INSPECTORS REPORT

Waste Licence Register Number: 12-2
Applicant: Cork City Council (formerly Cork Corporation)
Facility: Kinsale Road Landfill
Inspector's Recommendation: That a revised licence be granted subject to conditions.

(1) Introduction

This report relates to an application by Cork City Council for a review of the existing waste licence for Kinsale Road Landfill (Reg. No. 12-1, issued 02/02/00). The review application was received on 28/09/01. The landfill has been in existence since the early 1960's and is unlined. The facility including historically landfilled areas is approximately 72 hectares in size. It is estimated that up to January 2002, 2.4 million tonnes of waste have been landfilled at the facility.

A large amount of infrastructure has been put in place since the existing licence was issued. This includes a leachate collection drain and a leachate treatment plant. Further details are given in Section 3 of this report.

The primary reason for a review is to increase the remaining void space of the landfill by changing the layout of the final waste profile post-settlement, which was set in the existing licence. The applicant proposes to landfill an additional 1-2m over an area of approximately 10 hectares (all previously landfilled). The maximum height (23 mOD) of the waste profile is not increased from that required under WL12-1 although the proposed area at this height is larger. The areas which the applicant proposes to continue to landfill are shown as Phases 1-6 on Drawing No. 2001-011-08-018 Rev. B of application entitled "Filling and Final Capping Sequence" of the application. This would allow for an increase in approximately 91,000 tonnes in void space. The applicant did not propose to line these areas.

I recommend that the additional landfilling be allowed in Phases 1-5. I recommend that no additional landfilling takes place in Phase 6 (further details are provided in Section 12 of this report). This restriction reduces the void space to 80,000 tonnes.

Table 1 below sets out the impacts of various scenarios on the lifespan of Kinsale Road Landfill.

Table 1

Scenarios (Taken from information received from applicant in September 2001)	**Predicted Closure date of Landfill**
No diversion of commercial waste and no increase in final profile granted by Agency	September 2002
Diversion of commercial waste only (currently in operation)	June 2003
Increase in final profile granted (with Phase 6) & diversion of commercial waste.	March 2004
Increase in final profile granted (without Phase 6) & diversion of commercial waste [Note 1]	February 2004

Note 1: The recommended Proposed Decision does not allow landfilling in Phase 6 (see Section 12 of this report).

The principal activity and classes of activity applied for are as licensed under the existing waste licence:

- Waste Disposal Activities – 3rd Schedule (Classes 1, 2, 4, 5, 7, 11,12 and 13); and
- Waste Recovery Activities – 4th Schedule (Classes 2, 3, 4, 10, 11, 12 and 13).

The principal activity applied for is Class 1 of the 3rd Schedule.

The environmental impacts and associated mitigation measures at this facility were addressed in detail in the Inspector's report that accompanied the Proposed Decision for the existing Waste Licence 12-1. The monitoring requirements of the recommended Proposed Decision reflect those of the existing licence and any subsequent agreements during the enforcement of the existing licence.

It is recommended that all the above activities, for which the applicant has applied for be licensed subject to the conditions outlined in the recommended Proposed Decision.

EIS Required	No
Planning Permission status	Granted by Cork County Council
Number of valid submissions received	Two

FACILITY VISITS:

DATE	PURPOSE	PERSONNEL	OBSERVATIONS
05/11/01	Site notice check	Regina Campbell	Note this was the second notice published due to an error in the text of the original notice.
25/01/02	Site inspection	Regina Campbell/Brian Donlon	General enforcement visit.

Appendix 1 contains a 1) Drawing No. 2001-011-08-023 Rev. B of application entitled "Waste Contour Plan (Post Settlement)" and 2) Drawing No. 2001-011-08-018 Rev. B of application entitled "Filling & Final Capping Sequence".

(2) Reasons for the licence review as outlined by the applicant

The applicant stated the following reasons for the licence review:

- **To increase the available capacity of the landfill** – Condition 8.2 of the existing licence (12-1) sets the final waste profile of the facility. The review application proposes a revised contour plan as shown on Drawing No. 2001-011-08-023 Rev. B. This change of profile would increase void space at the facility. Condition 4.2 of the recommended Proposed Decision requires a revised final waste profile to be submitted to the Agency, which incorporates the prohibition on landfilling in Phase 6 (See Section 12 of this report).
- **Alteration of the final cap requirements:** The applicant requested that geosynthetic materials as well as C & D material that has been verified fit for purpose be allowed for use as part of the cap. Condition 4.3 of the recommended Proposed Decision allows this.

