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CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX 1

Tier 1 Study

Comhairle Contae Chiarraí

Kerry County Council

Tier 1 Review Report – Leanmore

S22 - 02666

November 2013

Prepared by:

Environmental Services,
Kerry County Council.

Seirbhísí Comhshaoil,
Comhairle Contae Chiarraí.

1.0 Contents.

2.0 Introduction.

In 2007 an initial Tier 1 Risk Assessment of all identified unregulated waste disposal sites was undertaken by the Environment Section of Kerry County Council.

The assessment was completed on foot of;

- the Ministerial Direction (WIR 04/05) reminding Local Authorities of their responsibilities under Section 22 of the Waste Management Acts, 1996 to 2005
- the Environmental Protection Agency's Code of Practice (CoP) - Environmental Risk Assessment for Unregulated Waste Disposal Sites.

The site was subsequently registered on the EPA Section 22 Register and given the reference code S22-02656. It was assigned a Moderate Risk (Class B) classification.

A copy of the assessment is included in Attachment No 1 for reference.

This report updates the initial assessment taking cognisance of the guidance within the CoP to review sites on an annual basis and in light of SI 524 of 2008, Waste Management (Certification of Historic Unlicenced Waste Disposal and Recovery Activity) Regulations 2008.

3.0 Risk Assessment Methodology – Tier 1

3.1 Introduction

Tier 1 of the Risk Assessment Methodology - Conceptual Site Model, Risk Screening and Prioritisation includes a preliminary investigation of the site and also comprises the development of a Conceptual Site Model using information obtained from the desk study and site inspection.

The Conceptual Site Model outlines the different Source-Pathway-Receptor (SPR) linkages and provides information for the risk-screening element. The information gleaned from the desk appraisal and walk over survey is summarised in the Attachment No 6.1

3.2 Risk Screening

Risk screening represents an assessment of the SPR linkages in the conceptual model. The Conceptual Site Model identifies each of the elements of the linkage present for the site and the associated uncertainty.

The Conceptual Site Model will determine whether a site represents (or potentially represents) an unacceptable intrinsic risk to any receptor.

The risk that is being assessed is the intrinsic risk that the activity poses without any mitigation measures having been put in place. The actual risk posed to the environment will be reduced following remediation measures.

3.3 Desk Study (Tier 1 Risk Assessment)

A desk study of the site has been undertaken. The information has been gathered from various sources including:

- Local authority sources including records and interview,
  - ground water vulnerability maps
  - surface water channels
  - aquifer data
  - sources of public water supplies

    - NHA, SAC, SPA register map
- Section 22 register (existing)
- Waste Plans
- Complaints database
- Permit register
- EPA waste reports (including NWD report)
- EPA IPPC facilities
- EPA waste licenced facilities
- An Foras Forbatha reports
- Aerial photography

3.4 Walk Over Survey.

A walk over survey has been conducted on the identified site.

The results have been recorded in Attachment 6.1 and the allocation of scores to the Risk Prioritisation exercise has been amended accordingly.

Typical photographs of the site are included in Attachment 6.2.

4.0 Site Summary.

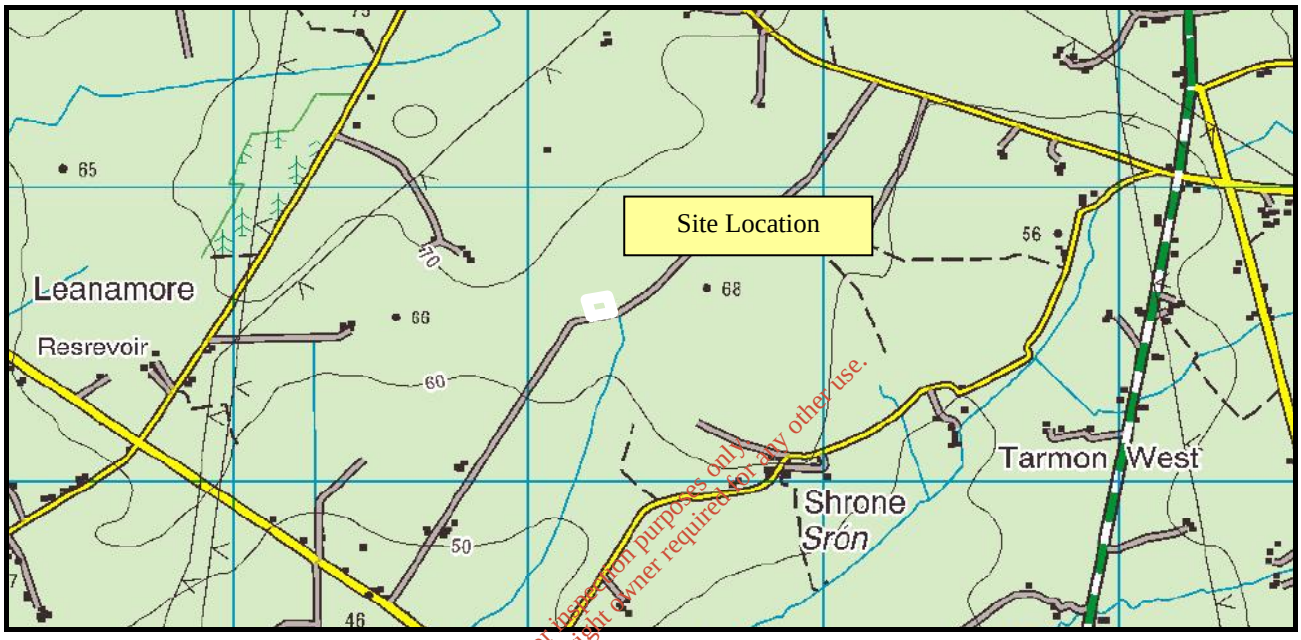
4.1 Location.

