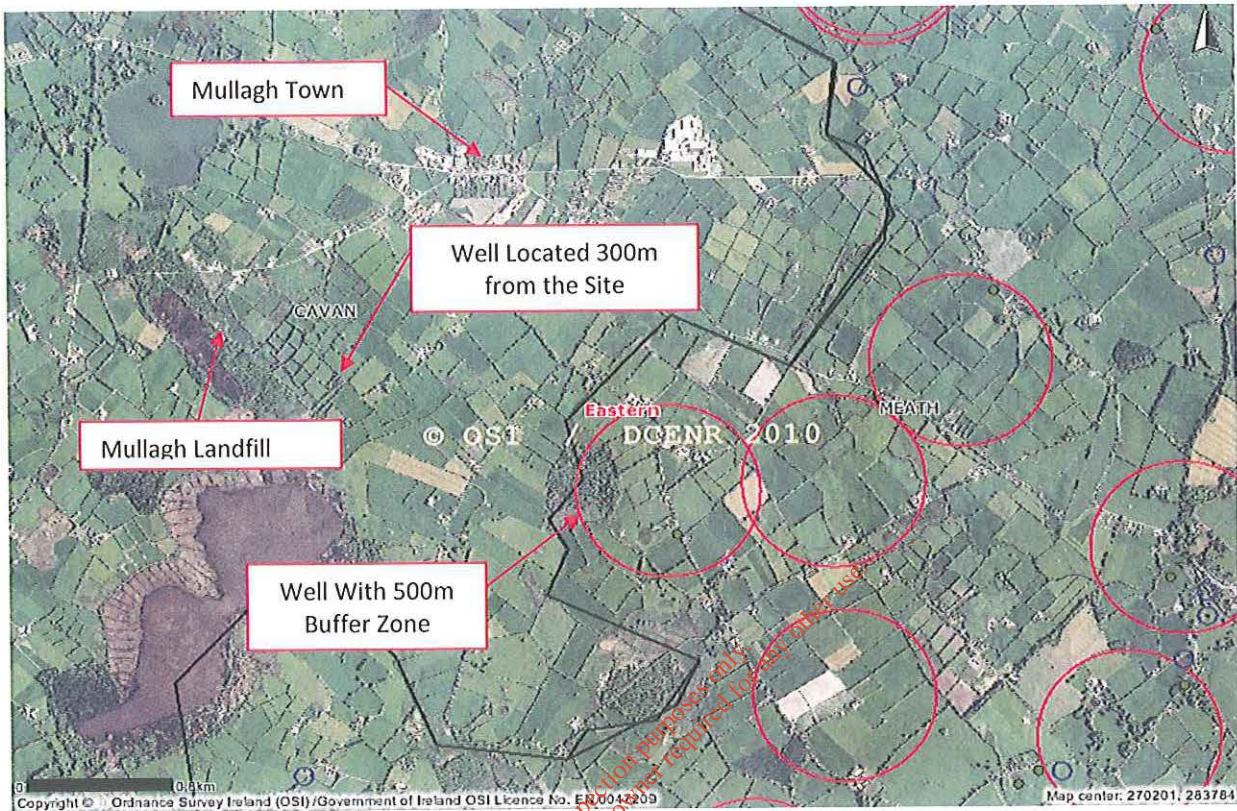
2.6.2 Bedrock Geology

The site is underlain by Silurian Metasediments and Volcanics (Drawing No. 10-198-007).

2.6.3 Hydrogeology

The GSI, EPA and the Department of the Environment, Community and Local Government (DOECLG) have developed a programme of Groundwater Protection Schemes (GPWS) with the aim of maintaining the quality and quantity of groundwater in Ireland, and in some cases improving the groundwater quality, by applying a risk assessment approach to groundwater protection and sustainable development. From the GPWS for the area it can be seen that the bedrock aquifer underlying the site has a classification of "Poor Aquifer" – Bedrock which is generally unproductive except for local zones (Drawing No. 10-198-005). The Geological Survey of Ireland has classified the vulnerability of the aquifers within the region as moderate and high to the East of the site (Drawing No. 10-198-006). According to the GSI Well Database, there is 1 well within 2.5km southeast of the site. This well is use for domestic use and has poor yield as it yields 27.3m³ per day. This well is 27.4m deep and encountered bedrock at 7.6m below ground level (BGL). However, phase 1 assessment by Cavan County Council, stated that a private well servicing a dwelling located approximately 340m Southeast from the site boundary. This well is not illustrated on the GSI Well Database.

Locations of wells in the vicinity of Mullagh Landfill.



2.6.4. Groundwater Vulnerability

The GSI vulnerability map (www.gsi.ie) indicates the vulnerability rating within the site is moderate and the area Northeast of the site is high in terms of Vulnerability (Drawing No. 10-198-006). The vulnerability mapping is based on the Vulnerability Classification Matrix (as summarised in Table 1 below), which assigns a vulnerability rating depending on the characteristics of the overburden deposits, the thickness of the strata and in case of drift aquifers, depth of the unsaturated zone. Taking account of the fact that the aquifer is a poor aquifer coupled with the vulnerability level an $R2^1$ response is recommended. The level of response depends on the different elements of risk; the vulnerability, the value of the groundwater and the contaminant loading. A response level of $R2^1$ is acceptable in principle depending on the zone and activity. All the above facts would minimise the impact on groundwater resources.

Table 1: Response Matrix for Landfills

VULNERABILITY RATING	SOURCE PROTECTION AREA		RESOURCE PROTECTION					
			Aquifer Category					
	Inner (SI)	Outer (SO)	Regionally Important (R)		Locally Important (L)		Poor Aquifer (P)	
Rk			Rf/Rg	Lm/Lg	L1	PI	Pu	
Extreme (E)	R4	R4	R4	R4	R3 ²	R2 ²	R2 ²	R2 ¹
High (H)	R4	R4	R4	R4	R3 ¹	R2 ¹	R2 ¹	R1
Moderate (M)	R4	R4	R4	R3 ¹	R2 ²	R2 ¹	R2 ¹	R1
Low (L)	R4	R3 ¹	R3 ¹	R3 ¹	R1	R1	R1	R1

Acceptable subject to guidance in the EPA Landfill Design Manual or conditions of a waste licence.

- Special attention should be given to checking for the presence of high permeability zones. If such zones are present then the landfill should only be allowed if it can be proven that the risk of leachate movement to these zones is insignificant. Special attention must be given to existing wells down gradient of the site and to the projected future development of the aquifer.

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3.0 SITE INVESTIGATION

A Tier 1 Risk assessment was carried out which included a visual inspection, desktop study and risk classification of the site. The Tier 1 Risk assessment was carried out in September 2009. Mullagh historic landfill has a moderate risk (B) classification after the Tier 1 risk assessment. Moderate risk sites are sites where any of the Source-Pathway-Receptor (SPR) linkages have a score between 40% and 70%. The risk assessment methodology for Mullagh highlighted SPR linkage number 8 which has a risk score rating above 40%. The said linkage refers to leachate migration through surface water.

3.1 OBJECTIVES

The objective of the Tier 2 Risk assessment was to collect sufficient information to allow an assessment of the environmental risk posed by the historic landfill. This was achieved by:

- Confirm Initial Conceptual Site Model
- Delineating the lateral and vertical extent of the wastes,
- Characterising the waste,
- Assessing the risk of pollution from leachate run-off to soils, surface water and groundwater,
- Assessing the potential risk presented by landfill gas.
- Confirm the presence of Source-Pathway-Receptor linkages as identified in the Tier 1 Risk Assessment.
- Form the basis to establish what remediation measures are required if any.

