



OFFICE OF LICENSING & GUIDANCE

INSPECTORS REPORT ON A LICENCE APPLICATION

To:	DIRECTORS	
From:	DR J DERHAM	- LICENSING UNIT
Date:	10 DECEMBER 2004	
RE:	APPLICATION FOR A LICENCE FROM GREENSTAR HOLDINGS LTD, LICENCE REGISTER 153-1	

Application Details

Type of facility: Class(es) of Activity (P = principal activity): Quantity of waste managed per annum: Classes of Waste: Location of facility: Licence application received: Third Party submissions: EIS Required: Article 14 compliance date: Article 16 Compliance date: Site Inspections:	Non-Hazardous Landfill 3 rd Schedule: 4 th Schedule: 190,000 tpa Non-hazardous household, commercial & industrial wastes. Annaskinnan Residual Landfill, Annaskinnan, Kinnegad, Co. Westmeath. 17/5/01 98 Yes 12/11/02 3/8/04 8/6/01, 26/7/01, 11/9/01, 8/8/03
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Assessment of Application

This report includes observations by Mr Eamonn Merriman (Inspector) who also assessed the application documentation.

1. Facility

Greenstar Holdings Limited (formerly known as Celtic Waste Ltd. and Greenstar Limited) proposed developing an engineered, non-hazardous landfill at Annaskinnan, Kilucan, Co. Westmeath (Figure 1). The proposed landfill has a projected capacity of 1.91 million cubic metres (m³) and a life span of approximately ten years, handling commercial, municipal and industrial waste.

The proposed site is located approximately 3.5Km north of Kinnegad and 3.25km southeast of Kilucan. The proposed landfill footprint would comprise of some 12.75 hectares of the total site area of 36h. The site contains an active sand and gravel quarry (operated by Fergus Carey and Son Ltd.) within a rural setting. The site is bound to the west by residential properties along the Kinnegad-Killucan Road, to the north and south by agricultural land, and to the east by the Cloncrave-Ballyhaw Road with some residential properties on the far-side of that road (Figure 2). The Dublin-Mullingar railway line passes through the southern portion of the site.

There are 23 houses within 500 metres. 12 houses are within approximately 200m of the proposed landfill footprint. The nearest houses being approximately 150 metres from the proposed landfill footprint and c.10m from the applicants property boundary .

2. Operational Description

The applicant applied for the disposal of 175,000 tpa of non-hazardous household, commercial and industrial waste. In addition some 60,000t of inert construction & demolition type wastes will be accepted at the facility over its lifetime for recovery purposes (engineering & landscaping). The waste streams will be pre-treated (off-site) to remove the organic fraction.

It is proposed that waste would be accepted from the Midlands regional waste area (ie. counties Longford, Westmeath, Offaly, Laois and Tipperary N.R.) and from Meath, Kildare, Leitrim and Dublin. The applicant proposed that 20,000 tpa will be delivered by Refuse Collection Vehicles, with the remainder being delivered by Heavy Goods Vehicles. As proposed by the applicant, the facility will not be open to the general public and only waste contractors with pre-arranged contracts with the licensee would be allowed access to the facility. The proposed hours for operation of the facility are 8.00 a.m. to 6.30 p.m. Monday to Friday (excluding bank holidays) and 8.00 a.m. to 2.30 p.m. on Saturdays.

The applicant proposes that initially waste would be deposited into areas of the quarry already worked out, while the remaining areas were being quarried. It was envisaged by the applicant that the overlap between mineral extraction and the landfill operation would comprise of three to five years, depending on market demand for aggregate. Since Fergus Carey and Son Ltd. began quarrying operations, the site has been extensively worked.

Proposed infrastructure included perimeter fencing, access road, office, maintenance building, on-site sewage treatment system (with effluent directed

to a leachate holding tank), screening berms, surface water management/treatment infrastructure, two weighbridges and two wheelwashes (one set to facilitate landfill traffic and one set to facilitate quarry traffic), waste quarantine/inspection area and bunded fuel storage. The applicant also proposed upgrading the facility entrance and adjacent section of county road subject to agreement by the planning authority. The site is not serviced by a foul sewerage system.

Lining System: The applicant proposes constructing a liner consisting of a 2mm HDPE liner over a 500mm layer of Bentonite Enhanced Soil with a permeability co-efficient of 5×10^{-11} m/s. The applicant also stated that the formation level would be 1 m above the highest water table level. Liner design and construction is to be certified by an engineer.

Leachate Management: A leachate collection system is proposed with leachate being tankered off-site to a municipal waste-water treatment plant (WWTP). It is also proposed to re-circulate leachate back into the deposited waste mass once phases had received intermediate capping.

Landfill Gas Management: The active landfilling phase would passively vent to the atmosphere. The applicant proposed retrofitting extraction wells after each phase has received an intermediate cap. Initially these wells will passively vent the gas to atmosphere. Following successful pumping trials, flaring of the collected gas would occur. Upon phased placement of the final cap (2 years after waste deposition stops to allow for settlement), 40m centre permanent extraction wells would be installed. The applicant estimated that the maximum extractable yield of landfill gas would be approximately 534 m³/hr. This rate renders the utilisation of the gas unattractive according to the applicant.

Surface Water Management: It is proposed that surface water run-off will be collected from most hardstanding areas and the northern side of the facility and directed via a sedimentation trap, oil separator and a wetland lagoon to discharge to the North Stream. It is proposed that surface water run-off from the southern side of the facility would be collected via a swale and discharged to the wet grassland area at the southeastern corner of the facility.

