INSPECTORS REPORT

WASTE LICENCE REGISTER NUMBER 71-1

Marlinstown Landfil, Marlinstown Bog, Mullingar, Co. Westmeath

Recommendation: A waste licence restricting the waste activities to recovery activities be granted with eleven conditions attached.

(1) Introduction:

Marlinstown Landfill has been in operation since 1963 and the wastes disposed of at the facility include municipal, commercial, industrial, sludges, and construction/demolition wastes. It is located approximately 2km from Mullingar, Co. Westmeath, adjacent to the N4 National Primary Road. The facility occupies approximately 9 ha of land in a semi-rural area. The nearest sensitive location is a petrol filling station situated about 100m to the south. Landfilling has taken place at the facility directly onto raised bog, and no infrastructure (e.g. lining) is currently in place for the collection of leachate or landfill gas. The applicant did not propose to install any new lined cells for future landfilling activities, and there is no space for new cells within the site boundary. A location map showing the outline of the facility to which the application relates is provided in Appendix 1. The application for this facility was received on 30/9/98 (prescribed date 1/10/97), hence the facility is an unauthorised one.

The landfill is having a negative impact on the surface and groundwaters of the area. The levels of ammonia recorded upstream and downstream of the site clearly show some deterioration in water quality due to the landfill. Monitoring of the leachate from boreholes within the landfilled waste indicates the presence of elevated levels of List I substances such as diesel range organics, mineral oil and gasoline range organics. Elevated levels of these substances have also been recorded in the groundwater adjacent to the facility and the discharge of these List I substances to groundwater constitutes a breach of Article 41 of the Local Government (Water Pollution) (Amendment) Regulations, 1999 which specify a quality standard of 0 mg/l for hydrocarbons. The discharge into the groundwater is occurring from the base of the unlined landfill, and no technical solution, other than removing the waste, is available to prevent the discharge. On this basis, it is considered that the disposal activities which the applicant applied for would not comply with the requirements of Section 40(4) of the Waste Management Act 1996. The conditions of the proposed decision therefore prohibit the applicant from disposing of waste at the landfill from the date of grant of the licence, and Condition 5.1 of the PD specifies that only inert waste for restoration of the facility shall be accepted at the landfill. The implications of the PD will most likely be that wastes previously accepted at Marlinstown will be disposed of at Ballydonagh Landfill. The applicant plans to install a Civic Waste Facility on-site and this is catered for in the PD. Waste types to be accepted at the proposed Civic Waste Facility are specified in Condition 5.2. The waste activities as set out in the proposed decision will comply with the requirements of Section 40(4) of the Waste

Management Act 1996 but the historic landfilled waste may continue to cause environmental pollution.

There are no leachate or landfill gas management systems in place at the facility, and Conditions 4.13 and 4.14 specify the works and actions to be completed by the applicant in this regard. **These include the installation of a leachate interceptor drain around the waste body, the installation of a lined leachate storage lagoon, and the provision of landfill gas collection and flaring infrastructure.** There is no wheelwash at the facility and because of the limited lifespan of this facility, it is not considered necessary to require the applicant to install a wheelwash. Conditions attached to the PD require the maintenance of current infrastructure such as the weighbridge, septic tank and its associated percolation area. The provision of a waste inspection and a waste quarantine area is required under Condition 4.7, and the possible future composting of green waste (which the applicant applied for) is allowed for under Condition 4.18. Potential nuisances are controlled by Condition 6, and Condition 4.15 of the PD specifies the final capping requirements.

The applicant proposes to restore the facility to pasture land of a low amenity sward, with some amount of landscape planting. Condition 8.1 requires the applicant to submit a restoration and aftercare plan to the Agency for agreement and that the finished level of the landfill shall not exceed 115m OD. The restoration of the landfill is required to be completed by the beginning of 2003 under Condition 8.5, which reflects the intention of the applicant that the facility be closed in an orderly fashion by 1/1/2003.

Name of Applicant	Westmeath County Council
Facility Name(s)	Marlinstown Landfill
Facility Address	Marlinstown Bog, Mullingar, Co. Westmeath
Description of Principal Activity	Disposal of waste at landfill
Quantity of waste (tpa)	90,000 tpa
Environmental Impact Statement Required	Yes
Date Application Received	30/9/1998
Number of Submissions Received	Two

SITE VISITS:

DATE	PURPOSE	PERSONNEL	OBSERVATIONS
23/11/98	Site notice check	S. Kennelly	Site notice compliant
10/3/99	Site inspection	S. Kennelly	Inspect site and surrounds

		J. Brogan	
19/7/00	Site inspection	C. Nolan K. Reynolds	Poor covering of waste and nuisances evident
2/8/00	Site notice check and inspection	C. Nolan	Site notice compliant

The classes of waste activities which the PD allows for are detailed below. The applicant did not apply for Classes 6 and 7 of the Third Schedule, or Class 9 of the Fourth Schedule, however these are included in the PD for the reasons set out below. The inclusion of Classes 4, 6, 7 and 13 of the Third Schedule in the proposed decision allow for the development of a leachate management and treatment system. Classes 4 and 13 of the Fourth Schedule allow for the restoration of the facility using inert materials while Class 9 of the Fourth Schedule provides for the possible future use of landfill gas as a power/electricity generating source. Classes 2 and 11 of the Fourth Schedule allow for the possible future composting of green waste and the use of this compost as a soil enhancement. Classes 3, 4 and 13 of the Fourth Schedule provide for the use of the Civic Waste Facility.