3.2 SITE INVESTIGATION SCOPE

The site investigation comprised of four phases.

- **Phase 1 – Topographical Survey**
Phase 1 involved the completion of a topographical survey to establish the extent of the waste material present in conjunction with trial holes excavation.
- **Phase 2 – Trial Holes Excavation and Logging**
Phase 2 involved the excavation of trial holes to confirm the lateral and vertical extent of the waste, and the collection of waste/soil for characterisation purposes.
- **Phase 3 – Sampling and Analysis**
Phase 3 involved the sampling of groundwater/soil on site and the surface water for chemical analysis; landfill gas monitoring.
- **Phase 4 – Ecological Assessment and Q Value Rating of Watercourse/drains**
Phase 4 involved the Ecological assessment and Q value rating of the local watercourses/drains.

3.2.1 Phase 1 – Topographical Survey

The topographical survey was completed by Alan Traynor Consulting Engineers Ltd on the 11th and 12th October 2010. (Please refer to drawing No. 10-198-009)

The objective was:

1. To map the entire area of the site and to estimate the total amount of waste stored on site.



Site Location

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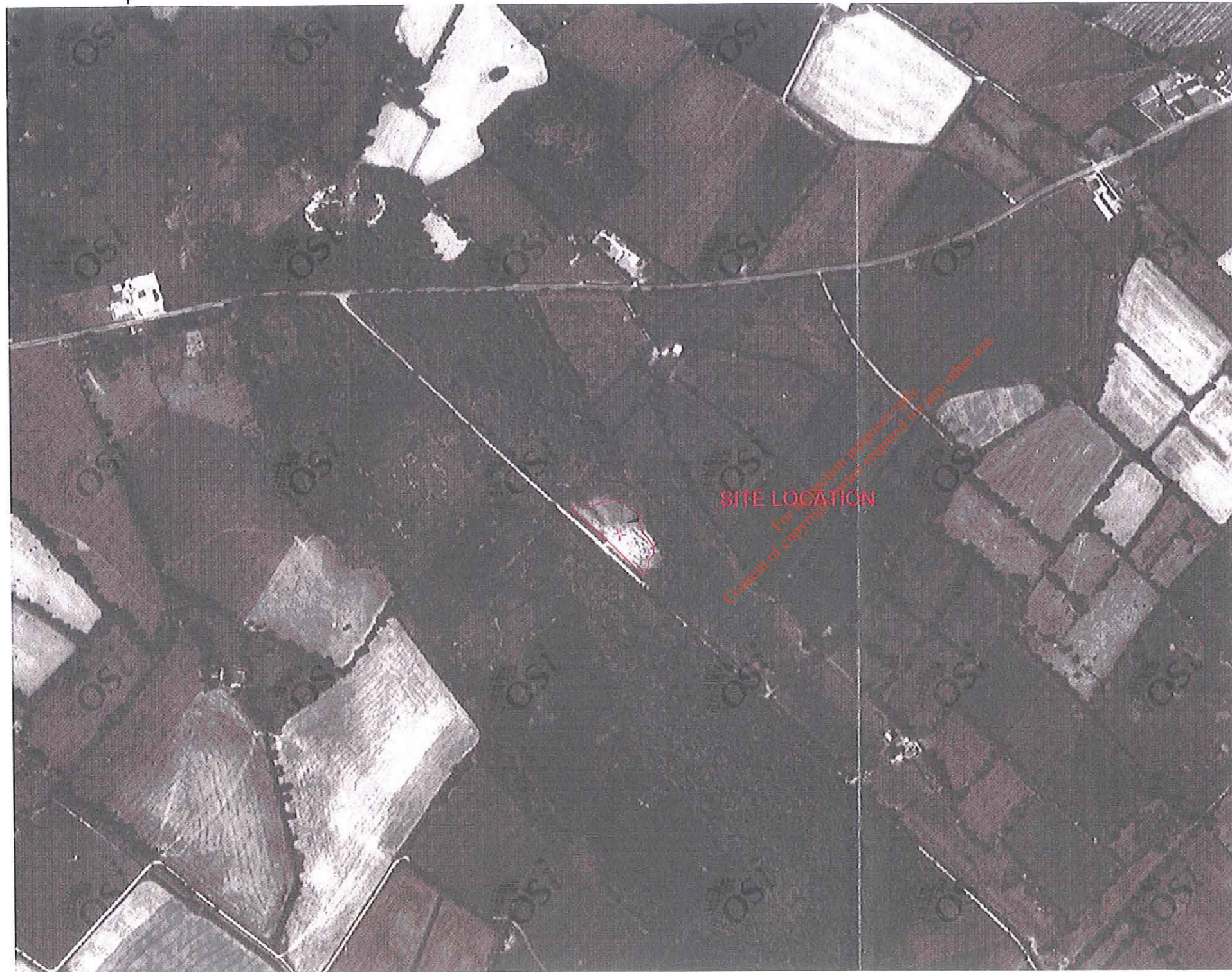
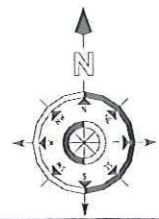
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 2000 - AERIAL MAP

