

# Kildare County Council Environment Section



Waste Management Act 1996 - 2008 Section 22 Sites

Carrigeen Refuse Depot, Clane  
Conceptual Site Model and Risk Assessment

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## Carrigeen Refuse Depot, Clane

### Site Summary

#### Relevant Risk Screening Parameters.

*Name:* Carrigeen Refuse Depot.

*Source:* Municipal Waste Aug '77 to June '80.

*Geology:* Limestone rock outcrops and shallow rock. Disused rock/gravel quarry.

*Groundwater:* Locally important aquifer of extreme vulnerability (LI/E).

*Surface Water:* Stream 6.5m from waste body. River Liffey 85m east of waste body.

*Human Presence:* Nearest dwelling 7.5m west of waste body footprint.

*Protected Areas:* None within 1km of waste body.

*SPR Linkage:* SPR8 score of 50% for leachate migration to Surface Water Bodies.

*Risk Classification:* **Moderate Risk.**

### Background

#### Location (Map ERA/C/DIS)

Carrigeen Refuse Depot is located within a residential area, approximately 1km south of Clane village. Houses in the area are located on individual sites of approximately 1 acre. Millicent Golf Course is immediately south of the waste body. The site of the Carrigeen Refuse Depot is located at the end of a cul-de-sac which provides access to one-off houses and paddocks. A single dwelling is located 7.5m to the west of the waste body. A second dwelling is located 40m southeast of the waste body. The River Liffey is 85m to the east of the waste body and flows parallel to the eastern boundary in a northerly direction. A stream, located 6.5m north of the site, discharges to the River Liffey.

#### Desk Top Study

Kildare County Council's files indicate that a disused pit at Carrigeen, Clane was leased as a site for a refuse depot from the owner for the period 1<sup>st</sup> August 1977 to 20<sup>th</sup> June 1980. The lease agreement stipulated that the pit was to be used as a "dumping ground and central refuse dump for the

disposal of all domestic, street and road refuse and such like material". Accordingly the waste type has been classified as "Municipal" for the purpose of this risk assessment. Records indicate that the site was secure during the period of operation. The site was subsequently capped with a minimum of 450mm of a "gravely, clayey material" but settlement of up to 450mm was reported to have occurred and there were random depressions throughout the site.

During the wet winter of 2009/2010 Kildare County Council received complaints from the public of a reddish coloured overflow runoff from ponding immediately inside the northern boundary of the site of the Carrigeen Refuse Depot, Clane (Appendix 1: Photo 9, 10, 11 and 12). The leachate flowed across the road surface of the cul-de-sac to a stream draining lands north of the site. This stream discharges to the River Liffey, 85m east of the site.

Aesthetically this discharge was a concern for the local residents and representations were made by local County Councillors on their behalf. Kildare County Council took four surface water samples, the stream upstream of the leachate discharge point, the ponding inside the fence of the site, the leachate itself and the stream at a point 50m downstream of the discharge point. At the time of sampling there was found to be elevated concentrations in the pond sample and leachate sample of some parameters namely, BOD, COD, Conductivity, Suspended Solids, Iron, Manganese and Lead.

### **Walkover Survey (Appendix 9)**

The exact extent of the Carrigeen Refuse Depot in Clane is assumed to match the footprint of the gravel/rock quarry as identified on the ordinance survey mapping in Appendix 2. The plan area is approximately 0.979 hectares. Records indicate that 450mm of "gravely / clayey topsoil" was used to cap the site. The current landuse of the site can be divided into three sections namely garden to the west, paddock centrally and disused /scrub to the east (Appendix 3). However the development of a lawn, a paddock and the disused area, which appears to have been used in the past as an area for quad bike scrambling, has altered the profile of what was the finished capping layer. Also, shortly after capping the site in 1980, there were reports of settlement and depressions on the site.

The site has a steep gradient falling from south to north with depressions evident in the scrub section of the site. During the winter months ponding is evident at the northern boundary in particular with a red leachate overflowing onto the road pavement which in turn discharges to a stream on the far side of the cul-de-sac. The road surface is stained a red/rust colour as a result of this runoff.

### **Geology (Appendix 5 and 6)**

The GSI groundwater vulnerability mapping identifies the site of the Carrigeen Refuse Depot as having rock outcrops/ shallow rock. Local knowledge describes the site as having been a quarry with exposed rock faces. The site

is located within a groundwater protection zone of local importance and extreme vulnerability (LI/E).

#### **Tier 1 Risk Assessment Findings. (Appendix 4)**

Following the Tier 1 Risk Assessment (Appendix 6) carried out on the site of the Carrigeen Refuse Depot a risk rating of 50% was assigned for leachate migration to a surface water body (**SPR8**). Accordingly this historic unregulated waste disposal site is categorised as a Moderate Risk site.

#### **Cost estimate of Tier 2 Site Investigation and testing. (Appendix 8)**

Site investigation specialists Golders Associates Ireland Ltd. were asked to provide a cost estimate to carry out Tier 2: Exploratory Investigation & Sampling of the site in accordance with the EPA Code of Practice for unregulated waste disposal sites. A cost estimate of €13,900 (ex VAT) with, depending on the findings of the trial pitting, an optional additional cost of a Geophysical Survey of €3,800 (ex VAT) has been submitted i.e. total €17,700 (ex VAT).