- **Prolong life of the C & D Facility:** The applicant requests that the life of the C & D facility is linked to the completion of the final cap at the facility. Condition 5.8 of the recommended Proposed Decision allows this.
- **Amend the boundary of the facility:** The applicant requested that the facility boundary be revised to facilitate a land transfer to a football club and to facilitate road developments. These lands do not have any previously deposited waste. Condition 1.2 of the recommended Proposed Decision allows this.
  The applicant also expressed a wish to lease and sell historically landfilled areas to the west of the South City Link Road. However no further written information was received by the applicant in relation to this matter.
- **To incorporate infrastructure developments:** As requested by the applicant, the recommended Proposed Decision incorporates any infrastructure developments undertaken since the existing licence was granted.
- **Amend monitoring requirements:** As requested by the applicant: 1) the monitoring requirements of the stormwater retention pond and reedbeds has been updated to reflect their revised layout and 2) dissolved methane monitoring in the leachate discharge may now also be carried out using a dissolved methane probe.

(3) Facility Development

The installation and control of all existing and proposed infrastructure at the facility is controlled by Condition 3 of the recommended Proposed Decision.
A large amount of infrastructure has been put in place since the existing licence was granted. This includes a new administration complex, weighbridge, wheelwash, waste inspection and quarantine area, a civic waste facility, a leachate conditioning plant, a composting slab (green waste), leachate cut-off wall, sheet pile wall, leachate collection drain, leachate storage lagoon, stormwater retention pond and reed beds. The majority of this infrastructure is completed. It is estimated that 7million euro have been spent on capital costs alone on upgrading the facility to meet the existing licence (12-1) requirements.

Leachate Management
Existing infrastructure - A leachate cut-off drain, sheet pile wall and leachate collection drain at the facility have been completed in January 2002 to collect leachate generated from the landfill. In their AER, the applicant stated that 79,282 m^3 of leachate was treated at the facility before discharge to sewer in 2001. This leachate would otherwise be discharging to surface water and groundwater if the leachate collection system was not in place. The quantity of leachate collected should increase now that the leachate management infrastructure is fully completed. Leachate generation will also decrease as final capping is undertaken at the facility. The applicant has also voluntarily constructed a temporary cut-off trench and storage lagoon to collect any contaminated stormwater flows due to leachate breakouts during heavy rainfall. This water is being discharged to sewer also.

Additional infrastructure required - Condition 3.12 of the recommended Proposed Decision requires an additional leachate abstraction borehole to be installed in each of Phases 1-5 to collect additional leachate generated by the landfilling.

Cover & Capping System

Condition 4.3 of the recommended Proposed Decision sets the final capping requirements at the facility and Condition 5.5 sets out the daily and intermediate cover requirements.

Landfill Gas Management

Condition 3.13 sets landfill gas management requirements at the facility.

Restoration & Aftercare

Condition 4 requires a revised Restoration and Aftercare Plan to be submitted to the Agency to reflect changes due to the requirements of this recommended Proposed Decision.

Nuisance Control

The nuisance controls for the facility are specified principally by Condition 7 of the recommended Proposed Decision.

(4) Waste Types and Quantities

Condition 1.4 and Schedule A of the recommended Proposed Decision sets the quantities and types of waste allowed to be accepted at the facility for disposal and recovery. Condition 1.5 sets restrictions on waste disposal at the facility.

The existing licence allows 200,000 tonnes per annum to be landfilled. However, only 118,000 tonnes was landfilled in 2001 and 140,000 tonnes in 2000. Cork City Council also state in their application that it is unlikely that the annual input will be any greater than 100,000 tonnes per annum.

A significant amount of recovery also takes place at the facility. In 2001 a total of 261,800 tonnes of C & D waste was recovered at the facility. In addition approximately 820 tonnes of other various waste (e.g. cardboard, metal, plastic, bottles, cans, batteries) and 9,400 litres of waste oils were received for recycling/ recovery at the facility in 2001. A total of 8 million kWh per annum of energy is produced at the landfill gas utilisation plant operated by Irish Power Systems Ltd. This power is fed to the national grid.