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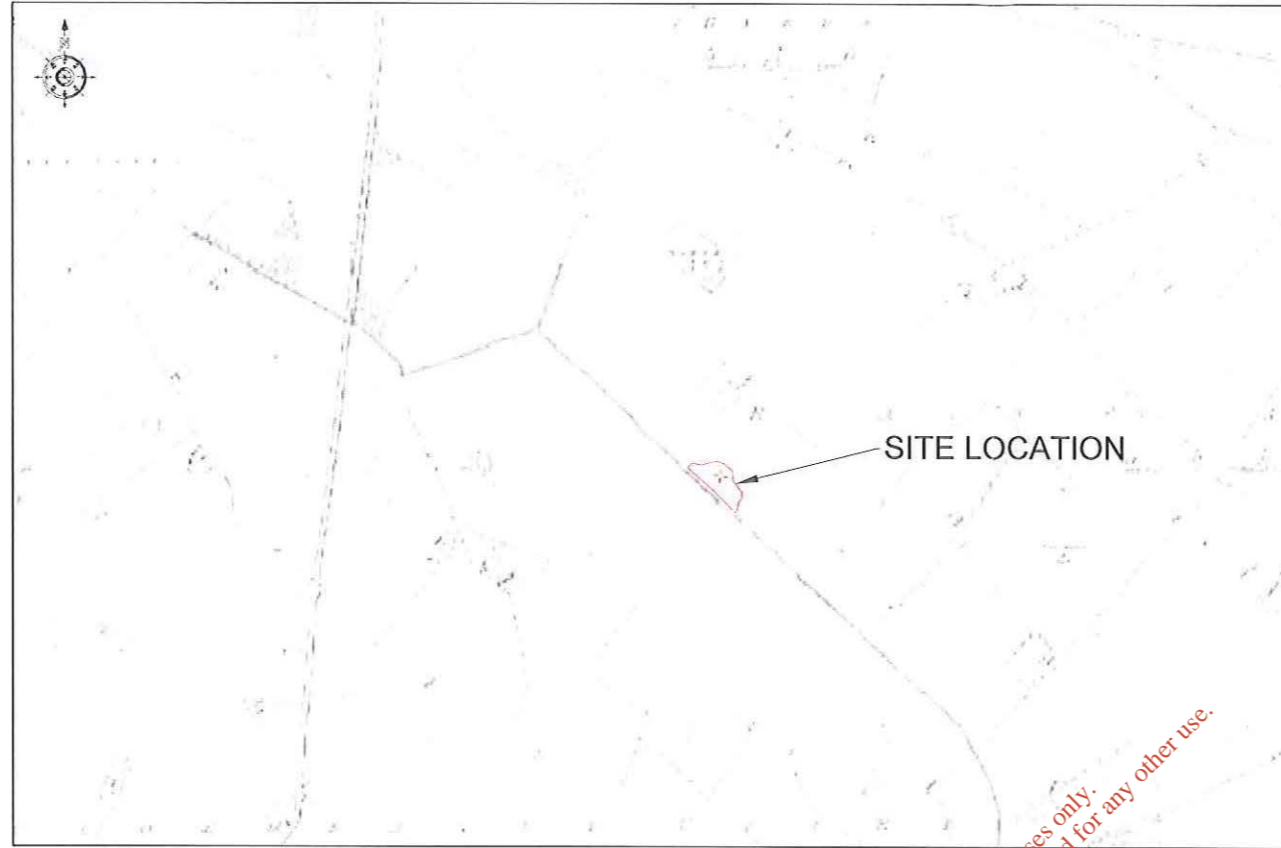
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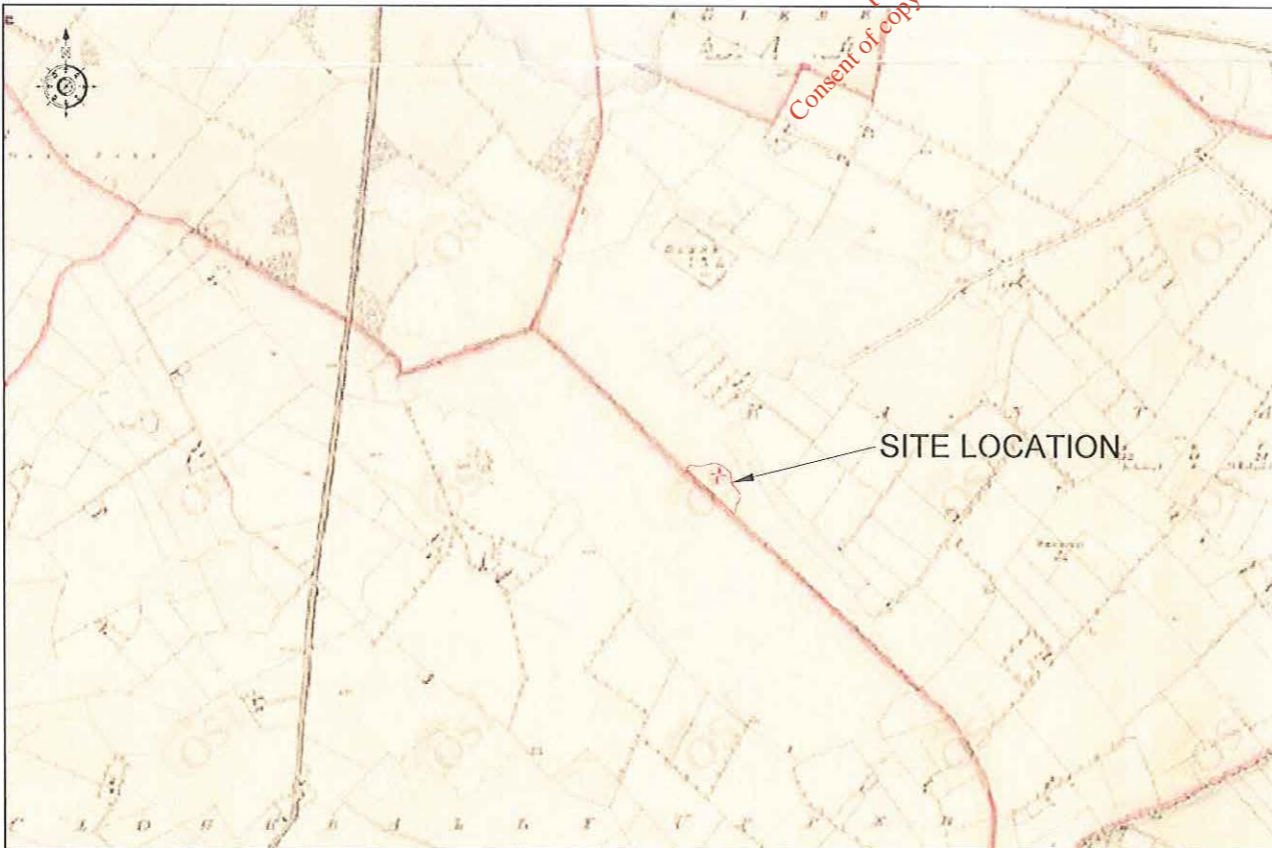
DRAWING TITLE
 ORTHO 1995
 BLACK AND WHITE AERIAL PHOTOGRAPH

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DRAWING No.	REV.
10-198-003	



6 INCH MAPPING SERIES (1888 - 1913)
SCALE 1:2000



25 INCH MAPPING SERIES (1837 - 1842)
SCALE 1:2000

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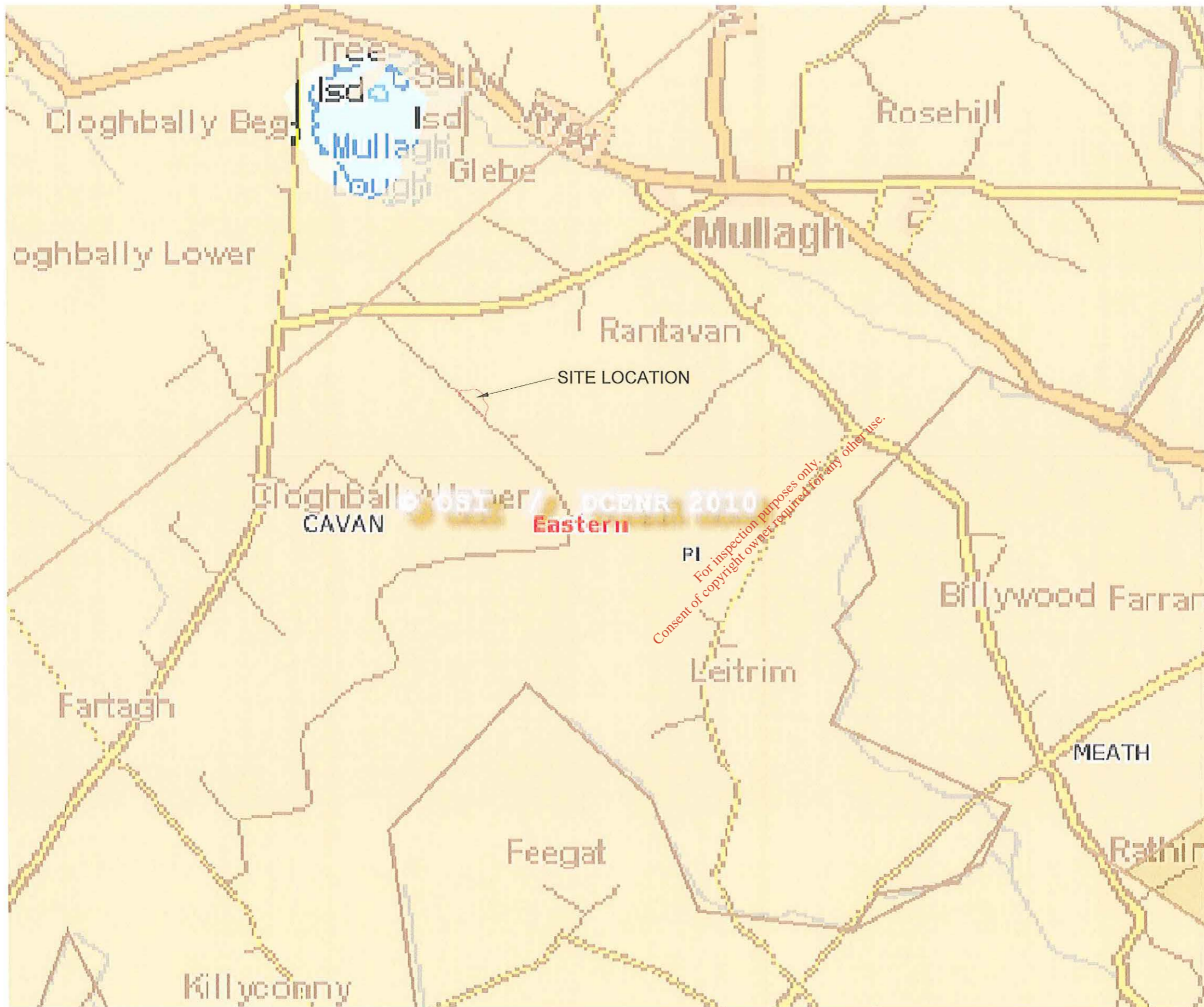
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DRAWING TITLE
HISTORIC MAPS