#### **Access to site.**

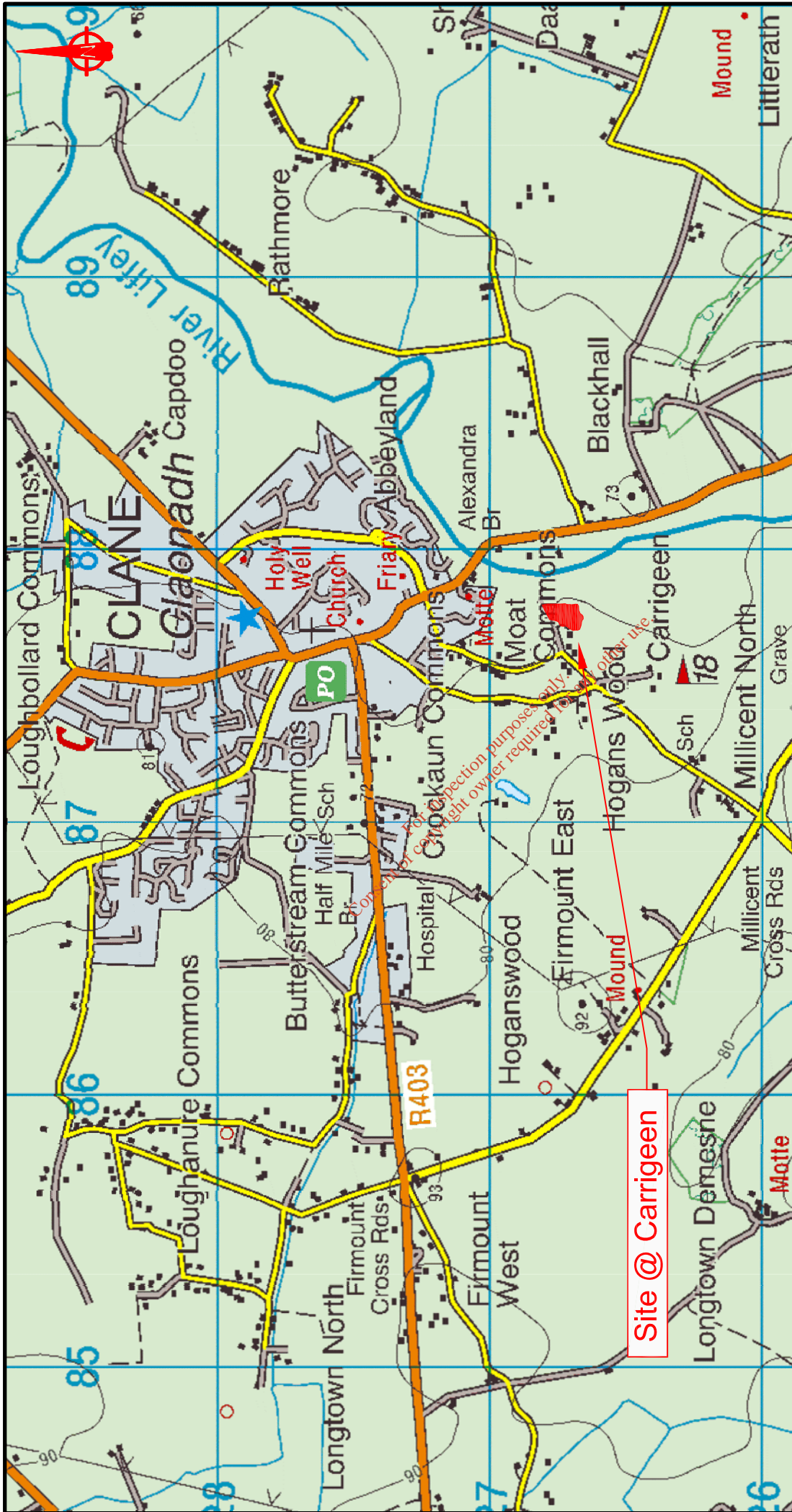
The site is secure. Due to the current landuse of the Carrigeen refuse depot site it is proposed to confine any intrusive investigations, i.e trial pitting, to the scrub land area to the eastern section of the site. Samples of the capping layer are proposed in the paddock area. Five leachate / gas monitoring wells are also proposed. A geophysical survey will be carried out if trial pitting does not provide adequate information. Access is available to the site.

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Environment Section.

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Senior Engineer,  
Environment Section.



TITLE:

Environmental Risk Assessment for Unregulated Waste Disposal Sites

DRAWING NUMBER:

ERA / C / DIS



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 DIRECTOR OF SERVICES: JOE BOLAND  
 SENIOR ENGINEER: MICHAEL HOLLIGAN

PROJECT:

Discovery Mapping

DRAWING:

Carrigeen Refuse Depot, Clane

Scale:

1: 20,000

Date:

May 2010

Drawn by:

D.O.B.

Site @ Carrigeen

# Appendix 1: Photographic Survey

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Photo 1: View of access road along hedgerow on eastern boundary of site.



Photo 2: View from southern boundary towards dwelling 40m southeast of site.





Photo 3. View of Millicent Golf Course to south of site.



Photo 4: View of disused / scrub land and paddock from southern boundary.



Photo 5: View from southern boundary of paddock, garden and dwelling 7.5m to the west of site.



Photo 6: View of southern boundary of paddock.



Photo 7: Area of ponding inside northern boundary fence.



Photo 8: Area of ponding inside northern boundary fence.



Photo 9: Leachate runoff onto road from inside northern boundary.



Photo 10: Leachate runoff flowing across the cul-de-sac to stream.



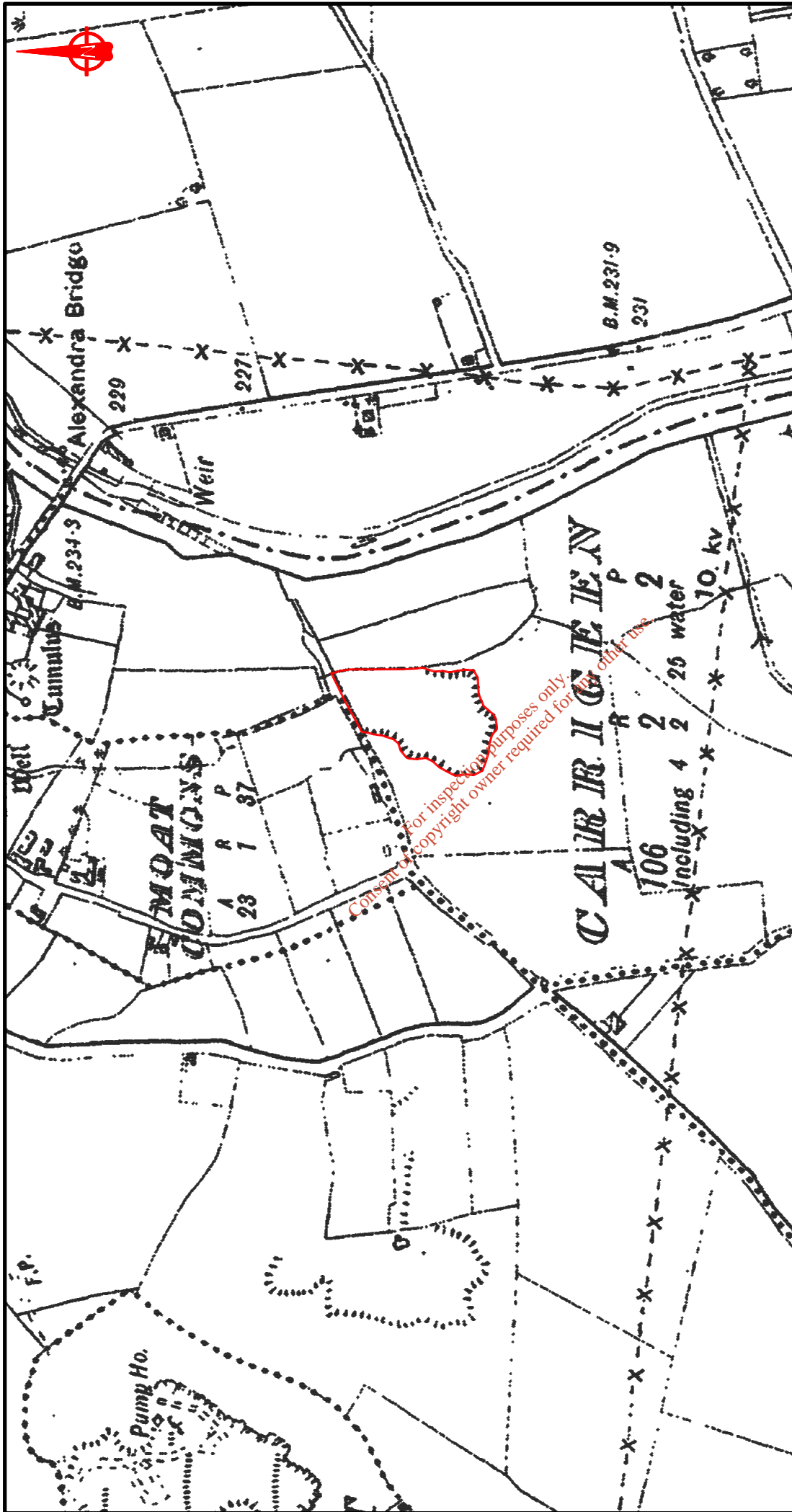
Photo 11: "Reddish" leachate on road pavement.



