

This Report has been referred for submission to the Board by the Programme Manager, David Flynn

Signed:  Date: 06/06/2018

	OFFICE OF ENVIRONMENTAL SUSTAINABILITY
INSPECTOR'S REPORT ON AN APPLICATION FOR A CERTIFICATE OF AUTHORISATION FOR A CLOSED LANDFILL	
TO: Each Director	
FROM: Magnus Amajirionwu and Brian Meaney	Environmental Licensing Programme
DATE: 06 June 2018	
RE: Application by Sligo County Council for a Certificate of Authorisation for a closed landfill at Finisklin, County Sligo . Certificate of Authorisation Register Number H0006-01 .	

1. Application details

Type of facility:	Closed landfill as defined in the Regulations ¹
Risk category of closed landfill:	High risk (class A) <ul style="list-style-type: none"> • Reason(s): pollutant linkages: <ul style="list-style-type: none"> ○ Leachate migration to surface water and protected areas, ○ Off-site human receptors from landfill gas migration. The size of the landfill (and as a source of leachate and landfill gas) is a contributing factor to the high-risk classification. Post-assessment, the risk of leachate migration to and via groundwater remains a pollutant linkage of less importance.
Section 22 register number:	S22-02623
Application received:	16/8/2012
AA screening determination:	15/12/2016, published to EPA website NIS was sought and was received on 29/8/2017
Regulation 7(4) notice:	15/12/2016

¹ Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008).

Additional information received:	29/08/2017
Name of Qualified Person:	Claire Clifford, PGeo, Malone O'Regan Credentials provided by Institute of Geologists of Ireland
EPA site inspection:	None required

2. Information on the closed landfill

Location of facility:	<p>The Finisklin landfill is located on reclaimed land adjacent to Sligo town. It is on the southern shore of the Garavogue Estuary and was filled over estuarine mudflats.</p> <p>The site of the closed landfill, as delineated by Sligo County Council, is unused although commercial activities have been carried out in the past. Adjacent areas, also on land reclaimed using waste, are occupied and have been for some time.</p> <p>The Sligo and Environs Development Plan 2010-2016 has the landfill partly zoned for mixed use and partly for open space. The proposal for the latter in the northern part of the site is the development of a public amenity.</p> <p>No mixed use has been proposed or defined. Therefore, for the purposes of the risk assessment, a public amenity use has been envisaged by the Qualified Person.</p>
Boundary of the closed landfill	<p>The applicant, Sligo County Council, delineated the closed landfill according to the Council's interpretation of "closed landfill" which is taken by the Council to mean the area filled between 1977 and 1997. I believe this approach is incorrect.</p> <p>The applicant's legal advisor attempted to establish the temporal boundary and established some useful historical facts in the process. The landfill was started by the Sligo Harbour Commissioners in and around 1958 (although earlier fill activities seem to have taken place) and two leases were granted to the Commissioners for fill activities that seem to have taken place before 1977. Subsequent landfilling activities since that time were undertaken by the Council. The Harbour Commissioners' area of the landfill has been excluded from the area of the "closed landfill", the latter being the area filled after 1977. One reason for excluding the Harbour Commissioners' portion of the landfill is the fact that the Sligo Harbour Commissioners were not a local authority. However, in 2006, "the property, rights and liabilities of Sligo Harbour Commissioners were transferred to Sligo County Council"¹. Therefore, the exclusion of waste deposited by or for or with the consent of Sligo Harbour Commissioners appears incongruous with the transfer of the Commissioners' liabilities to the Council, such liabilities to presumably include the landfill to its full extent.</p> <p>Figure 3 is taken from the application and shows the "extent of fill" in blue and the delineated "closed landfill" in red.</p>

¹ Sligo Champion, 9/8/2006: <http://www.independent.ie/regionals/sligochampion/news/port-played-a-key-role-in-the-development-of-sligo-27528051.html>

	<p>The key issue in the areas outside the Council's delineation of the "closed landfill" is the migration of landfill gas. Therefore, regardless of the temporal boundary that the Council wish to place around the "closed landfill", the monitoring that could and should be carried out in neighbouring and adjacent areas is fully included in the recommended certificate of authorisation. In fact, as part of the risk assessment supporting this application, the Council had comprehensively in 2009 and 2010 surveyed the neighbouring and adjacent properties to establish the extent of and risk from landfill gas migration.</p> <p>Condition 3.14 of the recommended certificate of authorisation provides for a communications programme to be put in place by the Council and directed at the occupiers of buildings and land that lies on top of or is adjacent to deposited waste in and around the landfill. The communications programme will inform these people of what they should be doing on an ongoing basis to protect their property and health and the health of employees, neighbours and members of the public.</p> <p>I do not recommend the delineation of the closed landfill put forward by the Council. I recommend a definition that cover the entire extent of waste deposits at Finisklin.</p> <p>The proposed conditions of the recommended certificate of authorisation provide the same level of protection regardless of the boundary of the "closed landfill".</p>
<p>Period of landfilling:</p>	<p>1958 – 1994</p>
<p>Surrounding area:</p>	<p>The landfill is bordered to the north by Sligo Harbour. It is separated from the harbour water by a rock bund built to contain the landfilling activity. The rock bund is porous and was designed to allow the free flow of the tide into the waste and dispersal of landfill leachate.</p> <p>The landfill is bordered to the east and northeast by commercial and industrial facilities on the Deepwater Berth Road. These facilities are built entirely or partly on waste deposits, albeit in the oldest parts of the landfill.</p> <p>The Sligo urban wastewater treatment plant is also located to the northeast on reclaimed land adjacent to the landfill. Site investigations did not show waste deposits in this area.</p> <p>To the south are more commercial and industrial units some of which are built on waste deposits.</p> <p>To the west is the Finisklin Road and occupied residential properties within 50m of the landfill.</p>
<p>Area of the closed landfill:</p>	<p>13 hectares is marked as the "closed landfill" for the purposes of the application.</p> <p>The total area historically used as a landfill is closer to 24 hectares.</p>
<p>Quantity of waste at the facility:</p>	<p>650,000 tonnes estimated, plus 250,000 tonnes imported for capping.</p> <p>In 1991, it was estimated that 10,700 tonnes of domestic waste were deposited annually plus some 2,000 tonnes of commercial and industrial waste. This reportedly increased to 15,000-17,000 tonnes per annum up to closure in 1994.</p> <p>Large quantities of construction and demolition waste were also deposited.</p>