SCALE	DRAWN	CHECKED	APPROVED
1:20000	PAURIC LOUGHLIN	PADRAIG JORDAN	NEVIN TRAYNOR
	DATE	DATE	DATE
	NOVEMBER 2010	NOVEMBER 2010	NOVEMBER 2010

DRAWING No.	REV.
10-198-004	



NOTES

- National Draft Bedrock Aquifer Map**
- Rf - Regionally Important Aquifer - Fissured bedrock
 - Rk - Regionally Important Aquifer - Karstified
 - Rkd - Regionally Important Aquifer - Karstified (diffuse)
 - Rkc - Regionally Important Aquifer - Karstified (conduit)
 - Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
 - Lk - Locally Important Aquifer - Karstified
 - Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
 - Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
 - Pu - Poor Aquifer - Bedrock which is Generally Unproductive
 - Unclassified
- National Draft Gravel Aquifer Map**
- Rg - Regionally important, extensive sand/gravels aquifers
 - Lg - Locally Important, sand/gravel aquifers
 - No gravels present
 - Not Mapped
- Bedrock Faults 100k
 - RBD Boundaries
 - County Boundaries
 - Watermark

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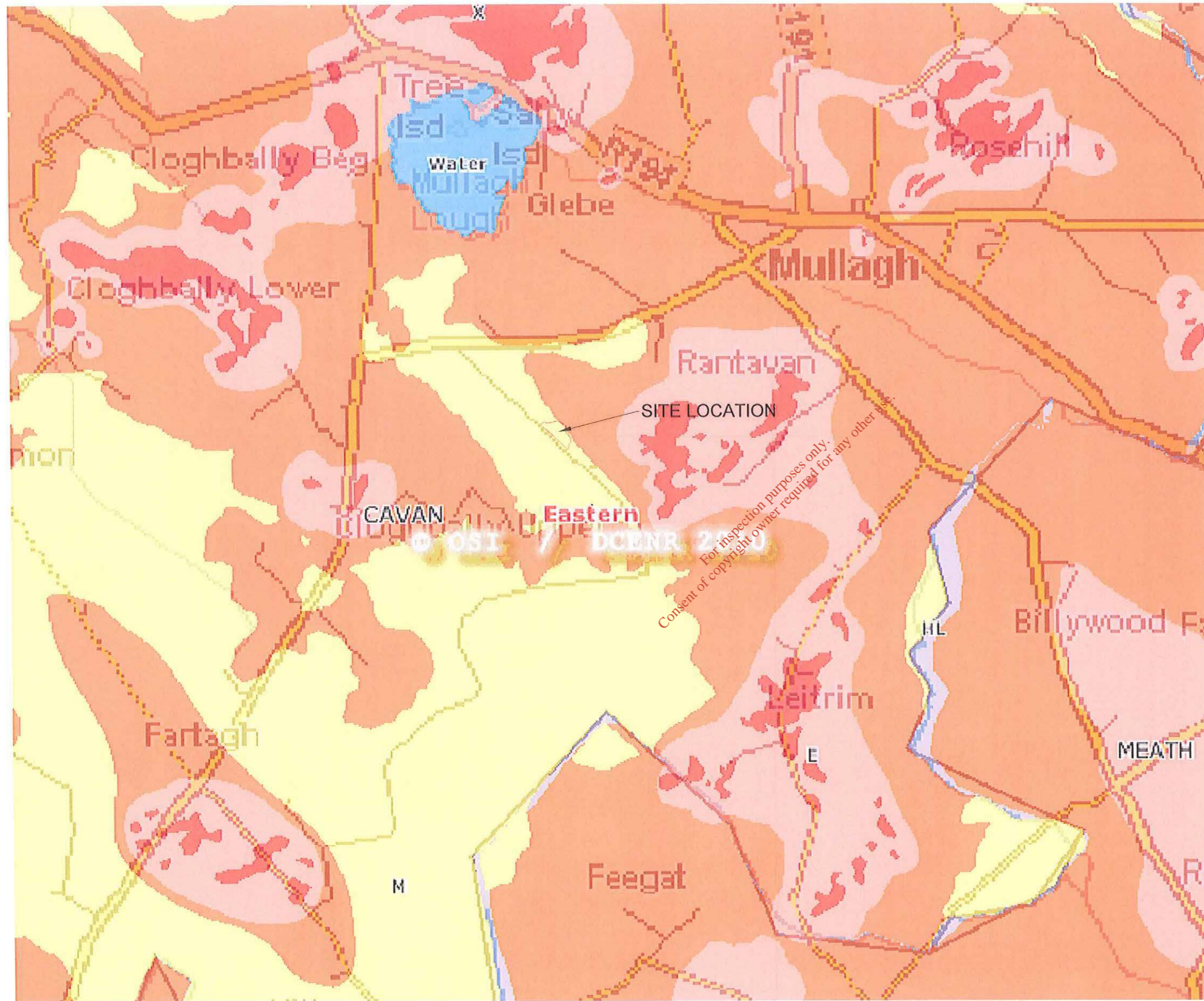
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OF EXISTING HISTORIC LANDFILL SITE AT
RANTAVAN, MULLAGH, CO CAVAN

DRAWING TITLE
GROUNDWATER MAP

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10-198-005	



NOTES

- Interim Vulnerability**
- E (Rock near Surface or Karst)
 - E - Extreme
 - H - High
 - M - Moderate
 - L - Low
 - HL - High to Low. Only an interim study took place.
 - Water
 - RBD Boundaries
 - County Boundaries
 - Watermark