(2) Waste Types and Quantities

Total quantities and types of wastes accepted by the facility for the period 1996 to 1998 are shown below.

YEAR	NON-HAZARDOUS WASTE (tpa)	HAZARDOUS WASTE (tpa)	TOTAL ANNUAL QUANTITY OF WASTE (tpa)
1996	18,000	0	18,000
1997	18,500	0	18,500
1998	19,000	0	19,000

The total quantities of waste "already deposited" at the facility (as specified in the application) are shown below.

	NON-HAZARDOUS WASTE (tonnes)	HAZARDOUS WASTE (tonnes)	TOTALS (tonnes)
"Already deposited" *Note 1	376,500	0	376,500

***Note 1 – Figures as per application, 30th September 1998.**

The licence application submitted in 1998 stated that the remaining capacity of the facility was 85,000 tonnes. It is estimated that to date, a further 43,000 tonnes of waste has been deposited at the facility. Having regard to Condition 5.1 of the PD which restricts the waste types to be accepted at the facility, the amount of inert waste required for restoration would be in the order of 180,000 tonnes. The restoration of the facility is to be completed by 2003 (Condition 8.5), which implies that the annual

intake of waste for restoration will be 90,000tpa and this is specified in Condition 5.1.2.

(3) Emissions to Air

Emissions to air from the facility include landfill gas, odour, dust and noise. Landfill gas has been detected from boreholes at the perimeter of the facility, and also from boreholes approximately 100m to the north of the facility. There is also **evidence of landfill gas migration to the south of the facility in the direction of the petrol filling station**. This poses a hazard to the underground fuel storage tanks here. Landfill gas migration off-site will be controlled following the installation of an active gas collection and flaring system which is required under Condition 4 of the Proposed Decision (PD). Dust and landfill gas monitoring requirements are set out in Schedule E of the PD. Noise emission monitoring results indicate that local road traffic is the primary source of noise in the area. The PD requires the applicant to comply with noise limits of 55dB(A) L_{Aeq} (daytime) and 45dB(A) L_{Aeq} (night-time) in addition to carrying out a noise survey on an annual basis.

(4) Emissions to Groundwater

The bedrock underlying the facility is mainly comprised of basinal limestones of the Lower Calp which have been classified as a locally important aquifer. The Quaternary geology of the area consists of glacial tills overlain by peat. Some sandy gravel deposits underly the peat in the north-eastern portion of the facility. The depth of the overburden is generally >10m in all of the logged monitoring wells, which would indicate a Low to Moderate vulnerability rating for the bedrock aquifer.

The facility is located within the catchment of the River Boyne, although it lies close to the divide with that of the River Brosna. Groundwater flow (i.e. both overburden and bedrock) in the area is generally in a northerly direction, although flow in the overburden directly underneath the site appears to travel outwards in all directions. The presence of hydrocarbons (which are List I substances) was detected in all of the shallow and deep boreholes sampled in the area, with levels of diesel range organics (DROs) in boreholes upgradient of the facility (other than one borehole) in the range of 0.128 mg/l to 0.368 mg/l, and these were accepted as background levels. The presence of the N4 National Primary Road and underground fuel storage tanks at a nearby petrol filling station may increase the risk of groundwater contamination with these substances, however elevated levels of hydrocarbons were not detected at the two boreholes sampled at the Service Station.

Monitoring of the leachate indicates that a mound of leachate exists within the landfilled waste. Analysis of the leachate from the site generally indicated typical compositions of methanogenic leachate. Analyses carried out from one leachate borehole (in November 1999) also showed the presence of List I substances such as Xylene (0.037 mg/l), diesel range organics (12 mg/l), mineral oil (0.63 mg/l) and

gasoline range organics (0.43 mg/l). The presence of high levels of DROs at this location may be exacerbated by diesel coming from a leaking fuel tank which was observed near the centre of the facility on a recent site visit.