<p>Characterisation of waste deposited:</p>	<p>Domestic, commercial and construction and demolition waste.</p> <p>Since closure in 1994, soil and stone has been imported for capping. Waste permits were granted to private contractors to carry out the works.</p> <p>Site investigations turned up construction and demolition waste, domestic waste, commercial waste and industrial waste including ash, tyres and oil containers.</p> <p>Areas of made ground outside the delineated "closed landfill" contain less waste and more soil, silt and gravel. Waste in these areas was characterised by plastic, timber, fabric, brick, metal and glass.</p>
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3. Site investigations

<p>Current condition and appearance of closed landfill:</p>	<p>The surface of the landfill is generally flat at approximately 6 metres above ordnance datum.</p> <p>According to the risk assessment (2017), waste was deposited to a depth of 1.9m to 4.5m, including the capping layer.</p> <p>A large rock bund was constructed between the landfill and Sligo Harbour to function as the outermost boundary of the landfill. At low tide, leachate seeps and outflows can be seen.</p> <p>The older parts of the landfill to the east and south have been built upon. The newer "southern", "middle" and "northern" parts of the landfill are undeveloped and unused at present although this has not always been the case. It is noted from the application that parts were leased out for end-of-life vehicle recycling and fuel importation operations in (or up to) 2011.</p> <p>The thickness of the cap is reported as being between 0.1m and 3.6m. Capped areas are covered with colonising grasses. Less substantially capped or uncapped areas are overgrown with weeds, shrubs, bushes and trees. There is no evidence of vegetation die-back or odour due to landfill gas.</p> <p>A road was constructed across the landfill to enable access to the site of the recently built municipal waste water treatment plant which is located on reclaimed land at the end of the harbour wall.</p> <p>The undeveloped part of the landfill is generally surrounded by walls or fencing to limit access. The western boundary to the public road has a stone wall and landscaping trees.</p>
<p>Site investigations:</p>	<p>Geophysical survey, 2009: Indicated the presence of construction and demolition waste and organic waste overlying estuarine sands. The thickness of the fill was determined to be 0.6 metres to 10 metres. The highest concentration of construction and demolition waste is in the eastern portion of the landfill. Three concentrated areas of organic material were found in the centre of the landfill. Leachate presence was not determined due to the comparative low resistivity of the estuarine sands. Conductive material or metal was detected across the surface of parts of the landfill.</p> <p>Intrusive site investigations, 2009 and 2010:</p> <ul style="list-style-type: none"> • 23 trial pits to depth 3.4-5.7 metres below ground; • 4 boreholes to depth 13.0-14.1 metres below ground, later used as groundwater monitoring wells;