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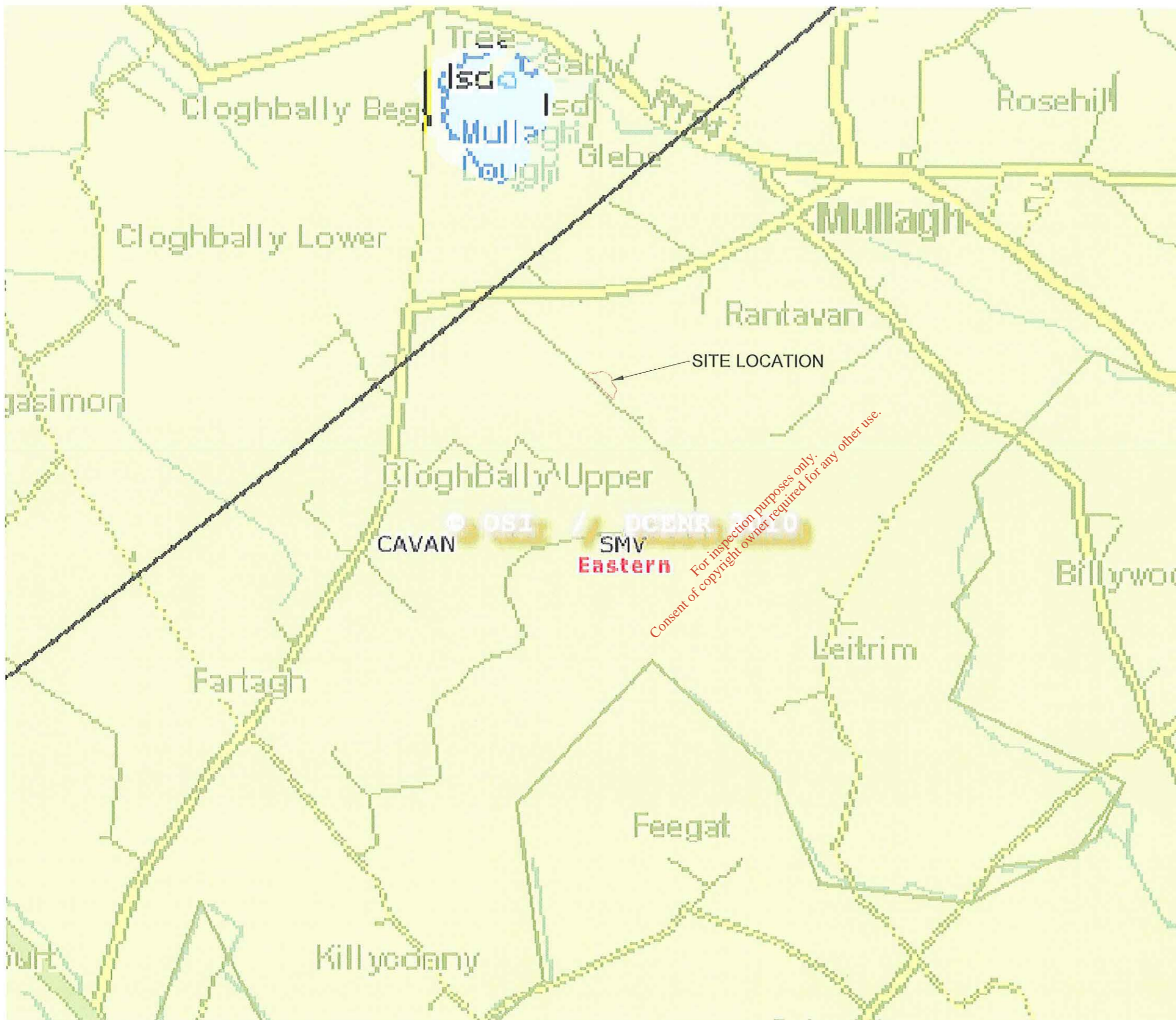
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DRAWING TITLE
 VUNERABILITY MAP

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NOTES

- Bedrock Faults 100k
National Draft Generalised Bedrock Map
- BV - Basalts and other Volcanic rocks
 - CM - Cambrian Metasediments
 - DDL - Dinantian Dolomitised Limestones
 - DESSL - Dinantian early Sandstones, Shales and Limestones
 - DKS - Devonian Kiltoran type Sandstones
 - DLIL - Dinantian Lower Impure Limestones
 - DMSC - Dinantian Mudstones and Sandstones Cork Group
 - MSSL - Dinantian Mixed Sandstones, Shales and Limestones
 - DORS - Devonian Old Red Sandstones
 - DPBL - Dinantian Pure Bedded Limestones
 - DPUL - Dinantian Pure Unbedded Limestones
 - DS - Dinantian Sandstones
 - DSL - Dinantian Shales and Limestones
 - DUUL - Dinantian Upper Impure Limestones
 - GII - Granites and other Igneous Intrusive rocks
 - NSA - Namurian Sandstones
 - NSH - Namurian Shales
 - NU - Namurian Undifferentiated
 - OM - Ordovician Metasediments
 - OV - Ordovician Volcanics
 - PM - Precambrian Marbles
 - PQGS - Precambrian Quartzites, Gneisses and Schists
 - PTMG - Permo Triassic Mudstones and Gypsum
 - PTS - Permo Triassic Sandstones
 - SMV - Silurian Metasediments and Volcanics
 - WSA - Westphalian Sandstones
 - WSH - Westphalian Shales

- RBD Boundaries
- County Boundaries
- Watermark

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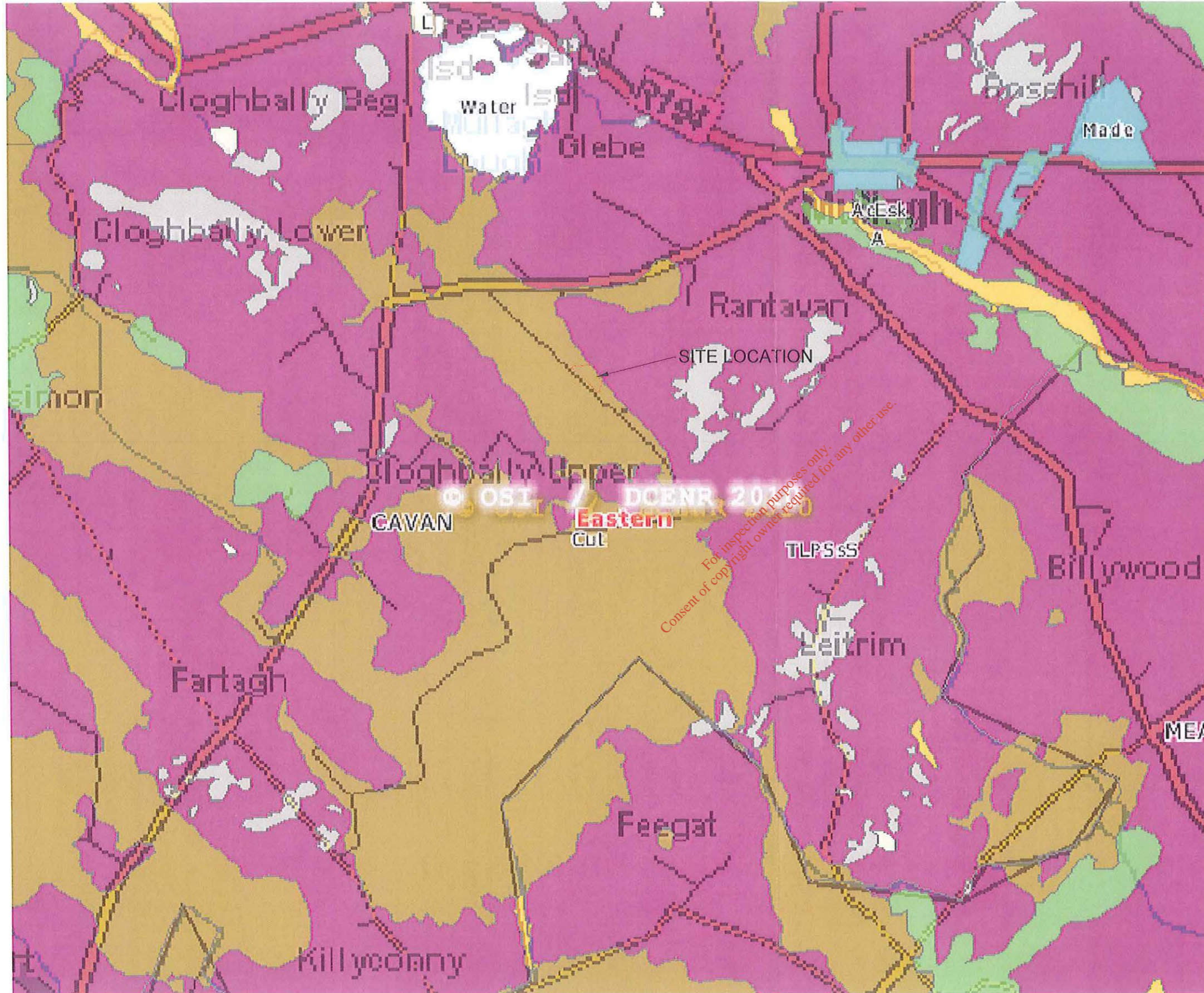
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DRAWING TITLE
 BEDROCK MAP