The unregulated closed site is located in the townland of Leanamore, Ballylongford.

The site is bounded to the south by a local tertiary road and on all sides by agricultural and bog lands.

The site is known as Leanamore landfill.

Site Location



4.2 Site Layout and extent of waste.

The exact footprint of the waste as placed is as yet unknown pending further investigations.

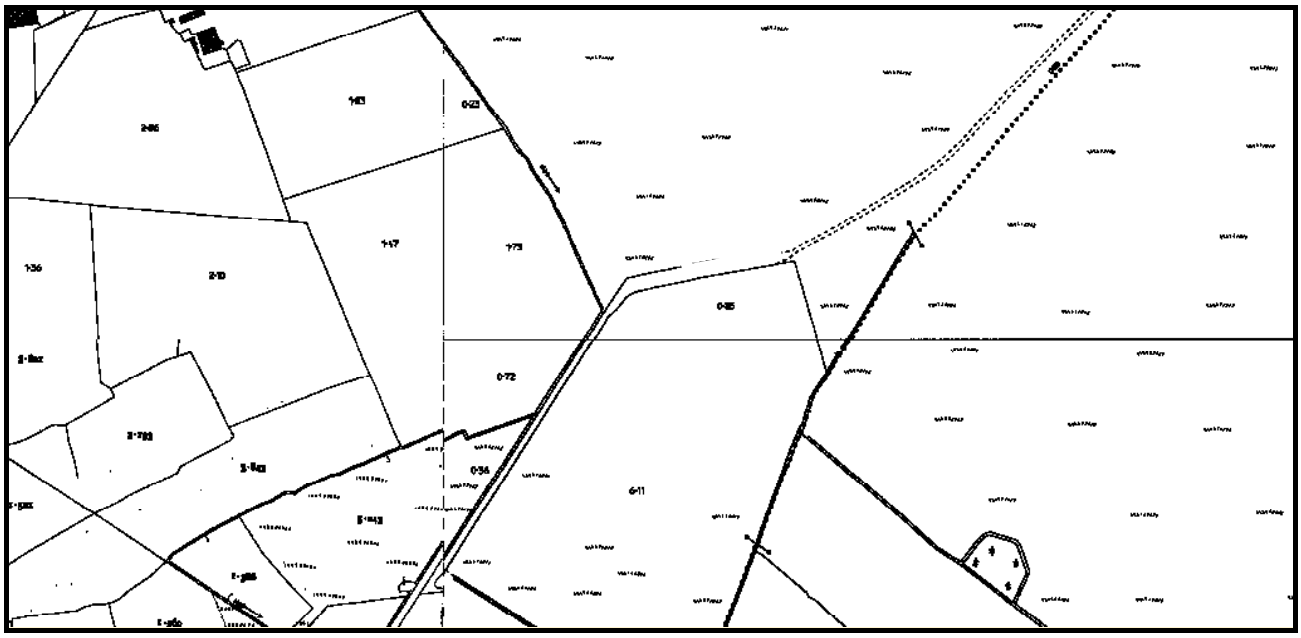
The extent is therefore taken as the full area of the property holding in which the activity took place which is approximately 4,000m^2.

The grid reference to the approximate centre of the property holding is 104231, 143590

The following layout map outlines the surrounding land use and geographic features.

The site is in the absolute private ownership (details on file) – part of Folio 13755F.

Site Layout



Waste activities had ceased before the completion of the 1998 Waste Management Plan for Kerry and commenced some time after the 1986 An Foras Forbartha report.

There is no reference in the An Foras Forbartha report on National Database on Waste.

Using the data above and assuming the footprint of the waste matches that of the property holding and that the depth varies from 3 – 4 m in depth the volumes deposited could be in the region of 12,000 to 16,000 tonnes.