	<ul style="list-style-type: none"> • 14 probeholes to depth 1.8-6.2 metres below ground, including 4 on adjacent properties, of which 9 within the facility were converted to combined leachate and gas monitoring wells; • 6 shallow boreholes to depth 3.5-5.0 metres below ground level, all at adjacent properties, later used as gas monitoring wells. Three of these are located in the landfill but outside of the Council's delineation of the "closed landfill". <p>In addition, four locations were used for surface water samples – two from seeps discharging into Sligo Harbour and two from ponded rainwater on the surface of the landfill.</p> <p>Samples of soil, leachate and surface water were dispatched for analysis.</p> <p>In the updated Risk Assessment Report received in 2017, landfill gas monitoring took place <i>in situ</i> on 29 occasions between June 2009 and September 2013. Buildings on adjacent properties (some built on the landfill or reclaimed land) were surveyed internally for landfill gas on 32 occasions between 2011 and 2013. Gas monitoring was also undertaken over two events in 2017 with the same scope as earlier ones.</p> <p>A waste odour and visual evidence of Iridescence/sheen was encountered in a large number of boreholes, trial pits and probe-holes, including some outside the delineated "closed landfill". The schematic cross sections shown in Appendix K of the risk assessment show waste deposits and made ground outside the delineated "closed landfill".</p>
<p>Monitoring and analysis of samples (water, gas, waste):</p>	<p>For the original risk assessment, monitoring carried out between 2009 and 2013 were as follows:</p> <ul style="list-style-type: none"> • 29 rounds of gas sampling were done at 19 locations. • 32 rounds of internal landfill gas monitoring at nearby properties. • Leachate samples were taken at 6 locations. • Eluate testing was carried out on 5 waste samples. • Surface water was sampled in 4 locations. • Groundwater was sampled in 4 locations. • Soil was sampled in 5 locations. <p>In the updated Risk Assessment Report, supplementary groundwater, surface water, leachate and gas monitoring were conducted during two monitoring events in 2017 as follows:</p> <ul style="list-style-type: none"> • 16 groundwater samples were taken from 4 locations. • 23 leachate samples were taken from 6 locations. • 2 leachate seepage samples from on location. • 6 surface water samples from 2 receiving waters. • 6 surface water samples from 3 onsite surface water ponds. • 2 landfill gas monitoring events at 14 locations. • 2 offsite gas surveys at 4 locations. <p>Two ecological surveys and assessment as part of the Tier 3 risk assessment, in accordance with EPA Code of Practice, were also conducted.</p>
<p>Hydrology:</p>	<p>The landfill is contiguous to Sligo Harbour. The tide washes into and out of the waste. The rate was not calculated by the applicant. Leachate depth was measured at each monitoring well prior to sampling, but was not reported.</p> <p>The Qualified Person observed ponded water on the surface of the landfill.</p> <p>Available water quality data and information for the Garavogue Estuary, Sligo Harbour and Sligo Bay from monitoring and assessment carried out by</p>

	<p>the EPA (2010 - 2012), Irish Water (2016), Water Framework Directive monitoring programme (WFD 2015) and Marine Institute (2011) show that there is no unacceptable impact on the receiving water quality associated with the leachate arising from the landfill site.</p> <p>Shellfish toxicity report (Irish Water, 2016) identified that there were no toxic impacts on assessed aquatic organisms. The transitional water body within which the inner part of the shellfish area is situated as well as the Garavogue River itself that discharges to the shellfish area are both classified as 'good' and considered satisfactory (WFD, 2015).</p> <p>Sligo Harbour is protected as an SAC and SPA. See section 5 below for appropriate assessment of the potential impacts on the conservation objectives of the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand SPA.</p>
<p>Hydrogeology:</p>	<p>The bedrock aquifer beneath the landfill is classified as a Locally Important Aquifer where the aquifer is moderately productive only in local areas. A groundwater vulnerability of high was assigned. Less than 1km from the landfill, the aquifer is characterised as a Regionally Important Aquifer and extremely vulnerable.</p> <p>Groundwater flow direction depends on the direction of flow of the tide. Groundwater levels in the borehole nearest Sligo Harbour fluctuate with the tide. Leachate levels (generally in shallower wells) did not.</p> <p>No wells were identified within a 1km radius of the landfill. All residences in the vicinity are on mains water.</p>
<p>Leachate and water quality:</p>	<p>Leachate results compared against published minimum and maximum observed ranges show that the key leachate parameters BOD, COD, ammonia and MRP (molybdate reactive phosphorous) and metals were either below or within the published ranges.</p> <p>The only exceptions were chloride which is attributed to tidal influences, and mercury. There were also trace levels of petroleum hydrocarbons and compounds identified in the semi-volatile organic compounds analysis.</p> <p>With the absence of a landfill liner or natural confining layer present, leachate will impact on the groundwater body beneath the site. Elevated levels of chloride and ammonia have been observed in groundwater monitoring results. The elevated ammonia level is being attributed to both onsite and offsite activities; and elevated chloride level is ascribed to saline intrusion.</p> <p>Leachate is also migrating from the site into the adjoining surface waters. However, taking account of the findings of the updated monitoring data and surface water assessment together with the ecological assessment, it is considered that there is no significant impact on the receiving water quality and aquatic habitats adjoining the site.</p> <p>Accordingly, any potential impacts on the receiving environment associated with leachate are considered not significant, and are expected to continue to decline over time.</p>
<p>Landfill gas:</p>	<p>The ongoing generation of landfill gas at the landfill and the close proximity of buildings and underground structures means there are conduits for gas to migrate and accumulate in a manner that potentially poses a risk to property and people.</p>