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NOTES

RBD Subsoils

- Alluvium
- Beach sands and gravels
- Bedrock outcrop and subcrop
- Esker sands and gravels
- Glaciofluvial sands and gravels
- Lake sediments
- Made ground
- Marine/estuarine silts and clays
- Marsh
- Peat
- Scree
- Till derived chiefly from Devonian sandstones
- Till derived chiefly from Lower Palaeozoic rocks
- Till derived chiefly from Namurian rocks
- Till derived chiefly from granite
- Till derived chiefly from limestone
- Till derived chiefly from metamorphic rocks
- Till derived from metamorphic rocks
- Till derived from mixed Devonian and Carboniferous rocks
- Water
- Windblown sands

RBD Boundaries

County Boundaries

Watermark

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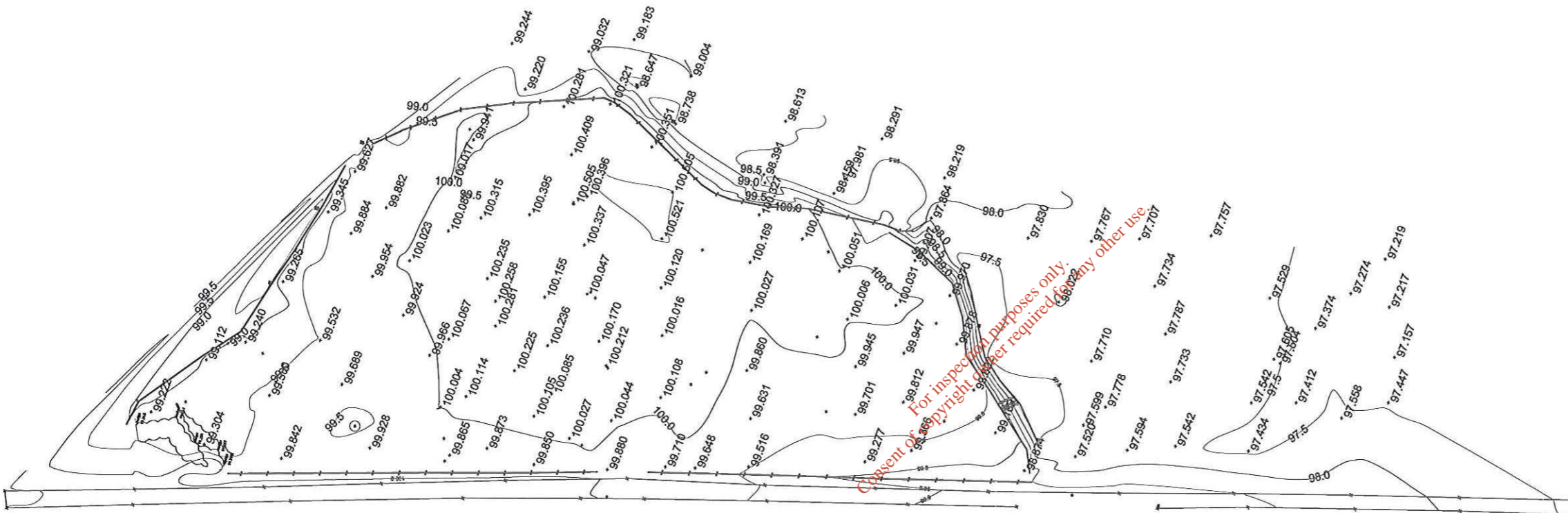
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DRAWING TITLE
 SUBSOIL MAP

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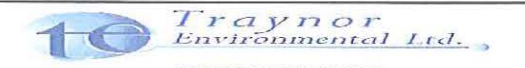
NOTES



SITE SURVEY
2010

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DRAWING TITLE
TOPOGRAPHICAL SURVEY

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10-198-009	

3.2.2 Phase 2 – Trial Holes Excavation and Logging

The trial hole survey was carried out on the 13th October 2010. Areas of overgrown vegetation, as shown on Photograph 1, The objectives were:

1. To assess the sub-surface conditions including thickness and lateral extent of the buried wastes;
2. To identify possible leachate, especially towards the adjacent watercourse/drain;
3. To locate any hazardous waste within the waste material.
4. Characterise any wastes on site including hazardous wastes.

The trial holes were excavated using a track mounted excavator, capable of travelling on variable terrain and with a reach of 3 – 5 metres. The locations of the trial holes are shown on drawing No. 10-198-010. The excavation of the trial holes was supervised by Traynor Environmental Ltd and Cavan County Council. Each trial hole was logged. The trial hole logs are included in Appendix A.

3.2.3 Phase 3 - Sampling of Groundwater, Surface Water, Soils & Landfill Gas

Phase 3 involved the sampling of groundwater, surface water and soil for chemical analysis. Landfill gas was also analysed on site. The site was divided into equal sections. Trial holes were excavated to represent the site. A total of 21 trial holes were excavated. 18 trial holes were excavated in the landfill area itself. 3 trial holes were excavated outside of the main body of the landfill for the purpose of providing a baseline assessment. From the 21 trial holes excavated on site a scoring matrix was developed and from this it was decided which samples would be used for the purpose of the environmental risk assessment.

Each trial hole was assigned a rating based on the severity of pollution in the trial hole. An assigned value of “0” indicated that there was no pollution whereas an assigned value of “10” indicated that there was serious pollution. The severity of pollution was based on visual observations by field operatives of Traynor Environmental and Cavan County Council during the excavations of the trial holes. The severity of pollution scale was developed and applied, to assure that sampling was concentrated in areas deemed heavily contaminated and of most concern while at the same time being cognisant of financial constraint and sampling requirements. As it was not feasible to test every trial hole for groundwater and soil, specific test holes were sampled for groundwater and soil which would provide a representative view of the site. Refer to Table 2 Trial holes severity rating.