Photo 12: Leachate discharging to stream.

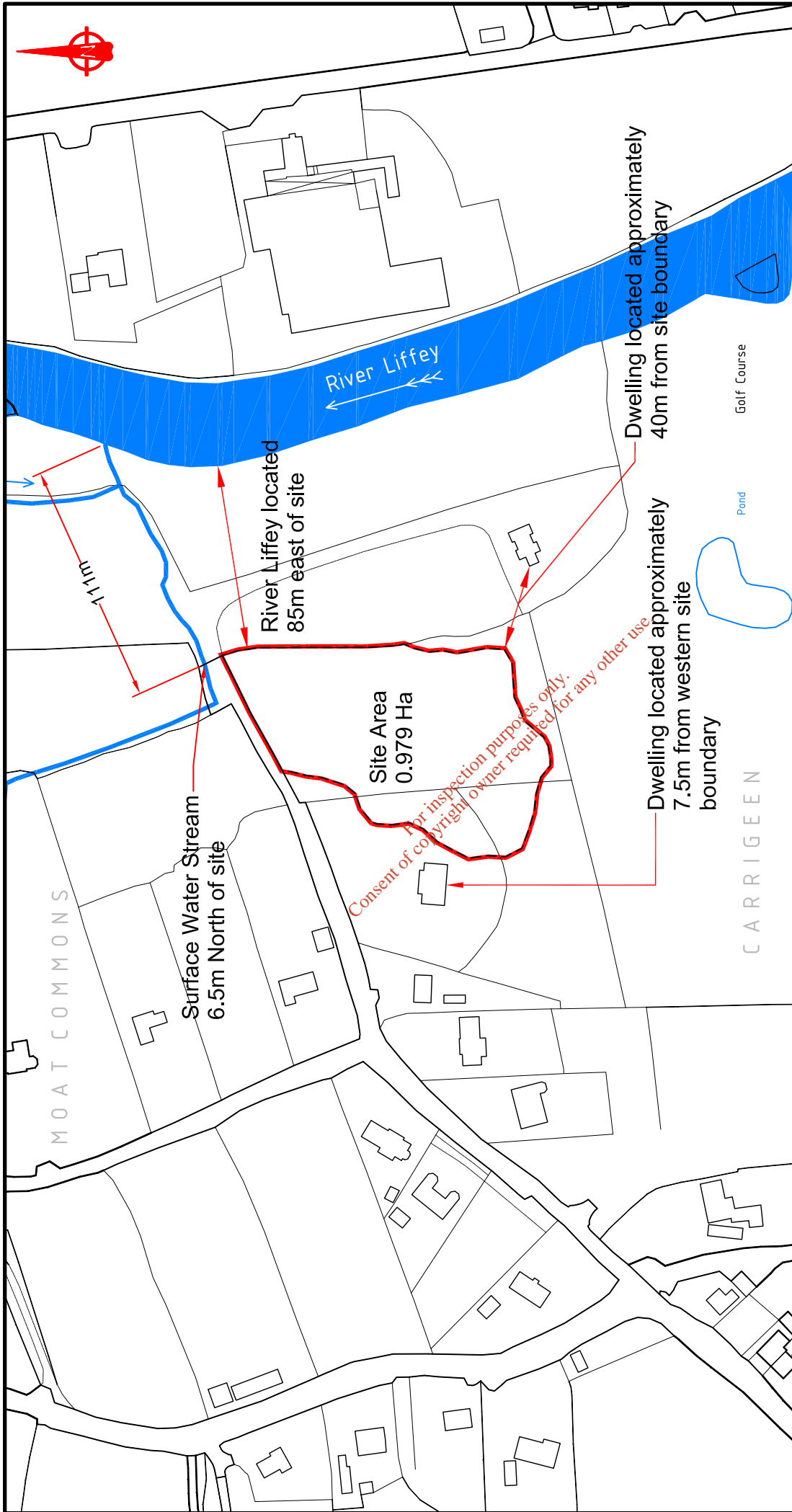
## Appendix 2: Ordinance Survey Mapping

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<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites	<b>DRAWING NUMBER:</b> ERA / C / OS
	<b>PROJECT:</b> Historical Ordnance Mapping
<b>KILDARE COUNTY COUNCIL</b> <b>Environment Section</b> Áras Chill Dara, Devoy Park, Naas, Co. Kildare. Tel: +353-45-980588, Fax: +353-45-980587, e-mail: envirm@kildarecoco.ie <b>DIRECTOR OF SERVICES:</b> JOE BOLAND <b>SENIOR ENGINEER:</b> MICHAEL HOLLIGAN	<b>DRAWING:</b> Carrigreen Refuse Depot, Clane
	<b>Scale:</b> 1: 5,000 <b>Date:</b> May 2010 <b>Drawn by:</b> D.O.B.