Capping: Once waste deposition in a phase was completed, an intermediate cap would be laid to allow for ongoing waste settlement. The final cap would be put in place two years later.

3. Use of Resources

The activity will consume hydrocarbon fuels & electricity associated with the operation of conventional plant and equipment on site. Water consumption will be minimal. The remaining aggregate quarrying will remove available resource such that large-scale resource sterilization due to landfill location, is

avoided. Long-term there will likely be methane recovery (to electricity generation) located on the site.

4. Emissions

4.1 Air

Modelling of emissions from a flare estimated that air quality standards for nitrogen dioxide and hydrogen fluoride would not be breached. An odour model has also indicated that landfilling odours may occur east and west of the landfill. Measures to control odour proposed by the applicant were daily, weekly and temporary covering of deposited waste followed by intermediate capping and the installation of gas extraction wells fitted with carbon filters until such time as active extraction of landfill gas for flaring was established. The applicant stated that these measures “should ensure that odours do not present a significant impact on nearby residents”.

The licence includes conditions controlling the provision, operation, control and monitoring of landfill gas emissions, as well as requiring the control of the working face. The facility will be used for residual wastes (organic fraction substantially removed), this will have the effect of reducing odour potential.

4.2 Storm Water Runoff

The facility is within the catchment of the Riverstown River, a tributary of the River Deel and ultimately the Boyne River. All the above rivers are important salmonid habitats and nursery rivers according to the Eastern Regional Fisheries Board. There are two existing surface water watercourses which are likely to convey run-off/groundwater from the facility towards the Riverstown River: an ephemeral stream arises from a spring which discharges northwards (henceforth North Stream), while the second one flows in an easterly direction from beside a wet grassland area in the southeast corner of the facility (henceforth Southeast Stream). Waterways Ireland contend that drainage from an area west of the landfill contributes via various watercourses to the Royal Canal (the Thomastown supply). While surface water discharges from the proposed facility would not impact that area, it is possible that groundwater passing beneath the site may contribute to it. The applicant states that no surface water moves from the facility - located on a topographical high - in a southerly direction towards the Kilwarden River, which is also a tributary of the River Boyne. However, it is possible that groundwater flow from beneath the site does contribute to that stream.

Surface water quality in the North Stream indicates contamination, possibly by farm animals, and this in conjunction with ephemeral flows, reduced oxygen levels and lack of suitable habitat probably account for low Q values observed in the North Stream.

Water from hard-standing and general run-off will be discharged via treatment to the North Stream. Run-off from the southern service road will be discharged via treatment to a wetland area. These emissions are not

considered to be of environmental significance. The RD sets a number of conditions to control, treat and monitor storm water emissions.

4.4 Emissions to ground/groundwater:

The site lies on an esker (glacial deposited sand and gravel mound). The geology consists of subsoil (interbedded sands, gravels, silts and clays) in hydraulic conductivity with undulating Lucan formation limestone, the top layer of which is weathered. The applicant states that bedrock groundwater flow direction is to the north, and that flow in the gravel layers is influenced by the local topographical elevation and radiates out in all directions to localised surface water discharge points.

The investigations indicate the presence of a low permeability till layer between the sand & gravel horizon and the underlying bedrock. This till cannot be guaranteed to be continuous under the site, but where present will influence groundwater flow by promoting horizontal flow in the sands rather than vertical infiltration into the lower bedrock.

The applicant considers that the areal extent of the sand/gravel deposits is less than 1km² and that it cannot therefore be classified as a Locally Important Sand/Gravel Aquifer. Gravels are normally considered locally important aquifers if they are highly permeable, and have a saturated thickness in excess of 5m over an area of at least 1km². However, having regard to the precautionary principle, the applicants have adopted the Locally Important aquifer classification, and have presented design solutions on this conservative assumption. Thus, and in accordance with the approach outlined in the DoE/EPA/GSI Groundwater Protection Scheme responses for landfills, a landfill groundwater protection response matrix of R3² is identified¹.

This response recommends a 3m layer of low permeability material under the basal liner. This site does not have such a layer and the applicant does not propose one. What they do propose is a significantly superior basal lining system to provide equivalent protection. The Groundwater Protection Scheme and associated responses are not intended as a straight-jacket, rather they are guidelines and a method of risk ranking areas for the purpose of selection of a suitable site and identification of the likely engineering measures necessary to protect groundwater.

¹ The Groundwater protection Scheme and associated Responses set out a method for risk ranking different areas depending on the aquifer resource or groundwater source, and the level of protection afforded by the overburden (vulnerability). Responses for landfills vary R1 to R4 with a number of sub categories. The 'Responses' set out generic guidance on how a certain risk category should be responded to in any assessment. R1 categories are acceptable sites for landfilling subject to normal good practice, while R4 locations are in principle not acceptable (e.g. extreme vulnerability on a regionally important aquifer). The classification of a site (and its associated Response) can be adjusted by engineering in protection which would normally be naturally present.

The Landfill Directive defines BAT for the lining of landfills. It states that a composite liner (Flexible Membrane Liner – FML – must be in direct contact with 1m of clay with a permeability of 1×10^{-9} m/s, or an artificially built mineral layer of equivalent protection. The applicants propose using an FML with 0.5m artificial mineral liner (bentonite enhanced sand or BES) with a permeability of 1×10^{-11} m/s. Despite the 0.5m thickness a mineral layer of this specification will significantly out-perform 3m of low permeability material overlain by 1m of clay with a permeability of 1×10^{-9} m/s.