Based on the field observations and field screening, which indicated that waste was generally consistent across the site.

- Trial Holes TH3, TH6, TH8, TH11, TH13, TH15, TH18 & TH21 (Baseline) were sampled for the purpose of Groundwater sampling.
- Soil samples were taken from Trial Holes TH11, TH13, TH18 and TH21 (Baseline).
- Surface water Samples were collected from SW-1, SW-2 (upstream), SW-3 and SW-4 (downstream).

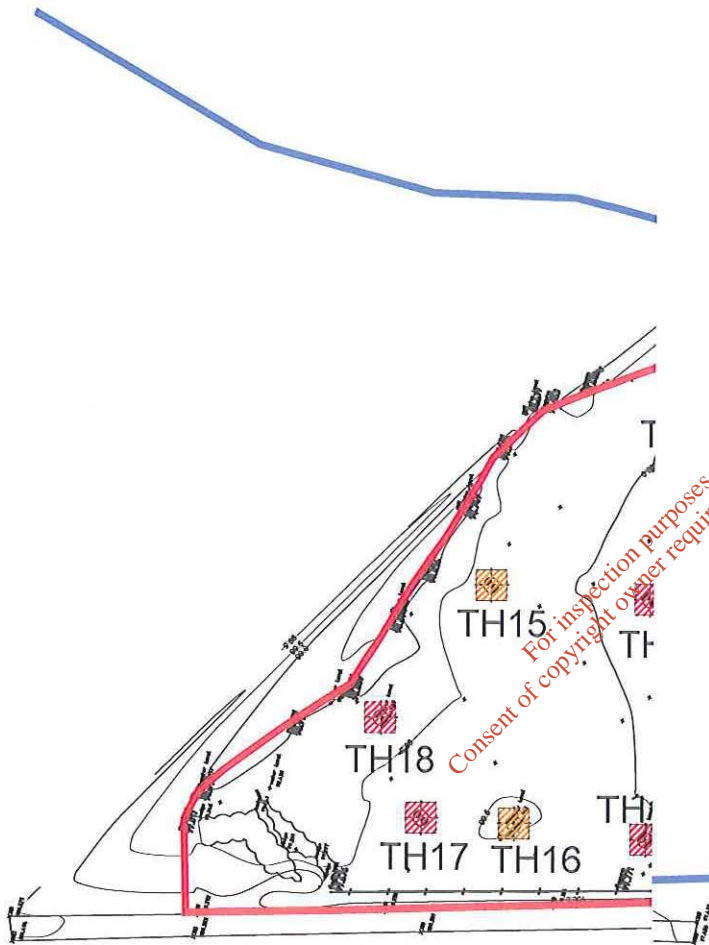
NOTES

⊕ TH1 TRIAL HOLE LOCATION

— SITE BOUNDARY


 SEVERITY RATING

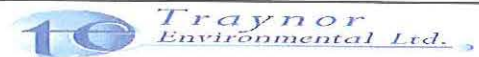


TRIAL HOLE LOCATION
SCALE 1:1000

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DRAWING TITLE
TRIAL HOLE LOCATION

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10-198-010	

Table 2: Trial Holes Severity Rating.

Trial Hole No.	Contaminated with Oil	Severity Rating
1	Yes	1
2	Yes	3
3	Yes	4
4	Yes	4
5	Yes	6
6	Yes	2
7	Yes	2
8	Yes	5
9	Yes	8
10	Yes	6
11	Yes	8
12	Yes	8
13	Yes	8
14	Yes	4
15	Yes	5
16	Yes	5
17	Yes	7
18	Yes	9
19	No	0
20	No	0
21	No	0

	Severity Rating of 0 (Unpolluted)
	Severity Rating of 1 – 3 (Lightly Polluted)
	Severity Rating of 4 – 6 (Moderately Polluted)
	Severity Rating of 7 – 10 (Very Polluted)

The samples were placed in laboratory prepared containers and stored in coolers prior to shipment to Alcontrol Laboratories.

3.2.4 Phase 4 – Ecological Assessment and Q Value Rating of Watercourse/drains

An ecological assessment was carried out on the site and Q value rating of the watercourse/drains was used for the assessing of the water quality upstream, adjacent and down stream of the landfill site. The summary of the results from the Ecological Survey can be seen in the following table. Please refer to the Ecological Report carried out by Noreen McLoughlin MSc MIEEM. included in Appendix B Tier 2 Assessment.

Q-Assessment Findings.

Station	Location	Q Rating	Status	Quality
1	Main Stream within Site	Q2	Seriously Polluted	Poor
2	Drain feeding Stream	Q2-3	Moderately Polluted	Poor
3	70m Downstream of Site	Q3	Moderately Polluted	Poor

3.3 VERTICAL EXTENT OF WASTE

The waste on site is covered by a thin layer of topsoil, which in some areas of the site is underlain by a layer of clay fill which ranged in thickness from 0.2m (TH16) to 1.0m (TH 10). The average thickness of this layer is 0.54m. This Clay layer was underlain by waste material which ranged in thickness from 0.4m (TH9) to 2.2m (TH9). The waste is thickest in the centre of the site, with an average thickness across the site of 1.25m. The base of the waste is defined by a layer of peat, which marks the top of the underlying natural subsoils.

Table 3: Groundwater Level and the Waste Depths In Each Trial Hole.

Trial Hole No.	Total Trial Hole Depth (m)	Groundwater Level (m)	Waste start depth (m)	Waste finish depth (m)	Depth of waste (m)
TH1	2.1	1.6	0.6	1.9	1.3
TH2	2.2	1.7	1.0	2.0	1.0
TH3	2.7	1.6	0.5	1.9	1.4
TH4	2.1	1.4	0.5	1.9	1.4
TH5	2.1	1.4	0.5	1.8	1.3
TH6	2.2	1.3	0.5	1.7	1.2
TH7	2.2	1.4	0.8	1.8	1.0
TH8	2.4	1.9	0.6	2.1	1.5
TH9	2.5	2.0	0.4	2.2	1.8
TH10	2.2	1.3	1.0	1.8	0.8
TH11	2.3	1.4	0.7	1.8	1.1
TH12	2.3	1.3	0.5	1.9	1.4
TH13	2.4	1.6	0.5	2.0	1.5
TH14	2.0	1.2	0.3	1.7	1.4
TH15	1.8	1.1	0.2	1.5	1.3
TH16	1.6	0.7	0.2	1.3	1.1
TH17	2.4	1.2	0.6	1.6	1.0
TH18	1.5	0.6	0.3	1.2	0.9
TH19	2.0	1.6	-	-	-
TH20	2.1	1.8	-	-	-
TH21	2.4	1.9	-	-	-

3.4 LATERAL EXTENT OF THE WASTE

The North-eastern extent of the landfill was defined by a hedgerow and watercourse/drain which separates the site from the adjacent agricultural land. Wastes were encountered in 18 trial holes (TH1 – TH18), but were not found in the three trial holes (TH19, TH20, TH 21) to the Southeast of the landfill. The waste extends from the local road on the Southwestern boundary to the fence on the North-western boundary. The lateral extent of the waste is shown in drawing No. 10-198-011, and covers an area of ca 8,589m². It is estimated, that approximately 18,900 tonnes of waste is deposited at the site.