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 1A and 1B	Score 5

4.2 Available Aerial Photography

There are some sets of available aerial photography from 1995 to 2004. These are presented in the following pages

Aerial Photography - 2004

Aerial Photography - 2000

Aerial Photography - 1995

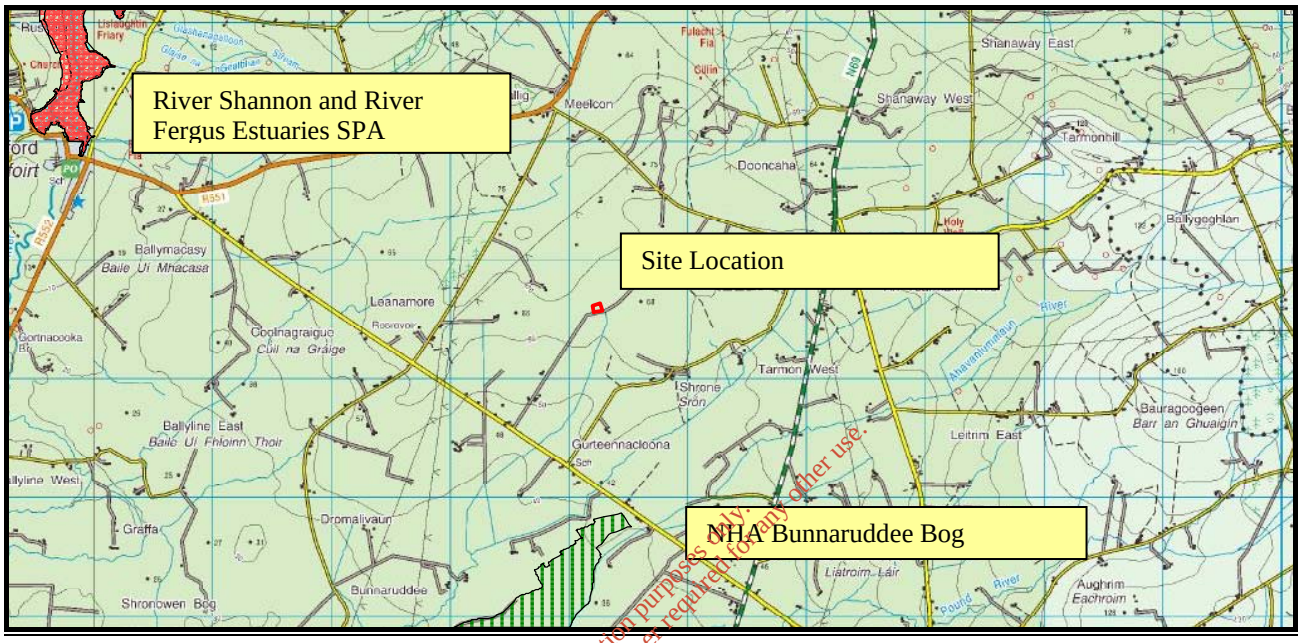
Aerial Photography – Year unknown (source GSI).

4.4 Designated Sites

The site is 1.67 km north of the Bunnaruddee Bog NHA and 4.5km east of the River Shannon and River Fergus Estuaries SPA.

The designation is current to September 2011.