At present cement bound asbestos is accepted for landfilling at the facility under strict conditions laid down in the existing waste licence. The recommended Proposed Decision permits the continued landfilling of this material pending the establishment of measures for the disposal of this material under the Landfill Directive (see Condition 5.8). Schedule A limits the quantity of asbestos waste accepted to 500 tonnes per annum. Annual monitoring for asbestos fibres is required under Condition 8.1.

(5) Emissions to Air

Emissions to air from the facility include landfill gas, combustion products of landfill gas, odours, dust, PM_{10} and noise.

Landfill Gas and Combustion Products of Landfill Gas:
Condition 6.1 sets emission limits and Condition 8.1 of the recommended Proposed Decision sets monitoring requirements for landfill gas.
In light of the number of odour complaints received (34 No. in 2000 and 2001) and the proximity of residences to the landfill, it is also recommended that a proposal to monitor surface methane emissions is undertaken annually to assess any escape of landfill gas from either the capped and uncapped areas (Condition 8.5).

Odours
Condition 7.2 of the recommended Proposed Decision requires the licensee to ensure that odours do not give rise to nuisance at the facility or in the immediate area of the facility. Odour monitoring is required under Condition 8.1.

Dust/PM_{10}
Dust and PM_{10} monitoring requirements and emission limit values are set out in Conditions 6.1 and 8.1.

Noise
Noise monitoring is required under Condition 8.1 and emission limit values are set at noise sensitive locations.

(6) Emissions to Groundwater

The Inspector's Report that accompanied the existing waste licence 12-1 outlines the geology and hydrogeology of the facility.
Monitoring locations NW1-NW8 were installed outside of the leachate cut-off drain to check the efficiency of the leachate collection system. Monitoring results for April 2002 indicate that ammonia concentrations in groundwater monitoring boreholes outside the leachate collection drain are elevated. Ammonia ranged from 7mg/l to 40mg/l in boreholes NW3-NW8 with boreholes NW1 and NW2 having ammonia concentrations of 170mg/l.

However, these concentrations are much lower than the average ammonia concentration (425mg/l) found in leachate discharged to sewer during the same period. With the last section of the cut-off wall (adjacent to NW1 and NW2) completed in January 2002, concentrations of leachate indicators in the groundwater monitoring boreholes should show an improvement over time. Final capping will further reduce the amount of leachate being produced. There are no abstractors of groundwater for potable or production purposes downgradient of the facility. Groundwater monitoring is required by Condition 8.1. Condition 6.4 also requires the licensee to submit groundwater trigger levels to the Agency for agreement for three of the newly installed boreholes downgradient of the leachate collection drain.

(7) Emissions to Surface Water

Monitoring in January 2002 indicated that there is an increase in ammonia (1.7mg/l) downstream of the landfill compared to upstream (0.09mg/l) and an increase in BOD downstream (2.2mg/l) compared to upstream (1mg/l). It is likely that once final capping commences, and the stormwater retention ponds and reedbeds are in operation to collect contaminated surface water run-off, that contamination of surface waters should be greatly reduced. Monitoring of surface water and discharges from the stormwater retention facility/reed bed system is required by Condition 8.1.

(8) Emissions to Sewer

The sewer that receives leachate from the facility currently discharges to Douglas Estuary without any treatment. The sewer outfall will eventually be diverted to Carrigrennan WWTP (estimated completion date of 2004). Section 52 consent from the Sanitary Authority (Cork County Council) has been received and the recommended Proposed Decision has been drafted accordingly.

(9) Other Significant Environmental Impacts

None.

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

The Cork City Waste Management Plan (dated September 2001) states that a new landfill site for residual wastes will be constructed to replace the Kinsale Road Landfill when it has reached its full capacity. It also states that the Kinsale road landfill will be developed as an important recreational asset for the city and that its Civic Amenity Site and other recycling activities will be retained. There are no Air Quality and Water Quality Management Plans relevant to this facility.

(11) Submissions

Two submissions were received in relation to this application. These are listed below.

Submission 1 - Kinsale Road Action Dump Group. This was a request for a copy of the application and information on how to object to the application. No further correspondence was received from this party.