<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites	<b>DRAWING NUMBER:</b> ERA / C / DIG
	<b>PROJECT:</b> Digital Mapping
<b>KILDARE COUNTY COUNCIL</b> <b>Environment Section</b> Áras Chill Dara, Devoy Park, Naas, Co. Kildare. Tel: +353-45-980588, Fax: +353-45-980587, e-mail: envirm@kildarecoco.ie <b>DIRECTOR OF SERVICES:</b> JOE BOLAND <b>SENIOR ENGINEER:</b> MICHAEL HOLLIGAN	<b>DRAWING:</b> Carrigeen Refuse Depot, Clane
	<b>Scale:</b> 1: 2,500 <b>Date:</b> May 2010 <b>Drawn by:</b> D.O.B.





<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites	<b>DRAWING NUMBER:</b> ERA / C / AER	
	<b>PROJECT:</b> Aerial Mapping	
<b>KILDARE COUNTY COUNCIL</b> <b>Environment Section</b> Áras Chill Dara, Devoy Park, Naas, Co. Kildare. Tel: +353-45-980588, Fax: +353-45-980587, e-mail: <a href="mailto:envirm@kildarecoco.ie">envirm@kildarecoco.ie</a> <b>DIRECTOR OF SERVICES:</b> JOE BOLAND <b>SENIOR ENGINEER:</b> MICHAEL HOLLIGAN	<b>DRAWING:</b> Carrigeen Refuse Depot, Clane	
	<b>Scale:</b> 1: 5,000	<b>Date:</b> May 2010
	<b>Drawn by:</b> D.O.B.	





**NOTES:**

1. Mapping shown above is an Aerial Photograph of the Carrigeen area taken for mapping purposes on 15th May 1973

**TITLE:**

Environmental Risk Assessment for Unregulated Waste Disposal Sites

**DRAWING NUMBER:**

ERA / C / HOM



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**DIRECTOR OF SERVICES:** JOE BOLAND  
**SENIOR ENGINEER:** MICHAEL HOLLIGAN

**PROJECT:**

Historical Ordnance Mapping

**DRAWING:**

Carrigeen Refuse Depot, Clane

**Scale:**

N.T.S.

**Date:**

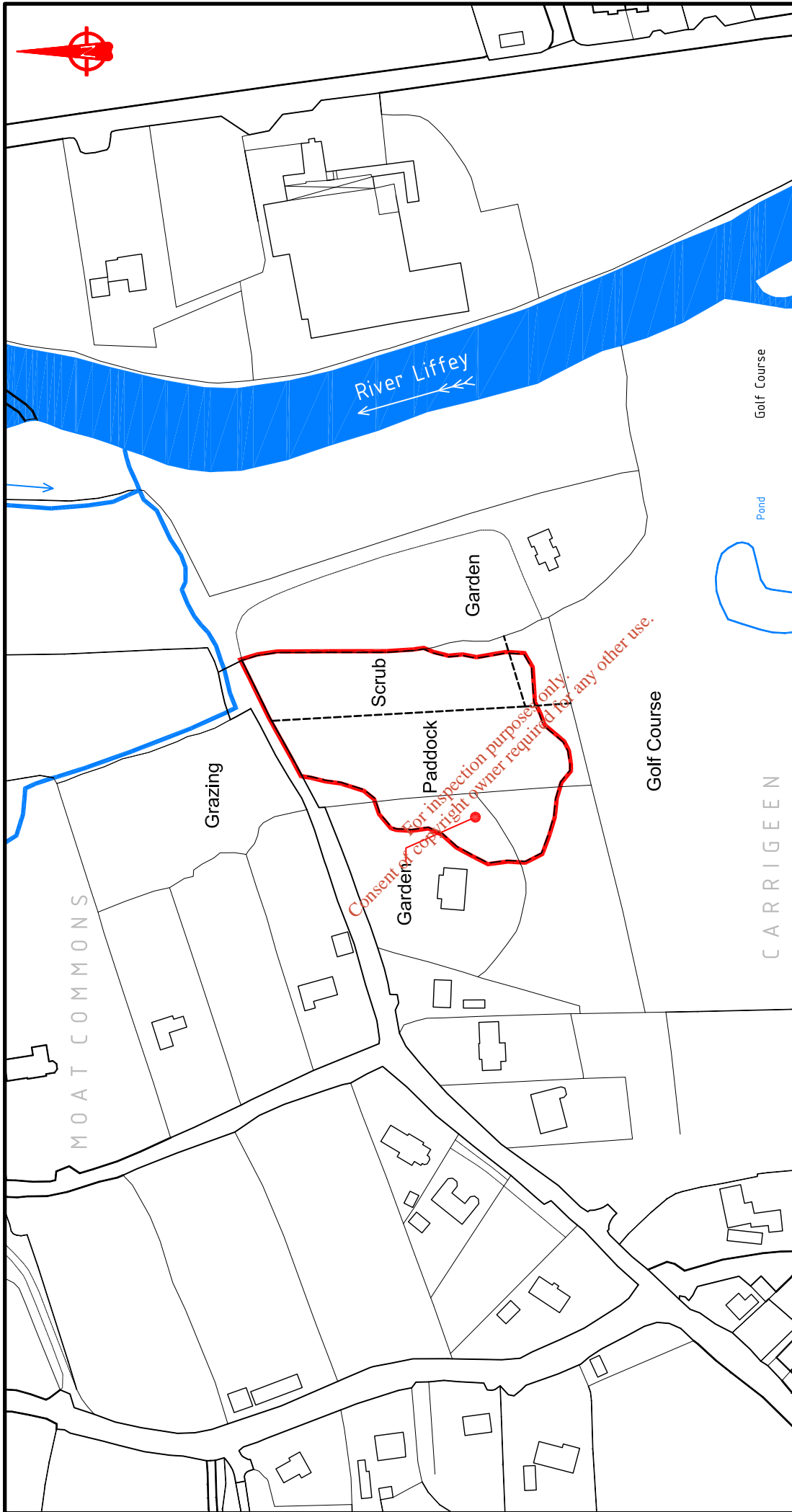
May 2010

**Drawn by:**

D.O.B.