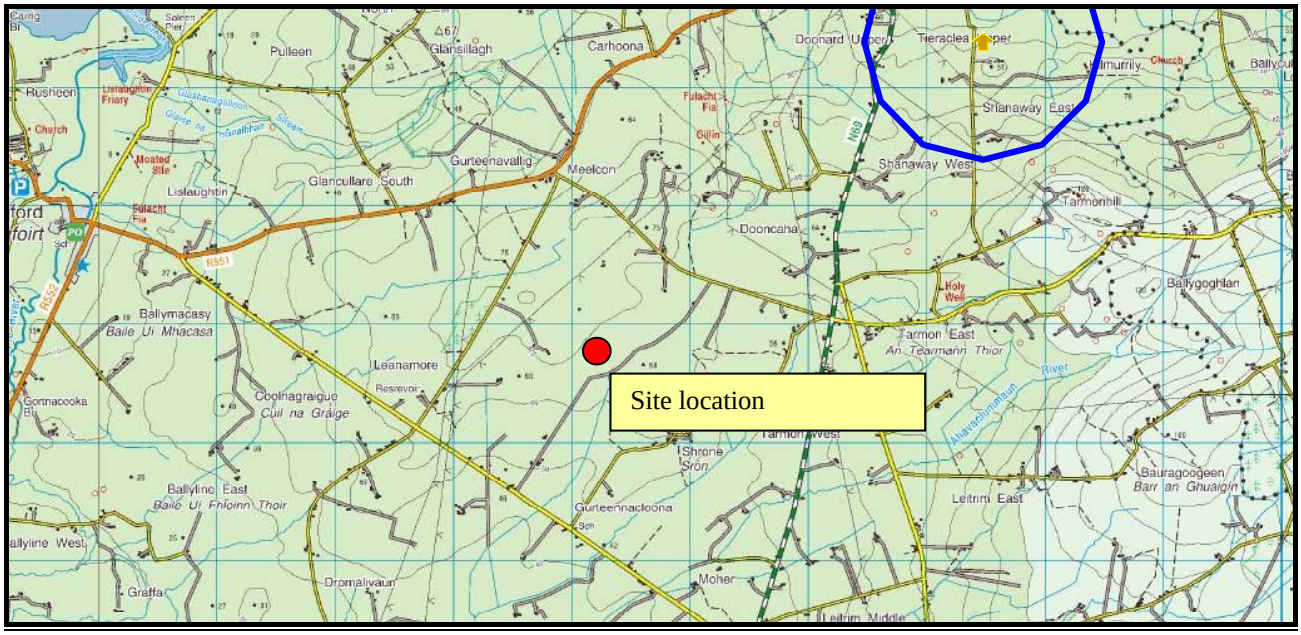
Designated Sites



Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 3B	Score 0

4.5 Water Resources

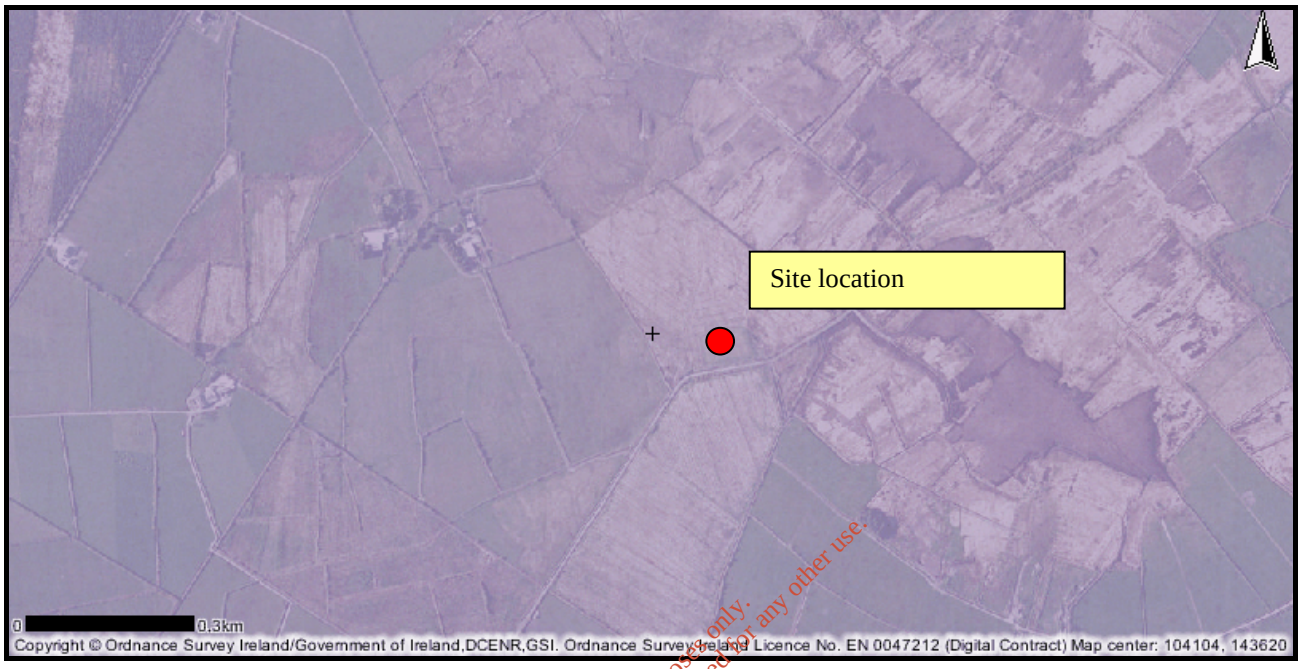
The site is not located within or close to any Source Protection Area. It is 3.3 km from the edge of the nearest buffer zone.



Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 3D	Score 0

4.6 Groundwater vulnerability and aquifer

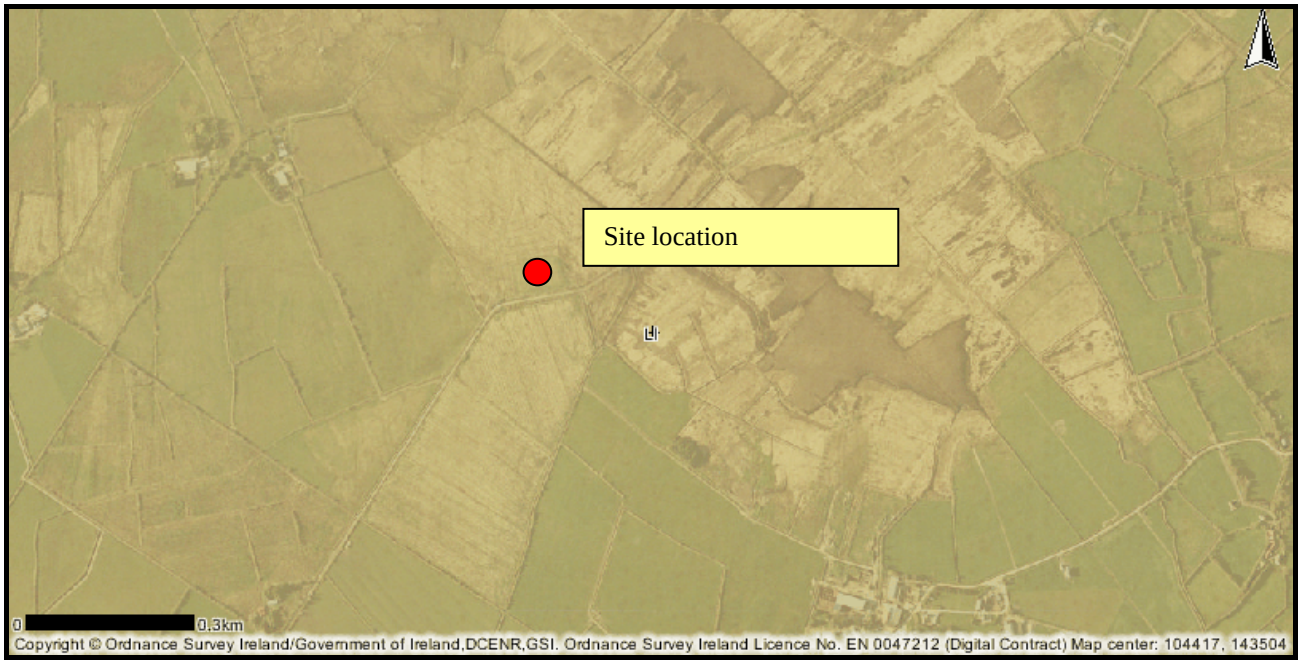
Groundwater Vulnerability



The site is located in an area that is no definitive designation (HL) – it is taken as high vulnerability.

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 2A	Score 2

Aquifer Status

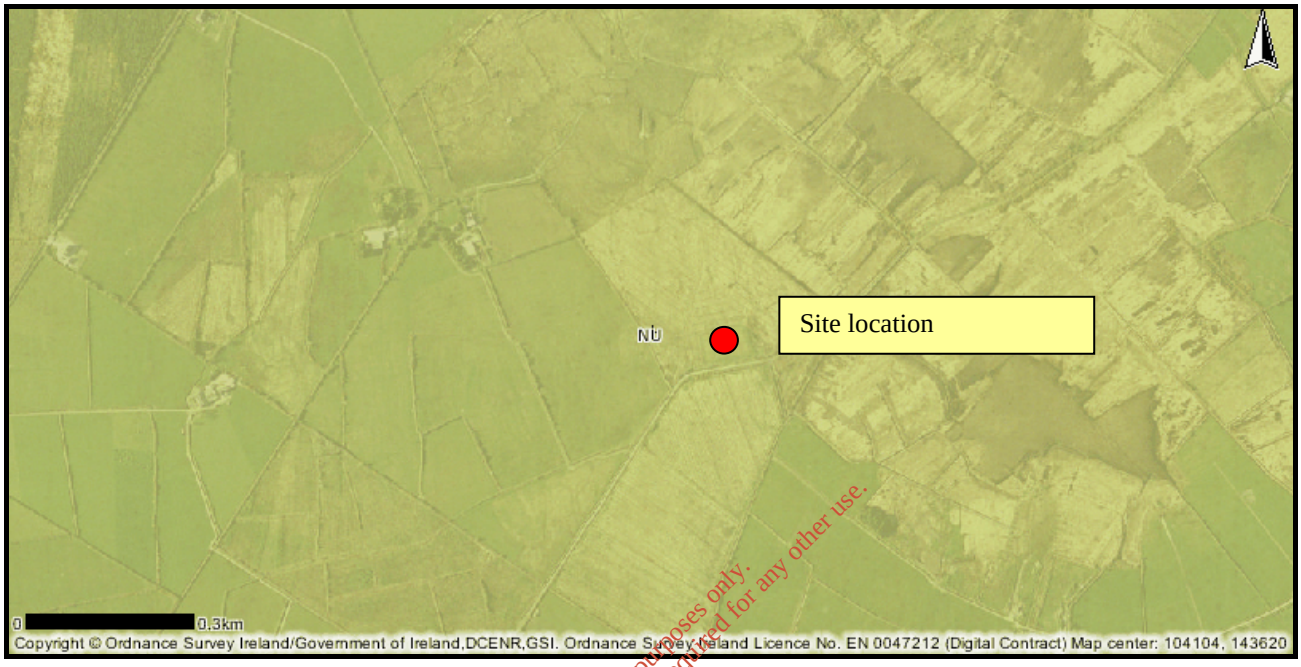


The LI status implied that the bedrock aquifer is moderately productive only in local zones.