	<p>There is risk posed by the presence of methane from the site. Recorded concentration of methane of 8%, 24%, 53% and 68% v/v above the upper explosive limit of 5% v/v were recorded at four onsite locations in 2017. These locations include northern and southern parts of the landfill. One was recorded beyond the southern boundary.</p> <p>The results of the internal landfill gas surveys confirm that gas has been migrating offsite and entering properties via service ducts and drains where the highest levels were recorded within properties adjoining the northeast of the site. It is however confirmed by the quantitative risk assessment that there is no immediate risk to any of the offsite properties.</p> <p>Landfill gas generation and migration is the focus of the risk assessment and proposed remedial actions submitted by Sligo County Council. The remedial measures proposed include the installation of a passive gas venting curtain. However, in view of the recorded high concentration levels of methane in some locations of the landfill (including those beyond the Council's delineation of the "closed landfill"), Condition 3 of the recommended Certificate of Authorisation requires Sligo County Council to carry out 24-hour pumping trials to further assess the quantity and composition of the landfill gas, to ascertain whether high methane concentrations are sustainable and, if they are, to determine how it is to be managed using a flare or other techniques. We have consulted with the Office of Environmental Enforcement on the gas monitoring results and were advised on gas flaring and other options.</p>
<p>Conceptual site model:</p>	<p>The conceptual site model developed in 2012 and provided with the original application identified the following pollutant linkages:</p> <ul style="list-style-type: none"> • human health exposure and emission into buildings due to off-site migration of landfill gas; • migration of leachate into the adjoining surface water body; and • migration of leachate into the underlying aquifer and discharge to the adjoining surface water body. <p>Of the three, only the risk posed by gas was taken forward in 2012 for further consideration. The pollution risk to the groundwater and surface water was not borne out from sampling and analysis and assessment or results.</p> <p>The applicant was requested in 2016 to complete the Tier 3 assessment of the landfill in accordance with the Code of Practice. The conceptual site model developed in 2017 was accordingly refined by the Qualified Person and the only remaining pollutant linkage that warrants remedial action is:</p> <ul style="list-style-type: none"> • human health exposure pathway of off-site migration of landfill gas and emission into off-site building (SPR10). <p>The conceptual site model is shown in Figure 6. The source, pathways and receptors can be described as follows:</p> <p>Source:</p> <ul style="list-style-type: none"> - Rainfall on the landfill will preferentially percolate through the cap and into the waste. - Leachate is generated in the waste albeit at low strength. - Gas is generated at the landfill, primarily localised in the area of hydrocarbon disposal. <p>Pathway:</p> <ul style="list-style-type: none"> - Leachate migration from the site through the porous rock bund constructed with a seaward 30m width opening / entrance.

	<ul style="list-style-type: none"> - Leachate can migrate through the base of the landfill into estuarian silts and clay, and underlying aquifer beneath and discharge to the adjoining surface water body. - Seeps of leachate discharge into adjoining surface water body. - Gas migration can occur through the permeable cap and into silts, clays and fractured bedrock beneath the waste. - Gas migration beyond the site boundary through service ducts and drains. <p>Receptors:</p> <ul style="list-style-type: none"> - Existing houses, industrial buildings and other buildings, and users in close proximity of the site. - The bedrock aquifer has been impacted by saline intrusion from the sea and therefore, has low potential for groundwater resources development. - Leachate discharges directly or via groundwater to adjoining water bodies. Both the groundwater body and the surface water seeps clearly show evidence of tidal intrusion.
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4. SPR linkages and remedial actions

<p>SPR linkage scenarios (applicable ones only):</p>	<p>Leachate migration through surface water pathway SPR 8, Receptor = surface water body. SPR 9, Receptor = Surface Water Body Protected Area (SWDTE). Landfill gas migration through lateral and vertical pathway SPR 10, Receptor = Human</p> <p>Summary:</p> <p>Upon the review of the updated monitoring data, surface water assessment and the ecological assessment;</p> <ul style="list-style-type: none"> - the impact of leachate migrating from the site is considered not significant on the receiving water quality and aquatic habitats within the SAC/SPA adjoining the site. - remedial action is warranted to address the risk of offsite migration of landfill gas from the northern portion of the site across the north-eastern boundary.
<p>Proposed remedial actions:</p>	<p>The risk assessment and remedial actions are based on the current use at the closed landfill – i.e. undeveloped except for buildings on the oldest part of the landfill. The western and south-western portion of the landfill has been zoned mixed use. The northern portion (most recently landfilled) is zoned as open space. The proposed remedial actions and the risk assessment completed by the Qualified Person do not take into consideration any mixed-use development that might be proposed in due course. An open space designation has been assumed throughout. The standard certificate of authorisation condition 1.5 will ensure that future developments are not unnecessarily restricted. However, the construction of new structures on a continually gassing landfill will need a revision of the risk assessment should development proposals come forward, for example via applications for planning permission. I therefore recommend inserting a new condition 1.6 to ensure that the construction of any buildings will only take place following consideration by the EPA of:</p> <ul style="list-style-type: none"> • a revised risk assessment, and