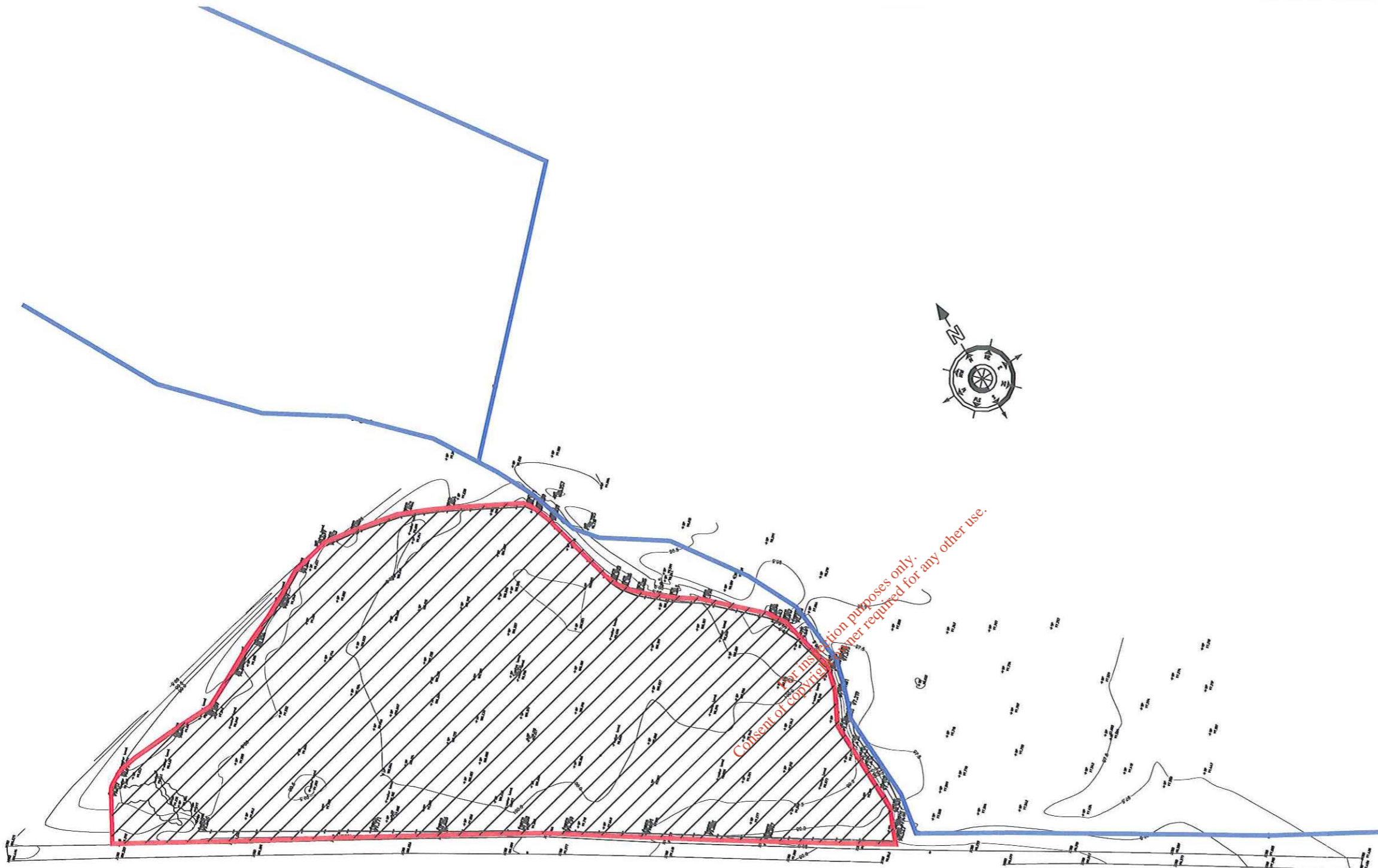
3.5 WASTE CHARACTERISATION

The waste comprised a mix of plastic and glass bottles, occasional empty flattened steel drums, empty plastic drums, concrete pipes, steel, papers, tyres, tyre tubes, wire, end of life vehicles, vehicle parts, municipal waste, timber and trees, all of which were supported by a stony clay matrix. It is assumed that the stony clay was used as cover material when the site was operational, but no discrete layers were noted. No datable materials (newspapers, stationary) which could be used to establish the age of the waste was found. There was evidence of a significant amount of potentially hazardous waste (e.g. oils), staining or odours. Photographs 2 - 8 illustrate the types of waste encountered. Full trial holes assessment and logs can be found in the Appendix A

Photograph 1: Overgrown Vegetation prior to Investigation.



NOTES



- OPEN DRAINS
- SITE BOUNDARY
- / / / / LATERAL EXTENT OF WASTE

LATERAL EXTEND OF WASTE
SCALE 1:1000

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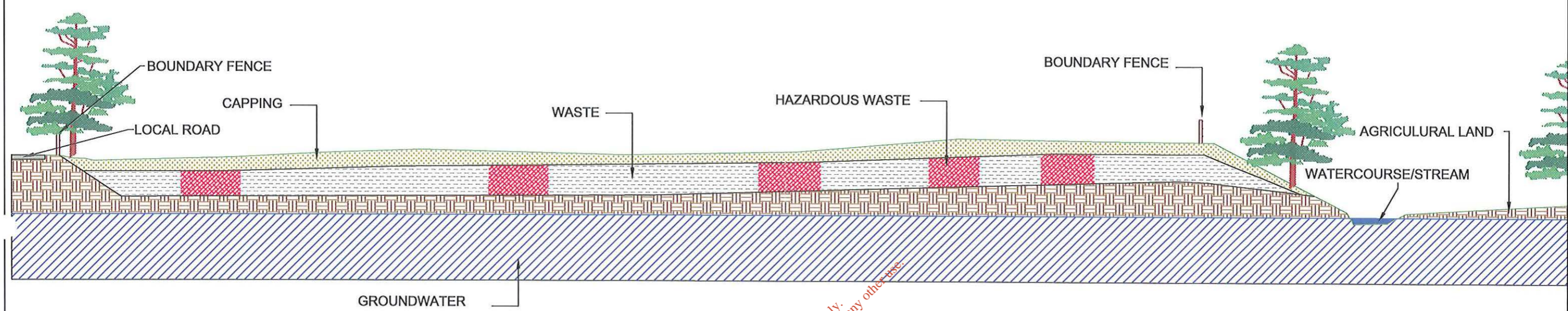
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DRAWING TITLE
 LATERAL EXTEND OF WASTE DEPOSITED
 ON THE SITE

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10-198-011	

NOTES



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CROSS SECTION OF WASTE
SCALE 1:200

- TRIAL HOLES WHERE HAZARDOUS WASTE WAS IDENTIFIED
- LANDFILL WASTE SOURCE
- EXISTING SUBSOIL
- GROUNDWATER
- WATERCOURSE / DRAIN
- CAPPING

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CROSS SECTION OF WASTE DEPOSITED
ON THE SITE

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Photograph 2: Waste in TH1



Photograph 3: Waste in TH 3



Photograph 4: Waste in TH 7



Photograph 5: Waste in TH 8



Photograph 6: Waste in TH 9



Photograph 7: Waste in TH 13



Photograph 8: Waste in TH 16



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