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 3C	Score 3

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 2B	Score 1

Bedrock Geology



4.7 Surface water.

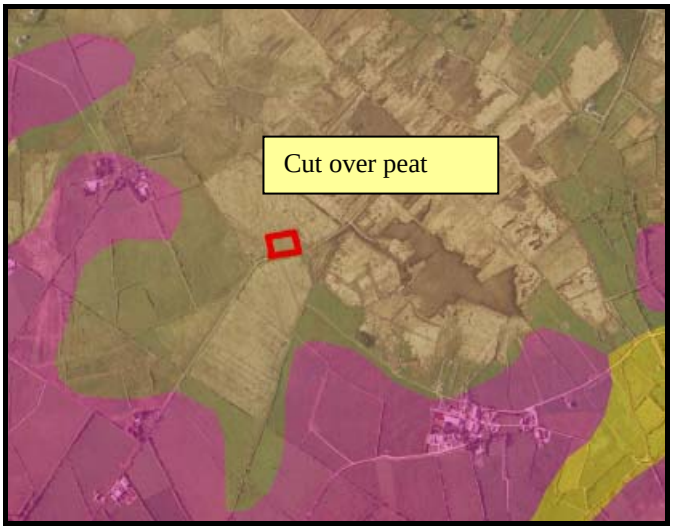
There is a ditch draining to a watercourse to the south east – the ditch bounds the site, the watercourse is adjacent to the site.

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 2C	Score 2

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 3E	Score 0

Soil Types

Sub-soil Categorisation



4.8 Landfill Gas

The closest domestic dwellings is approximately 400 m from the site.

There is no dwelling above the footprint of the waste.

Passive vents are in evidence on the ground with no noticeable odour.

Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 2D	Score 1
Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 2E	Score 0
Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 3A	Score 1
Based on the above this score is used in the Risk Assessment (see Appendix 1)	Table 3F	Score 0.5

5.0 Conclusions.

Summary of Risk Screening

The following tables set out the scores used in the risk screening exercise and the results of that exercise.

Summary of Risk Screening Scores

	Table	Description	Score
Source	1A	Leachate; source/hazard scoring matrix	5.0
	1B	Landfill gas; source/hazard scoring matrix	5.0
Pathway	2A	Leachate migration; pathways (gw vulnerability)	2.0
	2B	Leachate migration; pathways (gw flow)	1.0
	2C	Leachate migration; pathways (sw pathway)	2.0
	2D	Landfill gas; lateral migration	0.0
	2E	Landfill gas; upward migration	1.0
Receptpor	3A	Leacahte migration; receptors, human	1.0
	3B	Leacahte migration; receptors, protected areas	0.0
	3C	Leacahte migration; receptors, acquifers	3.0
	3D	Leacahte migration; receptors, puiblic water supply	0.0
	3E	Leacahte migration; receptors, surface water	0.0
	3F	Landfill gas; receptor, human presence	0.5

Summary of SPR Linkages.

		SPR score	Max	Normalised	Risk
SPR 1	1a * (2a + 2b + 2c) * 3e	0	300	0%	LOW
SPR 2	1a * (2a + 2b + 2c) * 3b	0	300	0%	LOW
SPR 3	1a * (2a + 2b) * 3a	15	240	6%	LOW
SPR 4	1a * (2a + 2b) * 3b	0	240	0%	LOW
SPR 5	1a * (2a + 2b) * 3c	45	400	11%	LOW
SPR 6	1a * (2a + 2b) * 3d	0	560	0%	LOW
SPR 7	1a * (2a + 2b) * 3e	0	240	0%	LOW
SPR 8	1a * 2c * 3e	0	60	0%	LOW
SPR 9	1a * 2c * 3b	0	60	0%	LOW
SPR 10	1b * 2d *3f	0	150	0%	LOW
SPR 11	1b * 2e *3f	3	250	1%	LOW

Based on the above assessment this is a LOW RISK CLASS C Site

Based upon the desktop appraisal and walk over survey the calculated risk associated with this site is LOW.

6.0 Attachments

6.1 Risk Screening, Information Sources and Walk Over Survey
6.2 Typical Photographs (walk over survey, 2013)
6.3 Risk Assessment 2007

Site Reference **S22 - 02666 Leanamore**

1. Site Information check list

Authorisation	None - registered on EPA S22 register as S22-02666
Site Name	Leanamore landfill
Address of townland	Leanamore
Address 1	Ballylongford
County	Kerry
LA functional area	Kerry County Council
Location Map	Yes
Easting	104231
Northing	143590
Source of information	KCC Sources
Owner/occupier	Timothy and Marie Kennelly, absolute, Folio 13755F
Waste activity	Disposal
Estimated tonnage of waste	area times assumed depth of 3-4m = 12,000 to 16,000 tonnes
Hazardous waste present or unknown	Unknown
Verificatin method	
Known Impacts	None visible based on walk over survey
Year opened	
Year closed	
Status	
Containment, total/partial/none	Partial (capping)
Containment, base liner	None
Containment, capping	Partial clay capping
LFG management	Passive vents
Leachate collection	None
Vector map reference	