	<ul style="list-style-type: none"> • a grant of planning permission for a development that takes into consideration the revised risk assessment, <p>and the grant of a revised certificate of authorisation for the closed landfill.</p> <p>No further capping is proposed in the application and risk assessment, though there is varying thickness of capping across the landfill with some areas having no capping at all.</p> <p>The overall landfill gas remediation strategy includes gas passively venting to the atmosphere via the landfill ground surface. In this regard, a permeable capping thickness of 500 millimetres across the landfill is specified in the recommended certificate of authorisation. No impermeable cap is proposed as a measure in the certificate of authorisation.</p> <p>Some regrading of the existing cap will take place during landscaping. The landscape design for the site takes account of the environmental setting of the site, the proposed landfill gas remediation strategy, and identified ecological constraints such as invasive species (Japanese knotweed).</p> <p>In addition to gas being vented passively through the cap, a virtual curtain system will be installed along 165m of the northeast site boundary and along 85m length of the northwest boundary.</p> <p>It is intended to break the SPR linkages by preventing potential migration of landfill gas to offsite locations and to vent the gas in a controlled manner to the atmosphere.</p> <p>Estimated cost: €600,000.</p> <p>The draft Certificate of Authorisation allows for the importation and use of waste soil and stone to complete the works.</p> <p>Condition 3.14 of the recommended certificate of authorisation provides for a communications programme directed at the occupiers of buildings and land that lies on top of and adjacent to deposited waste. The communications programme will inform these people of what they should be doing to protect their property and health and the health and well-being of employees, neighbours and members of the public from the risk of an incident involving landfill gas.</p>
Proposed aftercare monitoring and assessment:	<p>Monitoring as specified in Condition 3.5 of the recommended certificate of authorisation.</p> <p>Validation report to be submitted within 30 months.</p>
Adequacy of risk assessment:	<p>Regulation 7(7) of the Regulations states that the EPA must be satisfied with the risk assessment before proposing to grant a certificate of authorisation. Notwithstanding the fact that the boundary of the application is smaller than the actual waste deposit, the risk assessment is adequate for the following reasons:</p> <ul style="list-style-type: none"> • It has identified, assessed and adequately addressed the associated risks inherent with the landfill site. • A detailed ecological survey and Appropriate Assessment screening was also completed to evaluate the potential risk to the sensitive habitats associated with the adjoining receiving waters • According to the Code of Practice: Environmental Risk Assessment for Unregulated Waste Disposal Sites (EPA, 2007), municipal waste deposited in landfills before 1977 was relatively low in biodegradable waste. Therefore the areas of very old waste deposits outside the

	Council's delineation of the "closed landfill" will present a relatively low risk of ongoing gas generation.
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5. Appropriate assessment

The licensee submitted a Natura Impact Statement (NIS) as part of this application for certificate of authorisation. This NIS also considered cumulative effects.

A screening for Appropriate Assessment was undertaken to assess, in view of best scientific knowledge and the conservation objectives of the site, if the proposed activity, individually or in combination with other plans or projects is likely to have a significant effect on any European Site. In this context, particular attention was paid to the European Sites at Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627], Cummeen Strand SPA [004035], Ballysadare Bay SAC [000622], Ballysadare Bay SPA [004129], Drumcliff Bay SPA [004013], Aughris Head SPA [004133], Ballintemple and Ballygilgan SPA [004234] and Ardboline Island and Horse Island SPA [004135].

The activity is not directly connected with or necessary to the management of any European Site and the Agency considered, for the reasons set out below, that it cannot be excluded, on the basis of objective information, that the activity, individually or in combination with other plans or projects, will have a significant effect on any European Site and accordingly determined that an Appropriate Assessment of the activity was required, and for this reason determined to require the applicant to submit a Natura Impact Statement.

The reasons for this determination are as follows:

- The closed landfill is adjacent to Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and Cummeen Strand SPA.
- The applicant presented evidence of landfill leachate seeping into the adjacent SAC and SPA.
- The applicant's conclusion that there is no impact on surface water quality is based on one round of surface water sampling in two locations in Sligo Harbour. This appears to be inadequate database of sampling data.

An Inspector's Appropriate Assessment has been completed and has determined, based on best scientific knowledge in the field and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, pursuant to Article 6(3) of the Habitats Directive, that the activity, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site, in particular Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627], Cummeen Strand SPA [004035], Ballysadare Bay SAC [000622], Ballysadare Bay SPA [004129], Drumcliff Bay SPA [004013], Aughris Head SPA [004133], Ballintemple and Ballygilgan SPA [004234] and Ardboline Island and Horse Island SPA [004135], having regard to their conservation objectives and will not affect the preservation of these sites at favourable conservation status if carried out in accordance with the application, risk assessment and recommended certificate of authorisation and the conditions attached hereto for the following reasons:

- A construction environmental management programme (CEMP) incorporating method statements will be implemented for the site works taking cognisance of key guidance including 'Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors' (CIRIA, 2001).
- Specifically, the construction works will be undertaken to avoid the potential for water pollution and will ensure that there will be no significant impact on Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627], Cummeen Strand SPA [004035], Ballysadare Bay SAC [000622], Ballysadare Bay SPA [004129], Drumcliff Bay SPA [004013], Aughris Head SPA [004133], Ballintemple and Ballygilgan SPA [004234] and Ardboline Island and Horse Island SPA [004135].
- the project, alone or in-combination with other projects, will not adversely affect the integrity, and conservation status of any of the qualifying interests of the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627], Cummeen Strand SPA [004035], Ballysadare Bay SAC [000622], Ballysadare Bay SPA [004129], Drumcliff Bay SPA [004013], Aughris Head SPA

[004133], Ballintemple and Ballygilgan SPA [004234] and Ardboline Island and Horse Island SPA [004135].

- Condition 3.5 requires ongoing environmental assessment and monitoring.