Ignoring the FML for the moment and considering 1m head of leachate on the two mineral scenarios discussed the calculated leakage (Agency figures) would be:

	1m clay with a permeability of 1×10^{-9} m/s	1m clay with a permeability of 1×10^{-9} m/s overlying 3m of low permeability material (say, conservatively, a clay at 1×10^{-9} m/s)	0.5m BES with a permeability of 1×10^{-11} m/s
Leakage under 1 m of hydraulic head (in $l/m^2/yr$)	63	39	1

$Leakage = k . i . a$

$k = permeability (in m^3.m^2.s), i = hydraulic gradient (head + thickness of liner / thickness of liner, in m), a = area (in m^2)$

What these calculations demonstrate is that the mineral component of the liner proposed by the applicants is nearly 40 times more effective at controlling leakage than that recommended for the mineral component of a basal lining system as detailed in the Landfill Directive and Groundwater Protection Scheme for this category of landfill.

The bedrock was provisionally classed as LI (bedrock which is moderately productive only in local zones) by the GSI. Upon development of the landfill, vulnerability of bedrock groundwater would be extreme leading to a landfill response matrix of R2². The precautionary assumption of a Response of R3² for the gravels is a more conservative Response requirement. Any technical address of the R3² response will therefore address a R2² response.

Quarrying activities do not show notable impact upon groundwater quality. The groundwater has concentrations of manganese and iron which exceed drinking water MAC's on occasion, though this result is not consistent across the surveyed area, including private wells. These elevated concentrations are associated with the local geology. There is evidence of organic (NH₄, nitrite) and faecal contamination of groundwater which is probably derived from residential and/or agricultural activities (for instance elevated ammonium levels were detected which may result from a cattle feeding lot located on an area of

wet grassland located on the eastern side of the facility). Elevated levels of calcium are probably linked to the local geological conditions.

The array of site investigation boreholes generally screen both overburden and bedrock, thus providing short-circuits of intervening till layers. The licence requires the sealing of any groundwater boreholes that are not to be maintained as long-term monitoring points.

The application indicates the presence of 21 wells within 500m of the site, 8 of which are stated as being in use. A cluster of 5 of these active wells, alongside a further 8 inactive wells, are located within 240m of the western boundary of the proposed landfill footprint and are most likely directly linked by sand/gravel deposits to beneath the proposed landfill footprint. The closest private well is c.150m from the proposed landfill footprint. Risk assessment carried out by the applicant in relation to groundwater flow (from the site of the landfill), suggests that 5 wells are within a 100-day travel time (this conservatively assumes a high groundwater velocity) - worst case prediction is that the nearest well is within 50-day travel time.

The applicant used the recognised LandSim modelling software to simulate potential leakage, contaminant travel-times and concentrations, in a variety of scenarios, some of which included for failure of the FML and leachate collection pipework. The results indicate that the leakage calculations for the landfill composite liner solution proposed by the applicant will out-perform the EPA basic standard by a factor varying 10 times (after 30 years) to c.7 times (after 1000 years). The modelling also suggests that concentrations of Ammoniacal Nitrogen and Chloride (two key landfill pollutants) at 150m downgradient of the landfill would not be measurable.

It is possible that the area of the proposed development acts as a groundwater recharge zone. The provision of a hardstanding area and a low permeability final cap with run-off diversion to surface waters may therefore impact on the quantity of groundwater available to local well users. The licence requires the monitoring of local well yields. A local group scheme is already operating in the area.

Notwithstanding the low environmental risk results of the modelled landfill design the applicants are also proposing a 'fail-safe' design addition in respect of the properties to the east of the facility. They propose to include a shallow groundwater interceptor drain running along western margin of the landfill (adjacent to nearest private wells). This drain will discharge via settlement lagoons (and monitoring) to surface water at the north of the facility. The ELV's set for this discharge take account of the background water quality. The RD includes conditions requiring the monitoring of this discharge and the notification of any anomalies suggestive of a leak.

4.6 Wastes Generated:

The site will generate office waste, oil and other similar light vehicle & plant maintenance wastes which will be consigned off-site for disposal. Other wastes such as reject waste loads will be returned to supplier or consigned to appropriate facility.

4.7 Noise:

The noise environment, measured when the quarry was inactive, was typical of a rural environment with ambient noise levels controlled by road traffic, occasional passing trains and agricultural machinery. Noise emissions from the proposed development are likely to arise mainly from the operation of plant, truck movements and the flaring of landfill gas. The applicant estimated that the Agency's daytime noise ELV of 55 dB(A) would be exceeded during initial site development works at the nearest residence located 150m from the landfill footprint. Measures (e.g. throttle back engines when not in use, mobile acoustic barriers, etc.) are to be taken to minimise this impact where possible during construction activities. Thereafter noise levels are predicted to be less than the daytime ELV value.

4.8 Nuisance:

Low background dust deposition rates of 77 and 40 mg/m²/day were recorded when the quarry was inactive. These levels are indicative of the rural setting of the site. Fugitive dust emissions would be likely to arise from landfill development and/or quarrying. Dust control mitigation measures are proposed by the applicant and included in the RD.

The applicant also proposes conventional (BAT) management techniques for other landfill associated nuisances such as litter, vermin, etc. The recommended decision includes various conditions for control litter, dust, vermin and pests.

5. Restoration

The applicant proposes that the facility would be restored to a two-domed landform with final restoration levels post-settlement being between 85 and 99 mAOD Malin. The proposed afteruse for the landfill is agricultural pasture with intersecting hedgerows. The applicant states that the aim of the proposed development is to restore the natural landscape of the area. The planning permission for the quarry granted in 1977 (reference 275/77) required that comprehensive landscaping proposals, designed to eliminate any undue obtrusion by the quarry on the surrounding rural landscape, should be submitted to the Planning Authority for approval.