2. Sources of information check list

Local authority sources	Yes
LA records and knowledge	Yes
Section 22 register (existing)	Yes
Waste Plans	Yes (no entry)
Special Waste Plans	
Section 55 notices	
Section 18 notices	
Complaints database (LA, EPA)	
LA permit register	
Toxic and Dangerous waste register	
Waste oils register	
Derelict buildings register	
Planning files	
LA quarries register	
EPA sources	
EPA waste reports (incl NWD report)	Yes
EPA IPPC facilities	
EPA waste licenced faciiltes	
IPPC reports	
EPA applicant files	
Other sources	
An Foras Forbatha reports	Yes
Trade directories	
GSI quarries directory	
Aerial photopgraphy	Yes
Remote sensing	
Aerial survey	
Newspaper advertisment	

Walkover Survey Checklist	***Comment***
Site	Lenamore
What is current landuse	Planted with coppice
What are the neighbouring land uses	Agricultural to west and south, bogland to east and north
What is the size of the site	Approx 4,000m2
What is the topography	Undulating - slight dome shape
Are there potential receptors (if yes - details)	Yes
Houses	approx 400m
Surface water features (if yes distance and direction of flow)	yes - drainage ditches and watecourse
Any wetland or protected area	no
Public water supplies	no
Private wells	no
Services	None visible
Other buildings	No
Other	
Are there any potential sources of contamination (if yes give details)	
Surface waste (if yes what type)	None visible
Surface ponding of leachate	None visible
Leachate seepage	None visible
Landfill gas odours	No - passive vents in aplce - no odour in close vicinity
Are there any outfalls to surface water	None visible

Are there any signs of impact on the environment (if yes take photographic evidence)	None - photos taken
Vegetation die off, bare ground	No
Leachate seepage	No
Odours	No
Litter	No
Gas bubling thrthrough water	No
Signs of settlement, subsidence water logged areas	None
Drainage or hydraulic issues	Site is wet but drains to all sides
Downstream water quality appears poorer than upstream water quality	No
Are there any indications of remedial measures (provide details)	Yes - capping and passive gas vents
Capping	Yes - sub soil capping
Landfill gas collection	Passive vents only
Leachate collection	None
Describe fences and security features (if any)	Good - overgrown from public roadway - difficut to access
Any other relevant information	
Site name and reference;	Leanamore, S22 02666
Date of inspection;	October 25th 2013
Walk over survey by;	Conor Culloo

SPR Linkages - Risk Screening

Table	*Description*	*Score*			*SPR*	*Max*	*Normalised*	*Risk*
1A	Leachate; source/hazard scoring matrix	5.0	SPR 1	1a * (2a + 2b + 2c) *	0	300	0%	LOW
1B	Landfill gas; source/hazard scoring matrix	5.0	SPR 2	1a * (2a + 2b + 2c) *	0	300	0%	LOW
			SPR 3	1a * (2a + 2b) * 3a	15	240	6%	LOW
2A	Leachate migration; pathways (gw vulnerability)	2.0	SPR 4	1a * (2a + 2b) * 3b	0	240	0%	LOW
2B	Leachate migration; pathways (gw flow)	1.0	SPR 5	1a * (2a + 2b) * 3c	45	400	11%	LOW
2C	Leachate migration; pathways (sw pathway)	2.0	SPR 6	1a * (2a + 2b) * 3d	0	560	0%	LOW
2D	Landfill gas; lateral migration	0.0	SPR 7	1a * (2a + 2b) * 3e	0	240	0%	LOW
2E	Landfill gas; upward migration	1.0	SPR 8	1a * 2c * 3e	0	60	0%	LOW
			SPR 9	1a * 2c * 3b	0	60	0%	LOW
3A	Leacahte migration; receptors, human	1.0	SPR 10	1b * 2d * 3f	0	150	0%	LOW
3B	Leacahte migration; receptors, protected areas	0.0	SPR 11	1b * 2e * 3f	3	250	1%	LOW
3C	Leacahte migration; receptors, acquifers	3.0						
3D	Leacahte migration; receptors, puiblic water supply	0.0						
3E	Leacahte migration; receptors, surface water	0.0						
3F	Landfill gas; receptor, human presence	0.5						

Attachment 6.2; Typical Photographs (walk over survey, 2013)

Photot No 1; Typical view in centre

Photo No 2; Passive vent

Photo No 3; View looking SW from front

Photo No 4; View looking NE from front

Photo No 5; Where planted area meets spruce grove

Photo No 6; View from rear of site looking front

Photo No 7; Adjacent to access point looking NE

LEANAMORE

Environmental risk assessment for unregulated waste disposal sites

	SPR linkage score	Maximum linkage score	Normalised score %
SPR1	75	300	25.00
SPR2	0	300	0.00
SPR3	15	240	6.25
SPR4	0	240	0.00
SPR5	45	400	11.25
SPR6	0	560	0.00
SPR7	45	240	18.75
SPR8	30	60	50.00
SPR9	0	60	0.00
SPR10	2.5	150	1.67
SPR11	0	250	0.00