There is evidence of both lateral and vertical movement of leachate from the facility, and the contamination plume extends in a north-easterly direction, as evident from two of the deep boreholes in this area. Some shallow groundwater boreholes at the perimeter of the facility exhibited elevated levels for parameters such as Conductivity, Ammonia, Chloride, Sodium, Potassium and Iron. Leachate contamination of the bedrock aquifer is evident at one of the deep boreholes on the site perimeter, which in November 1999 showed elevated levels of Conductivity (1325 μS/cm), Nitrate (54 mg/l), Nitrite (1.1 mg/l), Ammonia (52 mg/l) and Potassium (55 mg/l). **The shallow borehole no. 8, which is located near the boundary of the facility, is not drilled within the waste body but yet shows the presence of List I substances. Elevated levels of diesel range organics (7.42 mg/l) were recorded here in November 1999.**

Based on the evidence of leachate contamination of groundwater as detailed above, it is likely that hydrocarbon List I substances present within the leachate are also entering the bedrock aquifer. Elevated levels of diesel range organics (2.31 mg/l) and mineral oil (0.23 mg/l) were detected in deep borehole no. 27 which is located downgradient of the facility approximately 400m to the north, although elevated hydrocarbon levels were not evident at two deep boreholes (i.e. 15 and 17) which are located between the landfill and borehole no. 27.

The applicant states that potable water supply to all private houses within 1km of the facility is from public mains water supply and according to County Council records, there are no water wells in use in the area downgradient of the landfill. It is believed that the nearby petrol filling station operates a well for the abstraction of water approximately 300m to the south of the facility. The PD includes a requirement for the applicant to carry out regular monitoring of groundwater (Condition 9).

(5) Emissions to Surface Waters

The facility is bounded to the east and south with surface water drains. A small stream, the Marlinstown Stream, flows into the drain which borders the south of the facility and then passes through the site. The Marlinstown Stream eventually flows into the Riverstown River, which in turn flows into the River Deel which is a tributary of the River Boyne. The main channel of the River Boyne is a designated Salmonid Water under the European Communities (Quality of Salmonid Water) Regulations, 1988.

The applicant has provided monitoring data from five surface water sampling points, two upstream and three downstream. Water analysis carried out on the Marlinstown Stream at SW1 which is upgradient of the facility, has shown that this watercourse is contaminated and exhibits elevated levels for ammonia, BOD, sodium, chloride,

potassium and iron. The other upgradient sampling point (SW2) has exhibited much better water quality. Samples taken from the downstream monitoring points nearest the landfill (SW5 and SW3) have shown poor water quality similar to that of SW1. The poor quality of the Marlinstown Stream upstream of the facility has masked the effects of contamination from the landfill to some extent, however **the levels of ammonia recorded downstream of the site clearly show some deterioration in water quality due to the landfill.** Over four sampling occasions, the level of ammonia at SW1 (upstream) ranged from 0.09 mg/l to 4.4 mg/l, while the level of ammonia at SW5 (immediately downstream) ranged from 0.35 mg/l to 12 mg/l. Condition 4.16 of the PD provides for the control of run-off from the facility, and monitoring of surface waters is required under Condition 9.

(6) Other Significant Environmental Impacts of the Development

A number of trees situated on Coillte property to the north of the facility have died, possibly because of leachate and landfill gas emissions from the facility. Future emissions of leachate and landfill gas will be controlled following the installation of leachate/landfill gas collection infrastructure under Condition 4 of the PD.

(7) Waste Management, Air Quality and Water Quality Management Plans

A Draft Water Quality Management Plan exists for the River Boyne catchement. It specifies standards for surface waters in the Riverstown River and the activities recommended for licensing in the PD will ensure that no significant environmental pollution occurs. Consideration was given to the Draft Waste Management Plan for the Midlands Region which states that the facility is due to close by 1st January 2003.

(8) Submissions/Complaints

Two submissions were received in relation to this application.

Submission No. 1: Patrick Mc Carthy (received 13/9/00)
Ground 1. *General complaint regarding the operation of the facility.*
Response:
The Conditions attached to the PD will ensure that emissions and nuisances are controlled, and that the facility will be restored within a specified timeframe.

Submission No. 2: Alan Mc Gurdy, Eastern Regional Fisheries Board (received 18/10/99)
Ground 2. *The surface and ground waters leading from the facility are in the catchment of the Riverstown River which is an important salmonid nursery. All downstream samples show unacceptable levels of pollution, particularly elevated levels of nitrate, nitrate ammonium and BOD.*
Response:

Conditions 4.13 and 4.16 set out leachate management and surface water management plans respectively. The implementation of these plans shall ensure that the quality of surface water and groundwater downstream of the facility will improve, and that the waste activities carried out at the facility shall comply with the requirements of Section 40(4) of the Waste Management Act 1996. Condition 9 and Schedule E require that a programme of surface water and groundwater monitoring be implemented and maintained.

Signed: _____ **Dated:**

Name: Caoimhín Nolan
Inspector, Environmental Management and Planning

APPENDIX 1

LOCATION MAP
(Figure 2.B.1)