## **Appendix 3: Landuse**

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<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites	<b>DRAWING NUMBER:</b> ERA / C / LU		
	<b>PROJECT:</b> Land Use Map		
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	<b>Scale:</b> 1: 2,500		
			

## **Appendix 4: Risk Screening and Prioritisation**

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**Site : Carrigeen, Clane**

Table	Score	Rationale
1a: Leachate Hazard	5	Municipal waste landfilled between 1977 and 1980 of <1ha.
1b: Landfill Gas Hazard	5	Municipal waste landfilled between 1977 and 1980 of <1ha.
2a: Leachate Migration - GW Vulnerability	3	Extreme vulnerability due to bedrock.
2b: Leachate Migration - GW Flow Regime	1	Poorly productive bedrock groundwater body. (LI)
2c: Leachate Migration - SW Drainage	2	Leachate runoff to stream which in turn discharges to the Liffey.
2d: Landfill Gas - Lateral Migration	2	Bedrock. Nearest dwelling 7.5m from waste body.
2e: Landfill Gas - Vertical Migration	0	Receptor not located above waste body.
3a: Leachate Migration - Human Presence	3	Nearest dwelling 7.5m from waste body.
3b: Leachate Migration - Protected Area	0	There are no protected areas within 1km of the waste body.
3c: Leachate Migration - Aquifer Category	3	LI, Locally important aquifer.
3d: Leachate Migration - Public Water Supply	0	No public water supply within 1km and not a karst aquifer.
3e: Leachate Migration - Surface Water Bodies	3	Leachate runoff to stream 6.5m from waste body, which in turn discharges to the Liffey.
3f: Landfill Gas - Human Presence	5	Nearest dwelling 7.5m from waste body.

**SPR (Source Pathway Receptor) Linkage**

- SPR 1= 1a X (2a + 2b + 2c) X 3e
- SPR 2= 1a X (2a + 2b + 2c) X 3b (SWDTE)
- SPR 3= 1a X (2a + 2b) X 3a
- SPR 4= 1a X (2a + 2b) X 3b
- SPR 5= 1a X (2a + 2b) X 3c
- SPR 6= 1a X (2a + 2b) X 3d
- SPR 7= 1a X (2a + 2b) X 3e
- SPR 8= 1a X 2c X 3e
- SPR 9= 1a X 2c X 3b (SWDTE)
- SPR 10= 1b X 2d X 3f
- SPR 11= 1b X 2e X 3f

	Site score	Max score	%
<b>SPR 1:</b>	90	300	30.00%
<b>SPR 2:</b>	0	300	0.00%
<b>SPR 3:</b>	60	240	25.00%
<b>SPR 4:</b>	0	240	0.00%
<b>SPR 5:</b>	60	400	15.00%
<b>SPR 6:</b>	0	560	0.00%
<b>SPR 7:</b>	60	240	25.00%
<b>SPR 8:</b>	30	60	50.00%
<b>SPR 9:</b>	0	60	0.00%
<b>SPR 10:</b>	50	150	33.33%
<b>SPR 11:</b>	0	250	0.00%

**Moderate Risk (Class B)**

# Site: Carrigeen, Clane

Table 1a: LEACHARE: SOURCE/HAZARD SCORING MATRIX

WASTE TYPE	WASTE FOOTPRINT (ha)		
	≤ 1 ha	>1 ≤ 5 ha	> 5 ha
C&D <sup>20</sup>	0.5	1	1.5
Municipal <sup>21</sup>	5	7	10
Industrial <sup>22</sup>	5	7	10
Pre 1977 sites <sup>23</sup>	1	2	3
		Max	10

1a 5

Table 1b: LANDFILL GAS: SOURCE/HAZARD SCORING MATRIX

WASTE TYPE	WASTE FOOTPRINT (ha)		
	≤ 1 ha	>1 ≤ 5 ha	> 5 ha
C&D <sup>20</sup>	0.5	1	1.5
Municipal <sup>21</sup>	5	7	10
Industrial <sup>22</sup>	5	7	10
Pre 1977 sites <sup>23</sup>	1	2	3
		Max	10

1b 5

Table 2a: LEACHATE MIGRATION: PATHWAYS

Parameter	Points available
GROUNDWATER FLOW REGIME (Vertical Pathway)	
Extreme Vulnerability	3
High Vulnerability	2
Moderate Vulnerability	1
Low Vulnerability	0.5
High - Low Vulnerability	2

2a 3

Table 2b: LEACHATE MIGRATION: PATHWAYS

Parameter	Points available
GROUNDWATER FLOW REGIME (Horizontal Pathway)	
Karstified Groundwater bodies (Rk)	5
Productive Fissured Bedrock Groundwater Bodies (Rf and Lm)	3
Gravel Groundwater bodies (RG and Lg)	2
Poorly Productive Bedrock Ground Water Bodies (LI, PI, PU)	1

2b 1

Table 2c: LEACHATE MIGRATION: PATHWAYS

Parameter	Points available
SURFACE WATER DRAINAGE (surface water pathway)	
Is there a direct connection between drainage ditches associated with the waste body and adjacent surface water body? Yes	2
If no direct connection	0

2c 2

Table 2d: LANDFILL GAS: PATHWAY assuming receptor within 250m of source

Parameter	Points available
<b>LANDFILL GAS LATERIAL MIGRATION POTENTIAL</b>	
Sand and gravel, Made ground, urban, Karst	3
Bedrock	2
All other Tills (including limestone, sandstone etc - moderate Permeability)	1.5
All Namurian or Irish Sea Tills (low permeability)	1
Clay, Alluvium, Peat	1

2d	2
----	---

Table 2e: LANDFILL GAS: PATHWAY assuming receptor located above source

Parameter	Points available
<b>LANDFILL GAS LATERIAL MIGRATION POTENTIAL</b>	
Sand and gravel, Made ground, urban, Karst	5
Bedrock	3
All other Tills (including limestone, sandstone etc - moderate Permeability)	2
All Namurian or Irish Sea Tills (low permeability)	1
Clay, Alluvium, Peat	1

2e	0
----	---

Table 3a: LEACHATE MIGRATION: RECEPTORS

Parameter	Points available
<b>HUMAN PRESENCE (presence of a house indicates potential private well)</b>	
On or within 50m of waste body	3
Greater than 50m but less than 250m of the waste body	2
Greater than 250m but less than 1km of the waste body	1
Greater than 1km of the waste body	0

3a	3
----	---

Table 3b: LEACHATE MIGRATION: RECEPTORS

Parameter	Points available
<b>PROTECTED AREAS (SWDTE or GWDTE)</b>	
On or within 50m of waste body	3
Greater than 50m but less than 250m of the waste body	2
Greater than 250m but less than 1km of the waste body	1
Greater than 1km of the waste body	0
Undesignated sites within 50m of waste body	1
Undesignated sites greater than 50m but less than 250m of the waste body	0.5
Undesignated sites greater than 250m of the waste body	0