The applicant proposed the phased construction of a screening berm to an elevation of 83 mAOD Malin to the west and south (north of the railway line) of the landfill. This berm will be planted with trees. Hedgerows would also be planted or augmented along the northern site boundary and east of the landfill.

6. Cultural Heritage, Habitats & Protected Species

The Royal Canal, a proposed Natural Heritage Area, passes approximately 550metres to the north of the proposed landfill footprint. The facility is within the catchment of the Riverstown River, a tributary of the River Deel and ultimately the Boyne River. All the above rivers are important salmonid habitats and nursery rivers according to the Eastern Regional Fisheries Board.

The proposed landfill will be constructed in an area already excavated or proposed for excavation. Ancillary infrastructure will be constructed in areas not subject to quarrying. No protected species of flora were recorded by the applicant. The following protected faunal species were identified on-site: badgers, common pipistrelle (a bat), sand martins (no. of breeding pairs), brown swallows and frogs. Overall there is a large representation of Irish vertebrate fauna on the site. It is also likely that several other protected species such as the Irish hare and other bat species may utilise the site. Habitats of interest on the site were small areas of calcareous grassland located on remaining fringes of the esker (some of which would be lost during the proposed development), an area of wet grassland located at the northwest corner of the site (which will be lost in the provision of an office and other infrastructure) and an area of wet grassland with a portion of wet woodland and fen at the southeast corner of the site (which would not be lost during the proposed development).

The impact of the proposed development ranges from minor to moderate on the vertebrate fauna of the site. Most notable among these impacts would be the loss of sand martin breeding grounds (their removal would require a licence), loss of several badger setts and loss of possible bat roosting sites. The loss of some calcareous grasslands would also occur. Various mitigation measures, including wider internal buffer zones in certain locations, creation of ponds, retention of calcareous grassland (and creation of additional areas during restoration) and retention of the sand martin colony are proposed by the applicant's ecological consultant in additional information to the Agency.

7. Waste Management Plans

The Waste Management Plan for the Midlands Region (2001): From a base of 5 council owned municipal landfills, it was envisaged that three of these landfills would continue in operation to facilitate municipal waste disposal in the short/medium term until a thermal treatment facility plant was established. It was envisaged that the thermal treatment facility would be in place by 2006 and that thereafter only one regional residual landfill would be required for residual municipal waste (residual waste for disposal in 2013 was estimated to be approximately 79,000 tonnes). The plan also envisaged that waste would be exported from parts of Tipperary North Riding to the Limerick/Clare/Kerry waste management region for thermal treatment. According to the plan, 152,000 tonnes was the reported quantity of waste requiring landfill disposal at the relevant local authority landfills in 1998. Waste arisings have increased nationally since then. The plan considered that the private sector could provide major waste facilities. It is recognised that regional/county borders do not restrict the movement of waste.

8. Environmental Impact Statement

The EIS has been examined and assessed and found to comply with the EIA and Waste Licensing Regulations.

9. Compliance with Directives/Regulations

The facility as conditioned complies with the requirements of the Landfill Directive (1999/31/EC). The lining, leachate collection and capping proposals comply with the principles of BAT.

10. Fit & Proper Person Assessment

The application is in accordance with article 12 of the Waste Management (Licensing) Regulations and has been assessed as complying with the Fit and Proper Person requirements.

11. Recommended Decision

In addition to the Conditions of the licence mentioned in the preceding text and the special engineering measures proposed by the applicant (under Emissions to Groundwater above), the Recommended Decision requires a number of design and operational controls specific to this site.

Because the site is on a small hydrogeological mound (gradients away from the site on all sides) the number of perimeter groundwater monitoring boreholes required in the RD is more than would normally be the case.

The application documentation comments that the slope on the base of the liner is to be 1:100 (for the purposes of leachate collection). Leachate head is the single most important factor contributing to leakage potential from a landfill. If you minimise the head, you without question reduce the leakage risk. The gradient in the leachate collection system is a key factor in the efficiency of leachate collection. The EPA Design Manual and best Practice for the sector recommends a gradient of 2% (or 1:50). Conditions 3.11.1 and 6.15.1 of the recommended decision requires this slope and the maintenance of a maximum head of leachate of 1 m at the sump.

As discussed previously there is the potential for visual impact from the development and operation of the site. Current design requires the phasing of the filling to progress west to east. In order to allow time for the establishment of screening and attenuation measures (in particular planting) adjacent to the houses on the west and to the east, Condition 3.5.2 requires the landfill construction to commence with Phase 3 (which is more than 300m from the nearest residence).

Condition 3.25 requires the preparation and implementation of an ecological compensation scheme as articulated in the application documentation.

Condition 12.4 requires the establishment of a community environmental improvement fund.

As noted earlier in this report the local esker likely acts as a recharge area for local wells. A group water scheme is in place. Nevertheless, Condition 6.10.2 requires the monitoring of well yields in local wells (where access provided) and the confirmation of replacement water where yields are negatively impacted by the siting of the landfill.

12. Submissions

There were 98 submission made in relation to this application. An overview of the submissions received is provided. This includes a summary of all issues raised in the submissions. The issues raised, and the response to each issue is set out under the following headings.