In light of the foregoing reasons no reasonable scientific doubt remains as to the absence of adverse effects on the integrity of those European Sites: Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627], Cummeen Strand SPA [004035], Ballysadare Bay SAC [000622], Ballysadare Bay SPA [004129], Drumcliff Bay SPA [004013], Aughris Head SPA [004133], Ballintemple and Ballygilgan SPA [004234] and Ardboline Island and Horse Island SPA [004135].

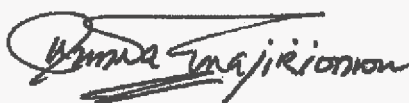
6. Consultation

We consulted with Mr John Gibbons (OEE) on landfill gas assessment and treatment.

7. Recommendation

I recommend granting the certificate of authorisation as proposed.

Signed



Magnus Amajirionwu



Brian Meaney

Procedural Note

Any representations received by the Agency within 30 days of the draft certificate of registration being made available will be considered by the Agency.

As soon as practicable after the expiry of the 30-day period the Agency will determine the certificate of authorisation, which may vary from the draft certificate, and shall issue an appropriately validated certificate of authorisation in accordance with the Waste Management (Certificate of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008.

Figure 1 Location of landfill (yellow boundary) as originally delineated in the section 22 register



Figure 3 The boundary of the closed landfill for the purposes of the application for a certificate of authorisation made by Sligo County Council. Note the blue area was excluded from the scope of the application. Only the "Northern" (1985-1994 later fill), "Middle" (1985-1994 earlier fill) and "Southern" (1977-1985) areas were included in the scope of the application. Areas of fill that took place pre-1977 (in blue) are excluded from the scope of the application.