3b	0
----	---



Table 3c: LEACHATE MIGRATION: RECEPTORS

Parameter	Points available
<b>AQUIFIER CATEGORY (resource potential)</b>	
Regionally Important Aquifer (Rk, Rf, Rg)	5
Locally Important Aquifer (Ll, Ll, Ll)	3
Poor Aquifer (Pl, Pu)	1

3c	3
----	---

Table 3d: LEACHATE MIGRATION: RECEPTORS

Parameter	Points available
<b>PUBLIC WATER SUPPLY (other than private wells)</b>	
Within 100m of site boundary	7
Greater than 100m but less than 300m or within Inner SPA (SI) for GW supplies	5
Greater than 300m but less than 1km or within Outer SPA (SO) for GW supplies	3
Greater than 1km (karst aquifer)	3
Greater than 1km (no karst aquifer)	0

3d	0
----	---

Table 3e: LEACHATE MIGRATION: RECEPTORS

Parameter	Points available
<b>SURFACE WATER BODIES</b>	
Within 50m of site boundary	3
Greater than 50m but less than 250m	2
Greater than 250m but less than 1km	1
Greater than 1km	0

3e	3
----	---

Table 3f: LANDFILL GAS: RECEPTORS

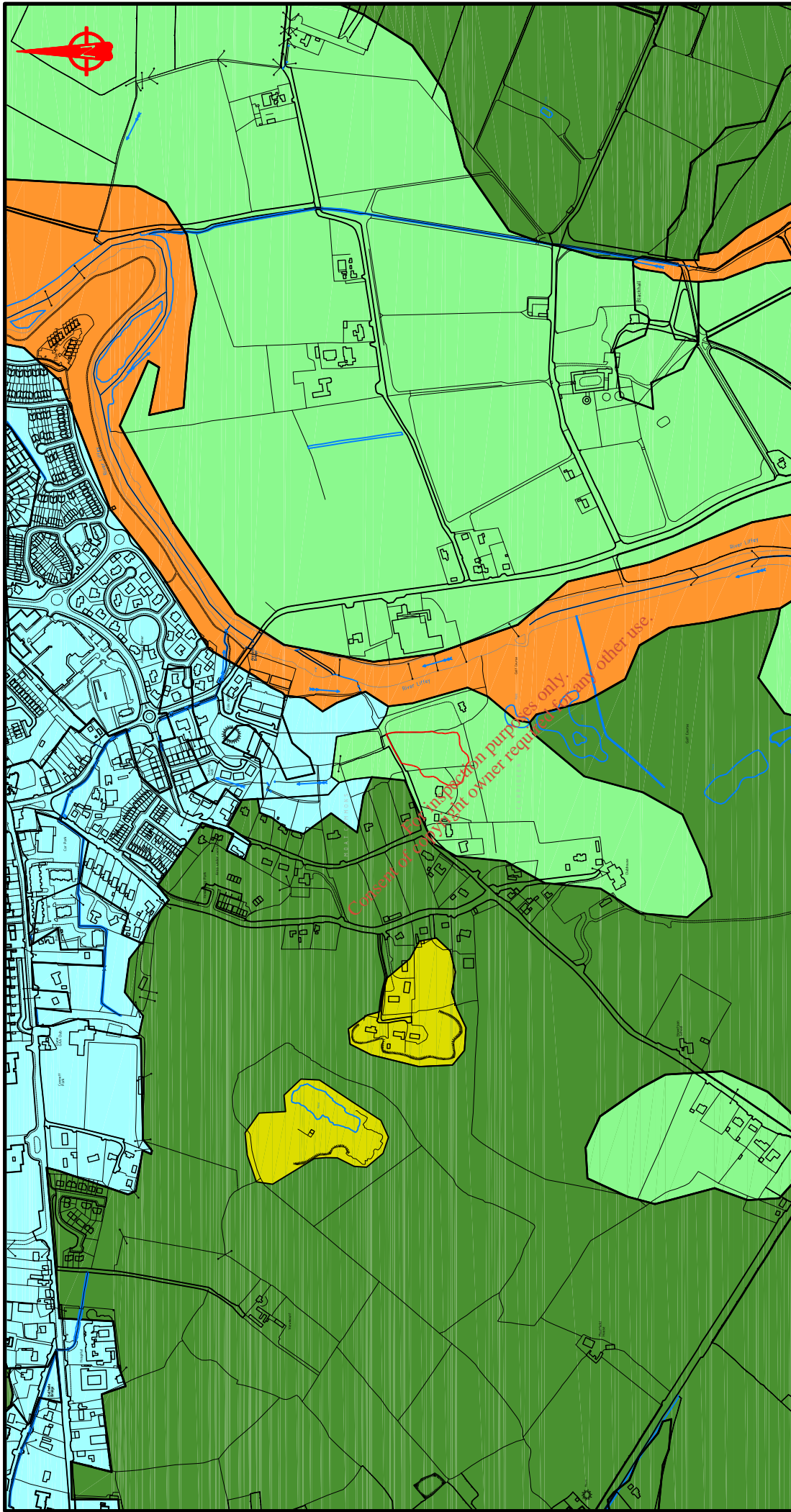
Parameter	Points available
<b>HUMAN PRESENCE</b>	
On site or within 50m of site boundary	5
Greater than 50m but less than 150m	3
Greater than 150m but less than 250m	1
Greater than 250m	0.5

3f	5
----	---


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## Appendix 5: Geology

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- LEGEND:**
- Made or built-over ground
  - TLs - Limestone till (Carboniferous)
  - A - Alluvium
  - GLs - Limestones sands and gravels (Lower Carboniferous)
  - Rck - Bedrock at surface