12.1 Groundwater

The gravel aquifer is used as a source of domestic supply. It has not been fully demonstrated that the proposed landfill will not cause pollution of groundwaters with injurious consequences for human/animal health and the farming community. Another submission asks how will leaks from the landfill be detected? In engineering terms, because of the risk of pollution, the proposed site is the worst possible location for a landfill of the scale which the applicant proposes [though no evidence was submitted to support this submission]. The application statement that the impacts on the groundwater environment are not considered significant is disputed, [though no supporting evidence was submitted]. The distribution of gravel in the vicinity of the landfill is more extensive than supposed by the applicant. The applicant claims the gravel deposits are bounded by clay but gives no proof for the claim. It would be impossible to stop a leak if one were to occur. No hydrogeological investigations were undertaken outside the proposed site. The applicant failed to confirm the provisional bedrock aquifer classification as provided by the Geological Survey of Ireland. In response to a request for further information, intrusive investigations were carried out to the north and south of the site but not to the west or east, reportedly because of access denial. However, geomorphological evidence as well as submissions prepared by Minerex Environmental Ltd., relating to areas east and west of the site were available to the applicant but were not utilised in the assessment of the areal extent of the sand/gravel deposits. Information supplied by the applicant is contradictory in some cases and hydrogeological data has been inaccurately interpreted.

Inspector's Comment: Refer to Section 4.4 of this report. The applicant has provided a good description of the hydrogeological setting of the site. The sand/gravel aquifer is conservatively assumed to be a Locally Important. There is a risk of contamination to adjacent potable wells due to the short groundwater time of travel between the proposed landfill and nearby potable wells. This is addressed by increasing the standard of the engineered liner, the construction of an interceptor trench for shallow groundwater, and the management of leachate head in the facility. The EIS does report certain constraints in relation to access to nearby lands for the purposed of investigations.

12.2 Impact on the Royal Canal

It has not been fully demonstrated that the proposed landfill will not cause pollution of the Royal Canal, an important public amenity. The proposed landfill is less than 600 metres from the nearest point of the canal. It is noted that the level of a 1.3Km stretch of the canal bed between Thomastown Bridge and Darcy's Bridge is 72.2.mAOD whilst the proposed formation level of the landfill is 78.0 mAOD. It is stated that the

canal just west of Thomastown Bridge is underlain by sand/gravel. There is a distinct possibility that this layer also extends along the canal and underneath the proposed landfill, thus exposing the canal to the risk of contamination. The Thomastown water supply, which is one of the main sources of water for the Royal Canal according to Duchas the Heritage Service (sic), is fed from an area just west of the site and any liner failure could therefore impact negatively upon the water quality of the canal. Where necessary, additional sampling stations should be placed between the canal and the proposed development.

The applicant proposes to collect surface water and discharge it to a stream which is culverted beneath the canal west of Darcy's Bridge. There is concern whether this culvert can cope with the additional flow in periods of prolonged precipitation. The culvert must be studied before any discharge commences with respect to its capacity and condition, and any remedial work should be done following consultation with Waterways Ireland.

Landfilling operations will be visible to users of the canal. Higher screening planting is required at the northern boundary in addition to the applicant's proposal to fill-in hedgerow gaps along the southern boundary of the canal.

The roadway bridges over the Royal Canal at Thomastown and D'Arcy's Bridge may not be able to sustain the repeated heavy loading generated by additional heavy commercial traffic associated with the proposed facility.

Inspectors Comment: Water quality in the canal is unlikely to be directly impacted by groundwater mediated emissions from the landfill as the canal is presumably engineered to contain water. However, groundwater from beneath the site possibly contributes indirectly to the canal via the Thomastown surface water supply, thus providing a potential pathway for leachate to impact water quality in the canal. People boating on the canal would generally have glimpsed views of the proposed landfill though there would be open views from a stretch just east of Thomastown. Traffic volumes and the suitability of the road network is a matter for the planning authority. The carrying capacity of the culvert beneath the canal is to be factored into the design of the stormwater management system for the site. Appropriate flood control measures as well as monitoring facilities are to be designed into the scheme (Condition 3.26).

12.3 Proximity to Residences.

This submission states that the proposed landfill would be located in a residential area, the nearest house being only 64 metres away. The gardens of adjacent residents extend close to the landfill operation. The proposed development does not comply with EU recommendations [not specified] for distances of properties from a landfill.

Inspectors Comment: According to the applicant the proposed landfill footprint would be 150m from the nearest residential house, though it is

considerably closer to the property boundary of that house. There is currently no statutory guidance for 'buffer' zones around landfills. Buffers or 'cordon sanitaires' are intended to provide space or distance between an activity and a receptor for the purpose of mitigating an actual or potential risk to that receptor. And not all receptors are sensitive to the same impact. For example, in a landfill situation where potential impacts might include noise, dust, odour, visual, gas migration, leachate, etc.; a receptor such as a Coillte commercial tree plantation will not be as sensitive to noise as may a local house. An unlined landfill with no gas collection network may require a larger buffer to afford the necessary risk reduction for a local house than may be the case for a modern facility with full containment and collection. So the concept of a buffer will mean different things depending on the circumstance. The distance provided between an identified receptor and a landfill footprint will depend on, inter alia:

- The nature of the waste,
- The design of the landfill (containment, emissions control, etc),
- The landfilling sequence,
- The scale of operations,
- The environmental controls exercised during the operation of the landfill,
- Direction of prevailing wind, groundwater and surface water flow,
- The geology of the area,
- The topography of the area vis-a-vis the elevation of dwellings and the final profile of the landfill,
- The level of screening and landscaping provided,
- The type of receptor,
- Etc.,

The Irish development control documents (Building Regulations 1997 - Part C and the associated DoE Guidance 'Protection of New Buildings and Occupants from Landfill Gas', 1994) speak of a 250m planning control zone around landfills. The Irish guidance notes that the 250m should be considered as a guideline; and in areas with particularly favourable gas migration paths, the gas may migrate further. Importantly the DoE guidance notes that in cases where there are gas control measures (e.g. containment & extraction) little or no gas migration may occur. The DoE documents considered the 250m as a zone around a proposed development site where the developer would check in particular for historical landfilling (i.e. no gas control measures likely), and where a risk needed to be assessed. Indeed, the DoE 1994 guidance stated that no (private) houses should be permitted within 50m of an actively gassing landfill and no private garden within 10m.