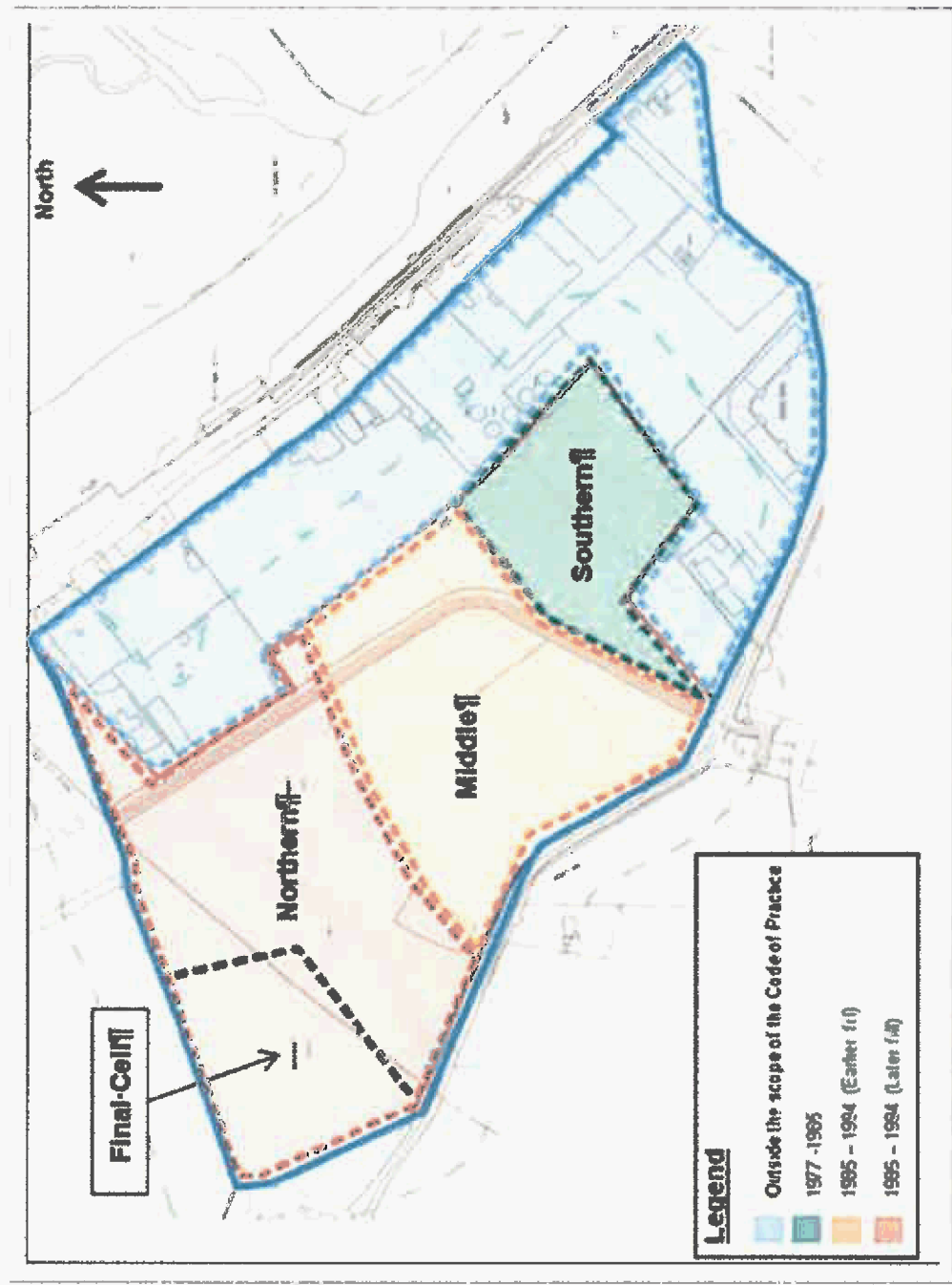
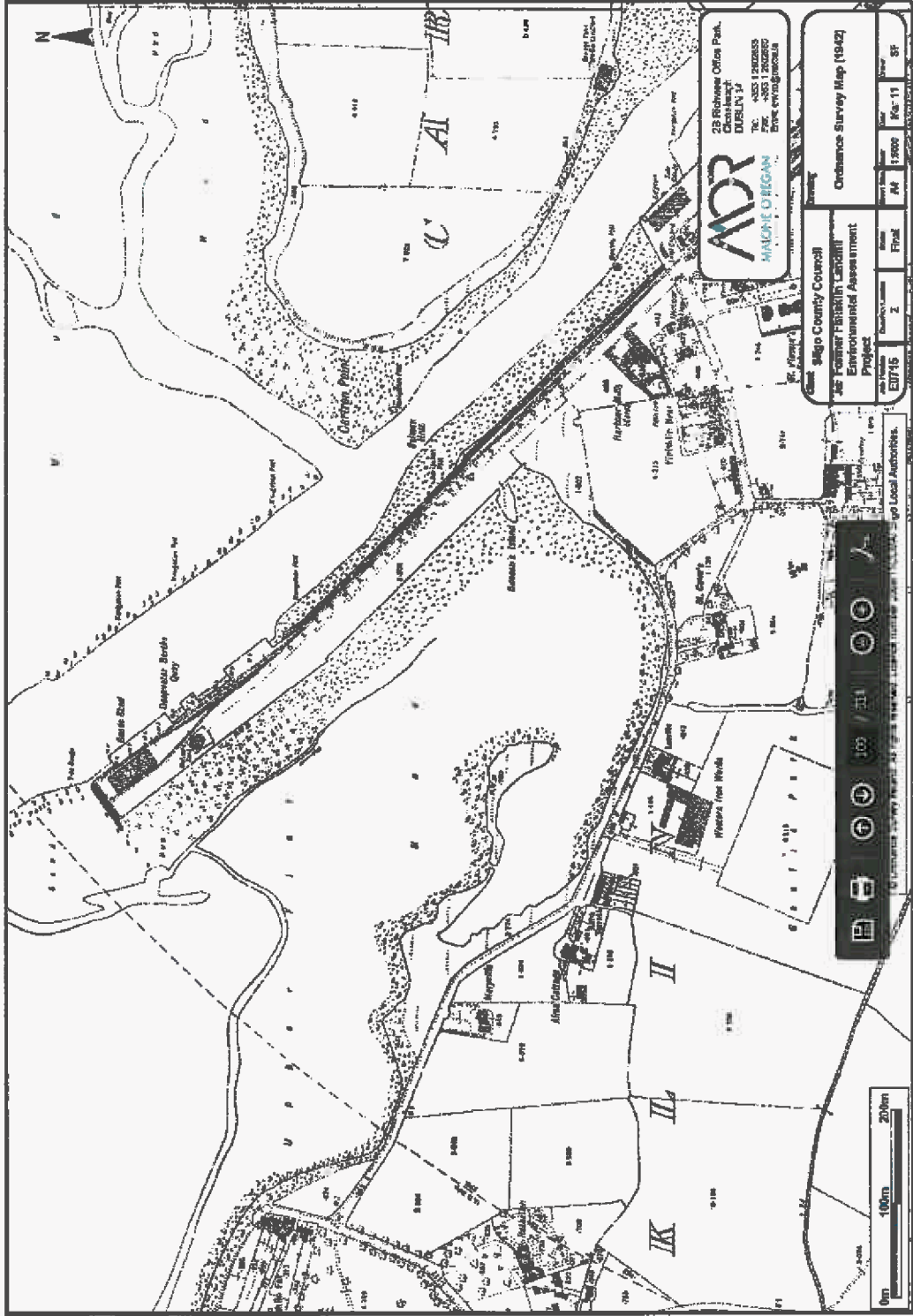


Figure 4 Ordnance survey map 1942 showing the area of the landfill prior to waste deposition



Appendix 2: Assessment of the effects of activity on European sites and proposed mitigation measures.