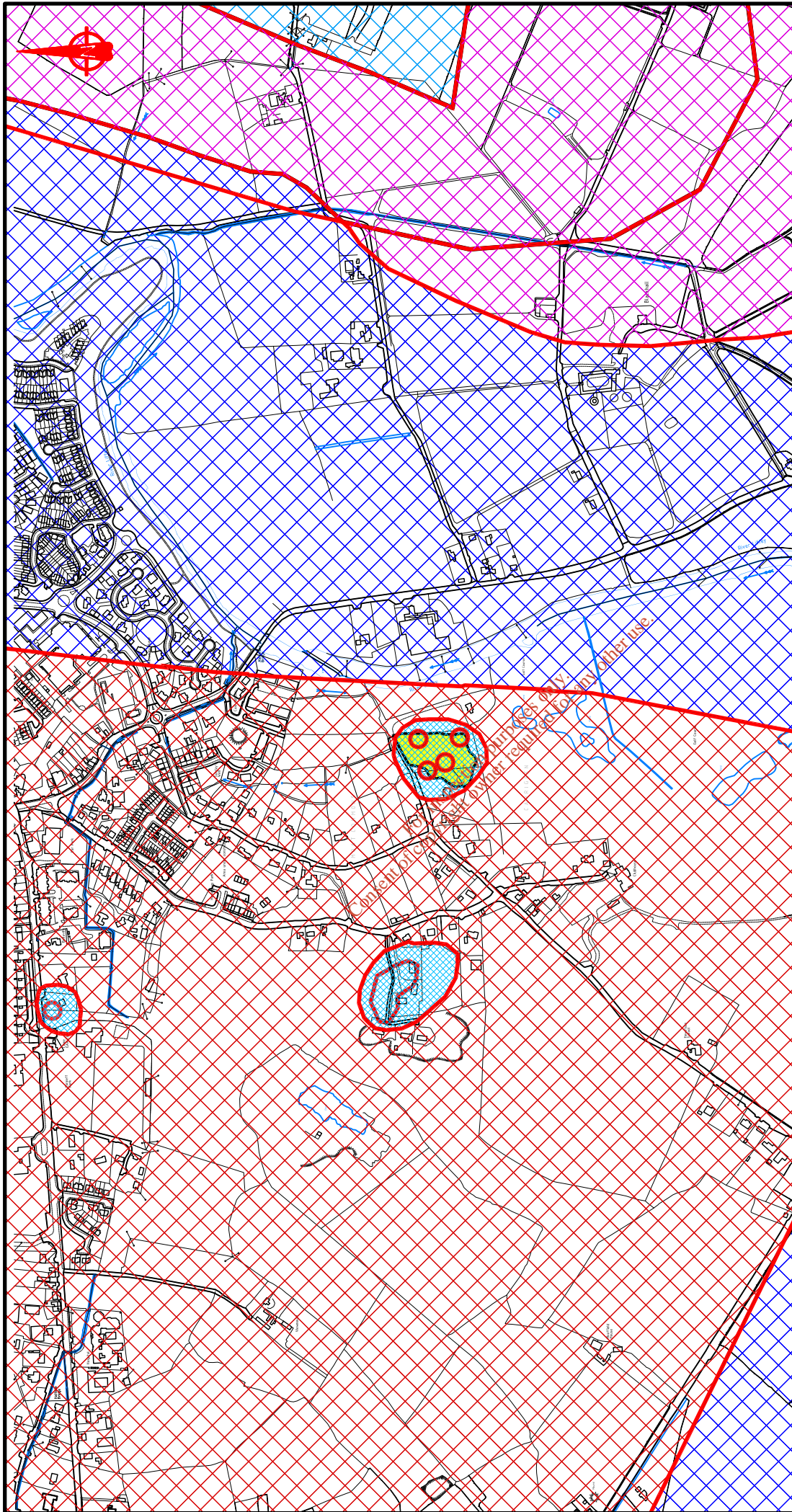
<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites	<b>DRAWING NUMBER:</b> ERA / C / SSO
<b>PROJECT:</b> Subsoil Map	
<b>DRAWING:</b> Carrigeen Refuse Depot, Clane	
<b>Scale:</b> 1: 10,000	<b>Date:</b> May 2010
<b>Drawn by:</b> D.O.B.	
	
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<b>LEGEND:</b> Extreme Groundwater Vulnerability Status (E) Outcrop/Shallow Rock (E)	<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites	<b>DRAWING NUMBER:</b> ERA / C / RO
	<b>PROJECT:</b> Rock Outcrop Map <b>DRAWING:</b> Carrigeen Refuse Depot, Clane	<b>Scale:</b> 1: 5,000 <b>Date:</b> May 2010 <b>Drawn by:</b> D.O.B.
<p> <b>KILDARE COUNTY COUNCIL</b>  <b>Environment Section</b>          Áras Chill Dara, Devoy Park, Naas, Co. Kildare.          Tel: +353-45-980588, Fax: +353-45-980587, e-mail: <a href="mailto:envinm@kildarecoco.ie">envinm@kildarecoco.ie</a>  <b>DIRECTOR OF SERVICES:</b> JOE BOLAND  <b>SENIOR ENGINEER:</b> MICHAEL HOLLIGAN       </p>		

# Appendix 6: Groundwater Vulnerability Map

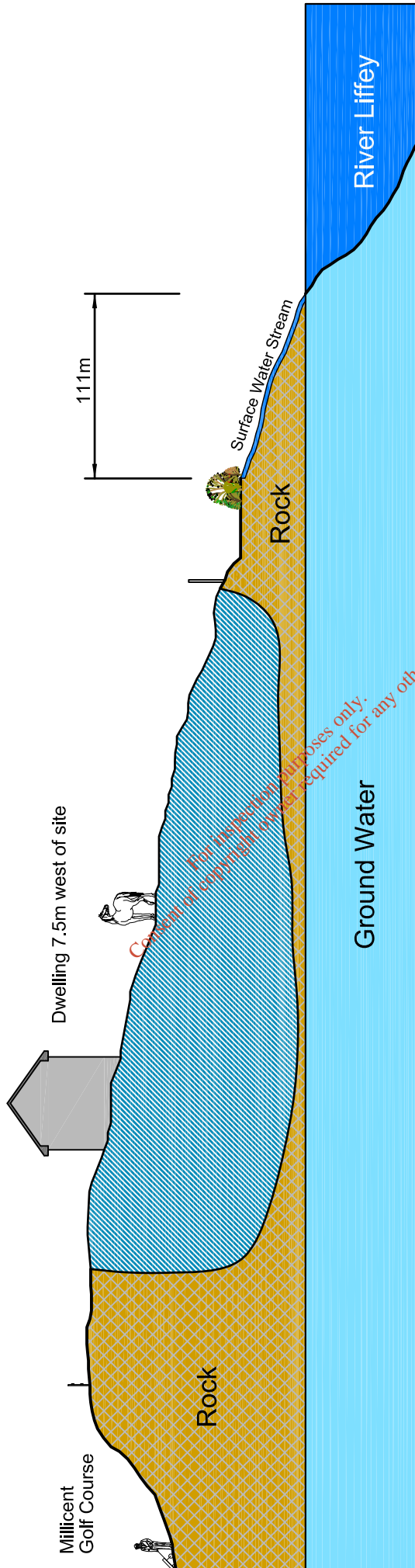
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<b>LEGEND:</b>  	<b>TITLE:</b> Environmental Risk Assessment for Unregulated Waste Disposal Sites		<b>DRAWING NUMBER:</b> ERA / C / GW
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# Appendix 7: Conceptual Model Cross Section