Unless in exceptional circumstances (e.g. land remediation project), it would be difficult to technically accept that a mixed waste landfill could operate within 100m of a private residence without causing nuisance (noise, odour, etc).

12.4 Compliance with the Landfill Directive

The applicant has not demonstrated that he will comply fully with European Union law, in particular the requirements of the Landfill Directive (1999/31/EC).

Inspectors Comment: Any licence for a new waste facility requires it to be compliant with the Landfill Directive requirements from the outset.

12.5 Health Impacts

It has not been fully demonstrated that the proposed landfill will not cause injury via emissions to the health of nearby residents. The proposed buffer zone of 150 metres between the landfill footprint and the nearest residence is insufficient to protect the health and welfare of residents. Health and safety concerns are expressed by the applicant to be limited to site operatives, visitors or trespassers but do not include local residents. It has not been fully demonstrated that the proposed landfill will not cause pollution of surface waters with injurious consequences for human/ animal health and the farming community.

Inspectors Comment: Refer also to section 12.3 above. The applicant provided additional information which reviewed the potential impact of the proposed development on human health. In a recently published major study by the UK Government² it was concluded that:

“... we found no consistent evidence that people living close to landfill sites accepting MSW suffered worse health than people living further away from such sites. In particular, we found that the weight of evidence is against any increased incidence of cancers in people living near to landfill sites.”

The Recommended Decision as drafted includes numerous conditions to limit and manage the emissions and operations at the facility such that in accordance with the principles of BAT any risk to human health and the environment is mitigated.

Emissions to the North Stream would follow a treatment train. Emissions to the surface water from the southern half of the facility would be directed to wet grassland via swales and an interceptor, and no impact would be anticipated.

12.6 Surface Water

It is claimed by the applicant that all surface waters drain to the north but it is probable that groundwater also discharges southwards to the Kilwarden River. Groundwater from beneath the proposed site contributes to the Riverstown river to the north of the site. Thus contamination of the groundwater will result in contamination of these river systems. The application statement that the impacts on the surface water environment are not considered significant is disputed.

² Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes. Department for Environment, Food and Rural Affairs, London. 2004.

Currently the North Stream is fed by spring flow. It is proposed to discharge collected run-off via a lagoon to this stream. This proposed change in surface flow regime was not addressed by the application.

Inspectors Comment: It is possible that groundwater emanating from the proposed site, which is located on a topographical high, will contribute to flow in the Kilwarden river to the south of the site. It is also likely that groundwater flow contributes both to the Deel River, a tributary of the Riverstown River and indirectly to the Royal Canal via the Thomastown supply. The ecological importance of the small, ephemeral North Stream is low as indicated by the results of physiochemical and macroinvertebrate sampling. The ecological value of this small stream is likely to remain low unless cattle access to it from adjoining land is restricted and a riparian zone is allowed to develop. The Recommended Decision includes conditions requiring the monitoring, treatment and control of emissions to the North Stream.

12.7 Loss of Amenity

The site of the existing quarry is used for 'sledding' during times of snow, and the development of the landfill will remove this amenity. Walking in the general location will be ruined by the presence of the proposed landfill.

Inspectors Comment: The site is private property, it is not an amenity area. Visual impact is a matter for the Planning Authority.

12.8 Nuisance Due to Birds and Vermin

The applicant did not fully demonstrate that the proposed landfill will not generate an uncontrolled increase in vermin and scavenging birds. The measures proposed for vermin control are insufficient.

Inspectors Comment: Various mitigation measures were provided by the applicant in the application documentation. Proposed Conditions 5.6, 6.21 & 6.22 specifically speak to the control of such nuisance. In addition it is worth noting that the facility is to accept pre-treated waste. The organic fraction (including food waste) will be greatly reduced thereby reducing the attractiveness of the fill for scavenging.

12.9 Conflict with Waste Management Plan

The proposed landfill is in direct conflict with the Draft Midlands Waste Management Plan which contains no provision for a landfill at present and no substantial changes beyond 2006. The Draft Midlands Waste Management Plan provides for an annual regional waste tonnage of 152,000, whereas the proposed landfill aims to accept 175,000 tonnes per annum, thus suggesting a facility for the entire midland region as well as waste importation from outside the region.

Inspectors Comment: Refer to Section 7 of this report.

12.10 Environmental Standards

The application did not fully demonstrate that the proposed landfill fulfils the standards referred to in the relevant air quality plans, water quality plans or hazardous waste plans.

Inspectors Comment: There is no air quality plan for County Westmeath. The applicant did not apply to dispose of hazardous waste. Salmonid standards are already breached in the North Stream due to low oxygen levels. Conditions in the Recommended Decision set limits on emissions to the environments such that there will be no deterioration of existing quality.

12.11 Landfill Gas

There is concern about landfill gas migration from the proposed landfill to nearby residents with the incumbent risks of asphyxiation, methane explosion, fire and poisoning.

The exact type of flaring equipment has not been identified. The application statement that the proposed flare will have little impact on local air quality is disputed, though no supporting evidence was submitted.