Site Code	Site Name	Qualifying Interests (* denotes priority habitat)	Conservation Objectives	Assessment
000627	Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	<p>1014 Marsh Snail <i>Vertigo angustior</i></p> <p>1095 Sea Lamprey <i>Petromyzon marinus</i></p> <p>1099 River Lamprey <i>Lampetra fluviatilis</i></p> <p>1130 Estuaries</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1365 Harbour seal <i>Phoca vitulina</i></p> <p>2110 Embryonic shifting dunes</p> <p>2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</p> <p>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)</p> <p>5130 <i>Juniperus communis</i> formations on heaths or calcareous grasslands</p> <p>7220 Petrifying springs with tufa formation (<i>Cratoneurion</i>)</p>	<p>NPWS (2013) Conservation Objectives: Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC 000627, Version 1, National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p><u>Emission to Water</u></p> <p>Any change in water quality has the potential to impact on water dependant habitats and species.</p> <p>The Tier 3 risk assessment carried out in accordance with the EPA Code of Practice show that the presence of leachate at the site and the potential impact on groundwater was minimal and is expected to continue declining overtime.</p> <p>Tier 3 risk assessment of the potential impact associated with leachate migrating via seeps to the adjoining surface waters indicate that it will not have significant impact on the overall water quality of the Garavogue Estuary. Accordingly, there is no unacceptable risk to the adjoining receiving waters of the Garavogue Estuary.</p> <p>The Tier 3 risk assessment also concluded that there is no adverse impact on the sensitive ecological habitats within the adjoining Natura 2000 site associated with the potential pathway of leachate migration offsite.</p> <p>Conclusion:</p> <p>Any potential impacts on the receiving environment associated with leachate are, therefore, are considered as not significant and no remedial action is warranted.</p> <p>Condition 3.5 requires annual monitoring, sampling, analysis and characterisation of leachate. It also requires annual sampling of surface water from the adjacent Sligo harbour; and sampling, analysis and characterisation of groundwater from onsite boreholes.</p> <p>Condition 3.5 requires the certificate of authorisation holder to develop and maintain groundwater and surface water monitoring and leachate, and landfill gas trigger levels.</p> <p>The controls in the recommended certificate of authorisation ensure the qualifying interests of the European sites are protected.</p> <p><u>Emissions to Air</u></p> <p>Landfill gas migration beyond the site boundary is associated with the site. The Tier 3 risk assessment affirms that there is no immediate risk to any of the offsite properties associated</p>
004035	Cummeen Strand SPA	<p>A046 Brent Goose <i>Branta bernicla hrota</i></p> <p>A130 Oystercatcher <i>Haematopus ostralegus</i></p> <p>A162 Redshank <i>Tringa totanus</i></p> <p>A999 Wetlands</p>	<p>NPWS (2013) Conservation Objectives: Cummeen Strand SPA 004035, Version 1, National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>Landfill gas migration beyond the site boundary is associated with the site. The Tier 3 risk assessment affirms that there is no immediate risk to any of the offsite properties associated</p>

Site Code	Site Name	Qualifying Interests (* denotes priority habitat)	Conservation Objectives	Assessment
				<p>with gas arising for the site. As a precautionary mitigation measure, the installation of a passive venting system is recommended for the site.</p> <p>Conclusion:</p> <p>Condition 3.1 requires the installation of a passive gas venting system in the cap and at the perimeter of the closed landfill.</p> <p>Condition 3.6 requires the certificate of authorisation holder to develop and maintain groundwater and surface water monitoring, and leachate and landfill gas trigger levels.</p> <p>The controls in the recommended certificate of authorisation ensure the qualifying interests of the European sites are protected.</p>
000622	Ballysadare Bay SAC	<p>1014 Narrow-mouthed whorl nail <i>Vertigo angustior</i></p> <p>1130 Estuaries</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1365 Harbour seal <i>Phoca vitulina</i></p> <p>2110 Embryonic shifting dunes</p> <p>2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</p> <p>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)</p> <p>2190 Humid dune slacks</p>	<p>NPWS (2013) Conservation Objectives: Ballysadare Bay SAC 000622. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>The NIS did not identify any potential direct or indirect impact on the conservation objectives.</p>
004129	Ballysadare Bay SPA	<p>A046 Brent Goose <i>Branta bernicla hrota</i></p> <p>A141 Grey Plover <i>Pluvialis squatarola</i></p> <p>A149 Dunlin <i>Calidris alpina alpina</i></p>	<p>NPWS (2013) Conservation Objectives: Ballysadare Bay SPA 004129. Version 1. National Parks and Wildlife Service, Department of</p>	

Site Code	Site Name	Qualifying Interests (* denotes priority habitat)	Conservation Objectives	Assessment
		A157 Bar-tailed Godwit <i>Limosa lapponica</i> A162 Redshank <i>Tringa totanus</i> A999 Wetlands	Arts, Heritage and the Gaeltacht.	
004013	Drumcliff Bay SPA	A144 Sanderling <i>Callidris alba</i> A157 Bar-tailed Godwit <i>Limosa lapponica</i> A999 Wetlands	NPWS (2013) Conservation Objectives: Drumcliff Bay SPA 004013, Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	
004133	Aughris Head SPA	A188 Kittiwake <i>Rissa tridactyla</i>	NPWS (2018) Conservation objectives for Aughris Head SPA [004133]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.	
004234	Ballintemple and Ballygilgan SPA	A045 Barnacle Goose <i>Branta leucopsis</i>	NPWS (2018) Conservation objectives for Ballintemple and Ballygilgan SPA [004234]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.	

Site Code	Site Name	Qualifying Interests (* denotes priority habitat)	Conservation Objectives	Assessment
004135	Ardboline Island and Horse Island SPA	A017 Cormorant <i>Phalacrocorax carbo</i> A045 Barnacle Goose <i>Branta leucopsis</i>	NPWS (2018) Conservation objectives for Ardboline Island and Horse Island SPA [004135]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.	