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TITLE: Environmental Risk Assessment for Unregulated Waste Disposal Sites	DRAWING NUMBER: ERA / C / CON	
	PROJECT: Conceptual Site Model	
 <p><b>KILDARE COUNTY COUNCIL</b>  <b>Environment Section</b>          Áras Chill Dara, Devoy Park, Naas, Co. Kildare.          Tel: +353-45-980588, Fax: +353-45-980587, e-mail: <a href="mailto:envirm@kildarecoco.ie">envirm@kildarecoco.ie</a>  <b>DIRECTOR OF SERVICES: JOE BOLAND</b>  <b>SENIOR ENGINEER: MICHAEL HOLLIGAN</b></p>	DRAWING: Carrigeen Refuse Depot, Clane	
	Scale: N.T.S.	Date: May 2010



## Appendix 8: Cost Estimate

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Scope of Works for Tier 2 Environmental Site Assessment (Exploratory Stage) - Carrigeen, Clane, Co. Kildare

Task	Costs (€)	Comment
Professional Fees	€4,400	<p>Site supervision</p> <p>Logging of trial pits and boreholes</p> <p>Preparation of waste characterisation table (record biodegradable and non-biodegradable fraction)</p> <p>Groundwater well development</p> <p>Soil, groundwater and surface water sampling</p> <p>Gas monitoring (2 rounds including 1 round during falling atmospheric pressure event)</p> <p>Preparation of interpretative report</p>
Trial pitting (carry out this task before drilling)	€700	<p>Provide for 13 tonne excavator to achieve depths of up to 5.0 metres below ground level</p> <p>Minimum 9 no. in waste body across disturbed ground up to 5.0 metres below ground level</p> <p>4 no. in adjoining paddock to ca. 0.5 metres below ground level to observe capping properties</p>
Drilling costs	€5,300	<p><b>Combined gas/leachate wells (assume base of waste is ca. 5 metres, overburden of ca. 2.0 metres):</b></p> <p>1 No. upgradient in overburden/shallow bedrock to nominal depth of 8.0 metres (ideally between waste body &amp; residence if significant biodegradable fraction observed in waste)</p> <p>2 No. downgradient in overburden/shallow bedrock to nominal depth of 8.0 metres</p> <p>2 No. in-waste to nominal depth of 6.0 metres (overburden only)</p> <p>(Example drilling rig is a CME-55 rig or similar, which can advance in bedrock with rotary core/air rotary. Tracked machine likely to be needed for rough terrain).</p>
Laboratory Costs	€3,000	<p>6 No. groundwater/leachate samples @ ca. €200/sample = €1,200</p> <p>6 No. soils for geotechnical properties @ ca. €100 = €600</p> <p>3 No. soils for Council Decision 2003/33/EC WAC Testing @ ca. €200/sample = €600</p> <p>3 No. surface water samples @ ca. €200/sample = €600</p>
Expenses	€500	<p>Equipment hire, consumables, mileage, printing, telephone costs etc.</p>
<b>Total (ex. VAT)</b>	<b>€13,900</b>	
<b>Additional Costs (Optional)</b>		
Geophysical Survey	€3,800	<p>2D Resistivity (1 day, minimum 2 lines plus processing)</p> <p>EM31 (1 day plus processing)</p> <p>Should be carried out if trail pitting does not determine base of waste body</p>



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# Appendix 9: Walkover Survey Checklist

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# Carrigeen Refuse Depot, Clane

# ENVIRONMENT SECTION

## Walkover Survey Checklist



## Section 22 – Waste Management Act 1996

<b>Walkover Survey Checklist</b>		
<b>Information</b>	<b>Checked</b>	<b>Comment (include distances from site boundary)</b>
1. What is the current Land Use?		Garden, paddock for ponies and scrub / disused area.
2. What are the neighbouring Land Uses		Residential with two dwellings, one 7.5m west and the other 40m south east of the waste body. Grazing for ponies above the waste body and across the road. River Liffey 85m to the east of the site. Millicent Golf Course to the south of the site.
3. What is the size of the site		0.979 Hectares
4. What is the topography?		High point to the southern end of the site sloping down to the cul de sac access road to the north. Very uneven with large depressions in the area of scrub / disused land to the east.
5. Are there potential receptors (if yes, give details)?		Yes
Houses		Yes. Two dwellings one 7.5m and the other 40m from waste body.
Surface water features ( if yes, distance and direction of flow)		Stream 6.5m north of waste body flowing east a distance 111m to the River Liffey. On plan, landfill is 85m from the River Liffey.
Any wetland or protected areas		No
Public Water Supplies		Mains water.
Private Wells		No
Services		No
Other Buildings		No
Other		
6. Are there any potential sources of contamination (if yes, give details)?		
Surface waste (if yes, what type?)		Small amount of C & D waste evident.
Surface ponding of leachate		Yes. Immediately inside northern roadside boundary.

Leachate seepage		Yes. During months of heavy rainfall leachate ponding inside the boundary overflows onto cul de sac and flows across road a distance 6.5m to a stream which discharges to the Liffey.
Landfill gas odours		No.
7. Are there any outfalls to surface water? ( if yes, are there discharges and what is the nature of the discharge)		Yes. Red coloured leachate overflows onto cul de sac and enters stream which discharges to Liffey.
8. Are there any signs of impact on the environment? (If yes, take photographic evidence)		Leachate discharging to stream which discharges to the Liffey. Also aesthetically unacceptable to the public. (See Appendix 1 Photo 9 & 10)
Vegetation die off bare ground		Dead vegetation in areas of ponding in winter months.
Leachate seepages		Reddish leachate evident at northern boundary during winter months.
Odours		No
Litter		No
Gas bubbling through water		No
Signs of settlement, subsidence, water logged areas		Records of depressions in capping layer shortly after capping in 1981. Large depressions are visible in the scrub land and could be attributed to settlement and soil moved to make mounds for quad biking in the past.
Drainage or hydraulic issues		Poor drainage at the northern side of site with ponding evident during winter months.
Downstream water quality appears poorer than upstream water quality		Yes
9. Are there any indication of remedial measures? (Provide details)		
Capping		Records of 450mm of a gravelly, clayey material was used to cap the site in 1981.
Landfill gas collection		No
Leachate collection		No
10. Describe fences and security features (if any)		Agricultural access gate on northern boundary plus chain link fence. Timber post and rail fencing along western and southern boundary. Mixed hedgerow along eastern boundary.
Any other relevant information		The issue of a red leachate flowing across the cul de sac has given rise to complaints from the public and their representatives.