Table no.	Score	Rationale
Table 1a, Leachate hazard	5	Municipal waste <1 ha
Table 1b, Landfill gas hazard	5	Municipal waste <1 ha
Table 2a, Leachate migration, GW vulnerability	2	High Vulnerability
Table 2b, Leachate migration, GW flow regime	1	Locally important aquifer
Table 2c, Leachate migration SW drainage	2	drainage ditches connection to SW body
Table 2d, Landfill gas Lateral migration	1	Peat as per Teagasc maps on GSI website
Table 2e, Landfill gas Vertical Migration	0	No structures present above waste body
Table 3a, Leachate migration Human presence	1	dwelling house approx. 350m away
Table 3b, Leachate migration Protected areas	0	Need confirmation from Duchas
Table 3c, Leachate migration Aquifer category	3	Locally important aquifer as per GSI website
Table 3d, Leachate migration Public water supplies	0	Public water source >1km no karst aquifer
Table 3e, Leachate migration Surface water bodies	3	SW body within 50m of site boundary
Table 3f, Landfill gas Human presence	0.5	Human presence >250m

Conclusion

Medium risk (class B) site as 1 SPR linkage is between 40% - 70%

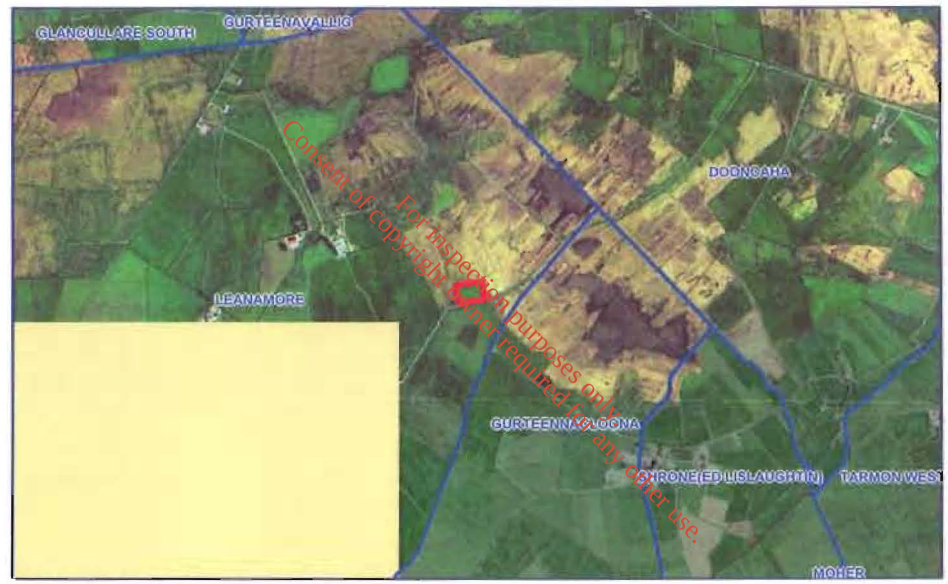
APPENDIX 2: Walkover Survey Checklist

Leamamore 104, 228
143, 573

Walkover Survey Checklist		
Information	Checked	Comment (include distances from site boundary)
1. What is current Land Use?	✓	Deciduous tree plantation
2. What are the neighbouring Land Uses?	✓	Coniferous plantation & turf harvest
3. What is the size of the site?	✓	0.5 Ha
4. What is the topography?	✓	Dome shaped
5. Are there potential receptors (if yes, give details)?	✓	
Houses	✓	No
Surface water features (if yes, distance and direction of flow)	✓	Yes adjacent land drain
Any wetland or protected areas	✓	≈ 1.7km from site
Public Water Supplies		
Private Wells		
Services	✓	No
Other buildings	✓	No
Other	✓	No
6. Are there any potential sources of contamination (if yes, give details)?		No samples taken
Surface waste (if yes, what type?)	✓	None observed
Surface ponding of leachate	✓	
Leachate seepage	✓	
Landfill gas odours	✓	
7. *Are there any outfalls to surface water?* (If yes, are there discharges and what is the nature of the discharge?)	✓	Un known
8. Are there any signs of impact on the environment? (If yes, take photographic evidence)	✓	
Vegetation die off, bare ground	✓	No
Leachate seepages	✓	No
Odours	✓	No
Litter	✓	No
Gas bubbling through water	✓	No
Signs of settlement,	✓	No

subsidence, water logged areas	✓	No
Drainage or hydraulic issues	✓	No
Downstream water quality appears poorer than upstream water quality	✓	No
9. Are there any indications of remedial measures? (Provide details)	✓	Yes, capping & monitoring well
Capping	✓	Yes
Landfill gas collection	✓	No
Leachate collection	✓	No
monitoring well	✓	Yes
10. Describe fences and security features (if any)	✓	limited, 3 strains of wire along some of road frontage as per photos.
Any other relevant information?		

Leanamore



SCALE 1 : 25,000

500 0 500 1,000 1,500

METERS

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Leanamore