



CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE &  
PLANNING

# HISTORIC LANDFILL AT TUAM, CO. GALWAY

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## NON-TECHNICAL SUMMARY

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Prepared for: Galway County Council



Comhairle Chontae na Gaillimhe  
Galway County Council

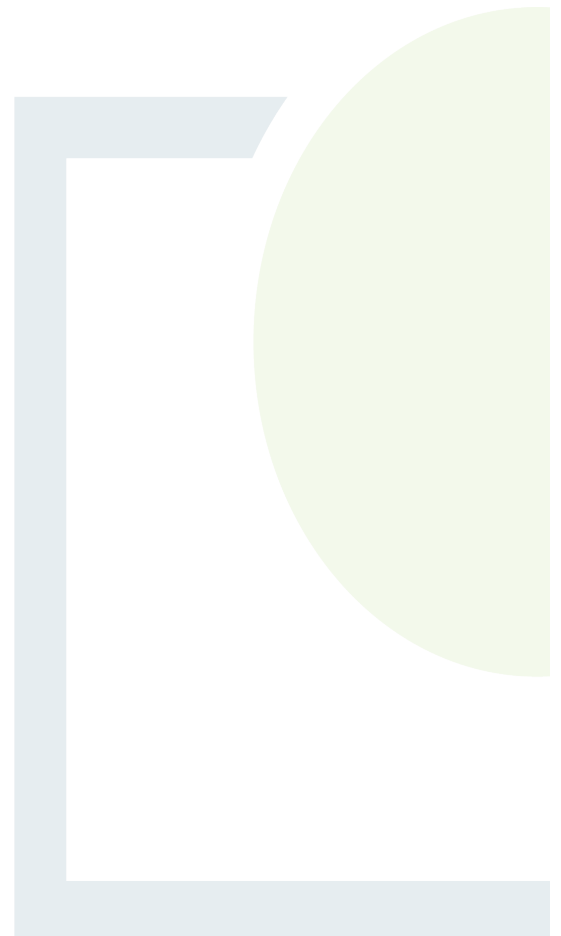
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#### REVISION CONTROL TABLE, CLIENT, KEYWORDS AND ABSTRACT

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**Client:** Galway County Council

**Keywords:** Site Investigation, Environmental Risk Assessment, Waste, Leachate.

**Abstract:** This report presents a non-technical summary of the completed historic landfill risk assessment for the Tuam Historic Landfill, Co. Galway. The non-technical summary has been prepared to accompany the certificate of authorisation application for the site.

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## 1. NON-TECHNICAL SUMMARY

### 1.1 Overview

Fehily Timoney and Company (FT) was appointed by Galway County Council (GCC) to complete a Tier 2 and Tier 3 environmental risk assessment (ERA) and Certificate of Authorisation Application Form (COA) for the Tuam Historic Landfill. The ERA was conducted in accordance with the Environmental Protection Agency (EPA) Code of Practice (CoP) (2007): Environmental Risk Assessment for Unregulated Waste Disposal Sites.

### 1.2 Site Location and History

Tuam historical landfill covers an area of c.3.4 ha and is in the townland of Rinkippen, approximately 2km south of the town of Tuam. It can be accessed via the R347, Athenry Road which runs between Tuam and Athenry. The site is owned by Galway County Council, who operated the landfill until its closure in 1998. An active civic amenity site is located immediately adjacent to the site. The surroundings area is agricultural land and boglands, and no dwellings are located within the site or in its immediate vicinity.

Information provided by GCC states that the landfill operated from the 1950s to 1998 and during this period it is estimated that approx. 11,000 tons of waste was disposed each year. The landfill was subject to remediation works post closure. It is understood that the remediation works were subject to the approval of the EPA at the time. Evidence suggests a geosynthetic clay liner (GCL) capping layer was placed over the landfill in 2001 and subsequently covered with a shallow layer of topsoil. Routine surface water and groundwater monitoring was also carried out by Galway County Council post remediation up to 2013.

A site investigation program was completed as part of the Tier 2 assessment by FT in 2020. The findings of the site investigation work show that material mainly comprising mixed municipal waste is deposited in a single infill area within the extent of the landfill and is estimated to be 23,300 m<sup>2</sup> in area. Based on geophysical survey profile and applying an estimated average depth waste of 36.3 m AOD an estimated waste volume of 145,407.7 m<sup>3</sup> exists at the site. Applying an assumed waste density of 1.6 t/m<sup>3</sup> equates to 232,652 tonnes of waste present.

### 1.3 Geology, Hydrogeology, Hydrology and Ecology

Geological Survey Ireland (GSI) describe the quaternary sediments at the site as 'Cut over raised peat (Cut)' and 'Till derived from limestones (TLs)'. Drillers' borehole site investigation logs describe the presence of peat, silt, clay. Bedrock geology mapping indicates that the bedrock beneath the site comprises two different formations, undifferentiated Viséan Limestones (CDVIS) and pale grey clean skeletal limestone Burren Formation (CDBURR), the boundary of which transects the site. Bedrock described as 'grey limestone' in the driller's logs, was encountered at 6.4 m BGL (27.95 mAOD) during the installation of borehole GW02.