The applicant neither discussed the potential for methane to dissolve in groundwater nor proposed monitoring for this parameter.

Inspectors Comment: In view of the proximity of dwellings and the permeable nature of the intervening ground. Landfill gas migration monitoring wells between the landfill and adjacent residences are required in the Recommended Decision. The applicants propose full containment with passive extraction until there are sufficient volumes to sustain active gas extraction. Any flare installed would have to meet the requirements of Best Available Technology. Modelling of nitrogen dioxide from a flare (with stated combustion controls and ELV's) indicated that air quality standards would not be breached.

12.12 Odour

The proposed landfill will cause odour nuisances in its vicinity. The applicant has not demonstrated that local residences or recreational users of the Royal Canal will not be negatively impacted by odours.

Inspectors Comment: The applicant applies to dispose of residual municipal household solid waste, commercial and non-hazardous waste. The commercial and non-hazardous industrial waste will be restricted to non-organic material. It is proposed to only allow residual municipal household solid waste, which has been treated prior to importation to the site. Food wastes and other organic wastes will be removed (as far as is practicable) from the waste stream, as per the recommendations of the Midlands Waste Management Plan. This will reduce the odour potential from the site. An odour modelling report by Bord na Mona Environmental Ltd. (commissioned and submitted by the Kilucan-Kinnegad Environmental Group) indicated that an odour nuisance would be generated at residences to the immediate west and east at various stages of landfilling operations. This assessment did not consider the

acceptance of residual (pre-treated) waste. There are also conditions in the licence (gas extraction, flaring, daily cover, etc) that will help to reduce any odour potential.

12.13 Proximity to Designated Sites

The proposed landfill is close to two designated sites, namely the Royal Canal pNHA and Mount Hevey Bog pNHA/cSAC.

Inspectors Comment: Refer to Section 6 of this report.

12.14 EIS

The Environmental Impact Statement is in many instances grounded on assertions and presumptions as to public health and safety, environmental acceptability and compliance with national and EU law which are unproven and which are causing grave public concern. The applicant is incorrect in the EIS on the subject of local use of wells.

Inspectors Comment: The application (including additional information supplied) indicates the presence of 21 wells within 500m of the site, 8 of which are stated as being in use. A cluster of 5 of these active wells, alongside a further 8 inactive wells, are located within 200m of the western boundary of the proposed landfill footprint and are most likely directly linked by sand/gravel deposits to beneath the proposed landfill footprint. The closest private well is c.150m from the proposed landfill footprint. It is also known that a well provides water for dairy washing north of the site. A group water scheme is available in the area.

I have assessed the EIS and am satisfied that it complies with the requirements of the EIS and Licensing Regulations. The application has satisfactorily addressed any risk to well water via enhanced engineering design. A number of conditions in the Recommended Decision reinforce this risk mitigation via control, treatment and monitoring provisions.

12.15 Liner/Final Cap Installation

The proposed main mitigation measure (ie. basal liner) will not be successful in the long run as experience elsewhere demonstrates [no examples were provided]. The Environmental Impact Statement does not identify the contractors who will lay the liner, their competence or track record. As neither a detailed method statement for the installation of the final cap was specified nor the manufacturer or supplier of the associated liner were identified, it is not possible to assess the proposal.

Inspectors Comment: Landfill liner and final cap specifications are conditioned in waste licences. Additionally they are normally listed in waste licences as Specified Engineering Works. This means that they require the submission of proposals for the Agency's agreement, adequate supervision of installation works and the preparation of Construction Quality Assurance reports.

12.16 Dust

This submission states that the application does not attempt to say what the dust levels will be if the development proceeds. The measures proposed to mitigate dust emissions will be insufficient and there will be a continuing dust problem.

Inspectors Comment: Existing (baseline) dust deposition rates were calculated, and the potential sources of dust emissions were described in the application. Dust control mitigation measures were proposed by the applicant and are conditioned in the licence along with the requirement for dust monitoring adjacent to sensitive receptors.

12.17 Noise

The application does not attempt to say what noise levels will ensue if the development proceeds. As the construction contractor has not been identified, their competence in relation to noise control cannot be determined. The landfill gas flare will generate noise which will be continuous and last for years, but this issue has not been addressed in the application.

Inspectors Comment: Projected noise levels at the nearest residence, both during initial construction and subsequent landfill operation, were estimated by the applicant based the predictions on projected plant to be utilised at the facility but omitted the landfill gas flare from the inventory. It is expected that internal operations during construction will be audible, but will be short-term in nature. During the operational phase internal waste management activities will also be audible. Provided the licensee constructs the noise attenuation measures (including planting) and operates the site correctly, it is not expected that the levels of noise will result in unacceptable nuisance.

12.18 Spillage by Waste Vehicles Utilising the Proposed Landfill

This submission states that no licensing regime appears to be in place to regulate waste collectors/transporters, and without such regulation it is likely that such vehicles will cause pollution by spillages in and around the proposed facility.

Inspectors Comments: Hauliers of waste require a Waste Collection Permit [Waste Management (Collection Permit) Regulations 2001: S.I. No. 402 of 2001]. Waste licences also requires that waste vehicles that deliver waste to a landfill are covered and that debris dropped by vehicles in the vicinity of the facility be removed on a daily basis.

12.19 Wastewater Treatment

The identity of the off-site wastewater treatment plant was not confirmed.

Inspectors Comment: The applicant provided the names of 2 wastewater treatment plants that were prepared to discuss the acceptance of leachate. This is a matter that can be agreed under licence conditions, and in any case prior to the receipt of waste. Condition 5.3 refers.

12.20 Landfill Stability

This submission states that the admission by the applicant that slope failure may be a potential hazard to both human and animal health and to the environment is an understatement.

Inspectors Comment: The existing quarry has steep slopes in places and slope stability would have to be assessed at least annually if a waste facility were to proceed. Condition 6.22 refers.

12.21 Geological Impacts

This submission disputes a statement in the application that there will be little impact on the geological environment [though no supporting evidence was submitted].

Inspectors Comment: The operation of the quarry will continue to remove mineral deposits as regulated by planning permission. An additional area of 1.56 hectares was proposed for quarrying by the applicant.

12.22 Desirability of Landfills

This application for a landfill waste licence runs counter to preferred methods of waste disposal in other European countries where recycling is more advanced. The present proposal will only add to Ireland's over reliance on landfills and its dismal record of waste disposal.

Inspectors Comment: Waste disposal is recognised in the waste hierarchy contained in the European Waste Directive 75/442/EEC. This Inspector's Report only relates to the specific waste licence application at hand. The need for landfill is recognised in the Regional Waste Plan.

12.23 Litter

Prevailing winds may cause litter to enter the Royal Canal. A litter control plan is therefore required.

Inspectors Comment: The canal is downwind of the site in terms of prevailing winds. However, the canal is located over 500 metres from the proposed landfill, and thus the risk of litter blow from the proposed landfill entering the canal is small. The applicant provided mitigation measures to control litter blow.

12.24 Restoration

With regard to the restoration of the landfill, proposed restoration levels in the northern part of the proposed landfill are far higher than the natural ground levels. Therefore the claim that final levels would restore the site to its natural landform are incorrect.

Inspectors Comment: Reference to 1:50,000 scale Ordnance Survey maps indicate that 99 mAOD Malin elevations did historically occur on the site, though it is agreed that the proposed restoration elevations to the north of the site would be higher than currently exist (current elevations range from approximately 80.0 to 85.0 mAOD with proposed elevations in that area of approximately 96.0 mAOD). The proposed elevation would

therefore be 11 to 16 metres higher than the existing natural ground levels in that area, but in keeping with historical levels at the site.

12.25 Site Selection

The site selection process was inadequate. The applicant contends that he undertook a site selection procedure but failed to support this assertion by submitting the detailed findings of the alternative sites. The conclusion is that no proper site selection process was undertaken by the applicant.

Inspectors Comment: The applicant submitted criteria for site selection in further information submitted to the Agency. The applicant contends this process resulted in three sites being examined in order to shortlist one of the sites. The applicant did not identify the two rejected sites but did provide reasons for rejecting them. Otherwise the assessment of alternatives considered mainly the advantages of the proposed site for development as a landfill and the planning requirements to restore it following extraction.

12.26 Site Development

There is a heavy reliance upon the acquisition of pre-sorted and uncontaminated Construction and Demolition (C&D) waste for use on the proposed site, but no guarantee can be given that an adequate supply of such material would be obtainable when required.

Inspectors Comment: A waste licence will regulate waste intake, including C&D waste. The applicant estimated that the site contained an estimated 383,000 tonnes of suitable sand, silt and clay which would be suitable for temporary cover. The applicant estimated that 60,000 tonnes of C&D waste have to be imported to the site for development purposes. National waste production figures for this stream generally show it to be in plentiful supply. In the event that none could be found the applicant would have to source quarry material.

12.27 Ecological Impact

The applicant proposes to remove the wet grassland in the northwest of the proposed site in order to construct an office and ancillary landfill infrastructure. However no assessment was made of the ecological importance of that area. Additional run-off from the proposed landfill when it is finally capped may impact on the wet grassland in the southeast of the site. However this issue was not addressed in the application. Neither an adequate description of habitats on-site nor in the vicinity of the site have been provided by the applicant. The proposed development represents a significant disturbance to vertebrates on-site. By making certain habitat destruction legal, the Wildlife Acts do not cater for ecological protection. The potential for the poisoning of animals which feed on poisoned rats was not addressed by the application.

Inspectors Comment: An assessment of the ecological importance of the northwest wet grassland area was made in an Addendum to the EIS submitted by the applicant. The final cap as proposed by the applicant contains a low permeability layer beneath a surface water collection layer

designed to direct run-off either to the North Stream via a treatment train or via a swale to the wet grassland area in the southeast corner of the site. As proposed by the applicant run-off to the south-east wet grassland area would originate from the southern unpaved access road and parts of the southern buffer zone via swales. Therefore, it would be expected that this run-off would not be contaminated other than in the event of accidental spillage or swale erosion. Thus for normal operation, no adverse impact would be anticipated in that area. Descriptions of habitats on-site were provided by the applicant. The applicant's ecological consultant made various proposals to reduce and mitigate ecological impacts that would arise from the proposed development. If the development were to proceed, these proposals would have to be considered. Such consideration is required by Condition 3.25.

A suitable vermin control programme would be required if this development was to proceed.

13. Charges

The RD requires the payment of €18,250.00 to the Agency in respect of monitoring & enforcement. The RD also requires the establishment of a community environmental improvement fund.

14. Recommendation

All the documentation submitted in relation to this application has been considered. It is recommended that the Agency grant a licence subject to the conditions set out in the attached RD and for the reasons as drafted.

Signed

Dated 10/12/04

Dr J M Derham
Senior Inspector

Procedural Note

In the event that no objections are received to the Recommended Decision on the application, a licence will be granted in accordance with Section 43(1) of the Waste Management Acts 1996-2003.