The underlying bedrock, groundwater aquifer is classified as a 'Regionally Important Aquifer - Karstified (conduit)'. The GSI mapping shows that the groundwater body (GWB) is named Clare-Corrib GWB and is classified as regionally important karstified aquifer dominated by conduit flow. There is no record of wells or private drinking supply wells within the site area.



According to GSI there are no Groundwater Drinking Water Protection Areas within the site boundary. The nearest defined groundwater protection zone is located approximately 4.6km west of the site near Belclare and is associated with the Claretuam Belclare Group Water Scheme.

The GSI Online mapping data set identifies the vulnerability of groundwater to contamination is classified as primarily high (H). The area towards the north-west of the site is classified as moderate (M), before becoming low (L)

The site is located within the Corrib catchment (Hydrometric Area: 30), Clare (Galway)\_SC\_040 sub-catchment and Clare (Galway)\_060 sub-basin. Surface water drains have been constructed around the boundary of the landfill. The northern section of the landfill flows into the River Suileen (EPA Name: Killeelaun). This flows west before turning sharply south and subsequently converges with the River Clare downstream. The southern section of the site flows into a stream (EPA Name: the Clare (Galway)\_060) which is a tributary of the River Clare and converges with the River Clare downstream just north of Corofin. The River Clare flows in a southerly direction past Tuam into Turloughmore then turns west before flowing into Lough Corrib.

The site is not located within any Natural Heritage Area (NHA), proposed NHA (pNHA), Special Area of Conservation (SAC) or Special Protection Area (SPA). The River Clare is part of the Lough Corrib SAC (Site Code: 000297) and is located approximately 2km south-west of the site. Surface water drainage from the landfill flows into the River Clare c. 2km downstream, thereby creating a linkage between the site at the SAC.

No observations and/or evidence of qualifying interests (QI) or species of conservation interest (SCI) of European sites or invasive species were recorded during the survey.

#### 1.4 Risk Assessment and Environmental Impacts

GCC first prepared a Tier 1 risk assessment, which determined that the site was a High (Class A) risk to the receiving environment. Applying the EPA risk assessment tool as per the EPA CoP for Unregulated Waste Disposal Sites, yielded a risk score of 70% for source-pathway-receptor (SPR) linkages SPR10 and SPR11.

The Tier 2 site investigation risk assessment concluded that the risk rating of the site was High (Class A). The highest risk ratings of for the site were linkages SPR10, which refers to lateral migration of landfill gas to human receptors and SPR11, which refers to vertical migration of landfill gas to human receptors.

Based on the results of the updated Tier 3 risk assessment, the site is still classified as a **High Risk Classification (Class A)**. The main risks identified on the site are SPR10 and SPR11, as identified on Tier 2, and SPR 1, 7 and 8, referring to leachate migration to surface water receptors via combined groundwater and surface water pathways, groundwater pathways and surface water pathways, respectively.

Tier 3 assessment further examined and quantified those risks/impacts through generation of computational models allowing a prediction of both the current and future impacts on groundwater quality, and the current and future extent landfill gas being generated by the waste present on site.

This information was used to inform appropriate remedial and mitigation measures to be implemented on site to either eliminate or reduce these risks.



Dispersion modelling and calculations show that on a regional scale the migration of leachate to groundwater is unlikely to impact on the overall quality of the underlying Clare-Corrib GWB, due to the natural containment provided by the underlying peats and clays and the presence of the geocomposite clay layer limiting the percolation of rainwater through the waste body.

Surface water monitoring results do provide evidence of potential low levels of leachate migration to the stream immediately adjacent to the landfill impacting on water quality locally. However, an assimilative capacity assessment and mass balance calculation indicates that the leachate produced at the site discharging via adjacent land drains is unlikely to negatively impact on water quality of the Clare River.

The landfill gas generation model and assessment indicate that landfill gas is likely continuing to be produced at the site at relatively low levels, as per results from monitoring rounds conducted. Although monitoring did not detect methane in offsite wells the continuation of landfill gas generation however presents a potential risk of accumulation of gases in enclosed spaces within the immediately adjacent civic amenity facility.

## **1.5 Proposed Remediation**

The Tier 3 assessment concluded that minor landfill capping works are required to repair the existing cap where erosion, poaching and exposure of the GCL has occurred. Additional soil may be required for repairs and resurfacing of final cap.

To monitor the efficacy of the existing and proposed remediation measures, a detailed environmental monitoring programme is proposed at existing and proposed monitoring locations. Additional groundwater monitoring locations are proposed upgradient of the site. A new combined leachate and landfill gas monitoring location is also proposed at the South-eastern Corner of site (adjacent to Civic Amenity Site). It is recommended that continuous gas monitors be installed onsite due to the presence of buildings and human activity immediately adjacent to the historical landfill and the risk that these buildings may also be underlain by waste. Continuous Emissions Monitors (CEMs) are to be installed within all fully enclosed internal areas within buildings above the site.



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