Submission 2 - Cllr. Dan Boyle of the Green Party. He requests that the extension of the permitted contour levels not be granted by the Agency. This would prevent Cork City Council from using Kinsale Road as a last resort waste option and force them to examine the issues of waste management.

Response

The recommended Proposed Decision requires the landfill to cease waste acceptance on 1st March 2004. It also restricts the monthly inputs to 10,000 tonnes per month. This is so that void space can be used for waste which Cork City Council is legally obliged to provide for the disposal of.

(12) Reasons for the Recommendation

I recommend that a revised waste licence be granted subject to the conditions in the recommended Proposed Decision. I recommend that the following requirements as a minimum should be satisfied:

- **Prohibit landfilling in Phase 6** - The applicant requested that an area north of the perimeter road (Phase 6) be used as an 'Emergency Backup Filling Area' (shown on Drg. No. 2001-011-08-018 Rev. B of the application) only if all other areas within the site were full and no external alternative sites were available. I recommend that no landfilling be allowed in this area (see Condition 5.7). In recommending this, I have taken into account the following reasons:
    1) its proximity (approximately 160m) to dense residential areas;
    2) previous landfilling in the northern area of the facility at a distance further from residences than Phase 6 generated many complaints due to litter, odour, noise, birds, flies etc;
    3) no landfilling has taken place in this area since the 1980s and the area has been capped and grassed over.
- **Provision of additional leachate abstraction boreholes at the facility** – Condition 3.12 requires a leachate abstraction borehole to be provided in each of Phases 1-5 as an additional leachate collection measure. This measure is in addition to the leachate cut-off wall, collection drain and eight leachate pumping stations that were completed in January 2002. The additional nine months (June 2003 to March 2004) of landfilling in Phases 1-5 will generate an estimated 28,425m^3 (or 105m^3/day) of leachate over the amount of leachate that would be produced if Phases 1-5 were finally capped (see Appendix 2 for calculations). In 2001, 79,282m^3 (or 217 m^3/day) of leachate was discharged to sewer. This leachate would otherwise have been discharged to surface and groundwater in the absence of leachate control measures at the facility. There is scope for an additional 139,718 m^3/annum (or 383 m^3/day) of leachate to be discharged to sewer under their Section 52 consent from the Sanitary Authority.
- **Capping of landfill** – Condition 4.3 requires Areas A and B (to the east and nearest to residences of the landfill) to be finally capped by October 2002 and Area C to be capped by October 2003. All other phases are required to be capped within twelve months of having been filled. Condition 5.5 requires all areas to be covered with intermediate cover except the working face and finally capped areas. All of these measures will reduce leachate generation at the facility.
- **Installation of additional landfill gas control measures** – In their Article 14 response received 8th March 2002, Cork City Council state that environmental considerations are to take priority over the economic considerations currently employed by Irish Power Systems Ltd. (operators of the landfill gas utilisation plant). Odour monitoring undertaken over the last two years, odour modelling submitted as part of the application, complaints received by the applicant (34 No.) and notices of non-compliance issued (3 No.) all indicate that the landfill is having a significant odour impact on the surrounding environment. Therefore, Condition 3.13 of the recommended Proposed Decision requires an enclosed landfill gas flare to be provided at the facility. This is to allow flaring of gas from all landfilled areas

not being directed to the existing utilisation plant and therefore reduce ongoing environmental nuisance due to odour.

- **Place monthly restrictions of amount of waste landfilled** - As part of their application, Cork City Council state that with diversions of commercial waste in place, that approximately 10,000 tonnes of waste per month will be landfilled at Kinsale Road. I recommend that in order to conserve void space for waste streams which Cork City Council is obliged to provide for, that a limit of 100,000 tonnes per annum or 10,000 tonnes per month of waste for landfilling is set (see Schedule A).
- **Limit lifespan of landfill** – This facility is located within 3km of Cork City Centre with dense housing, schools, businesses etc. adjacent to the facility. It is unlined and has generated numerous complaints since the existing licence was issued. A number of non-compliances have also been issued in respect of this facility. Many of these complaints and non-compliances related to poor on-site operational practices and environmental nuisances. In order to prevent further environmental nuisance due to litter, birds, odour and visual impact I recommend that no further waste is accepted at the landfill after 1st March 2004 (see Condition 1.5).

Signed: _____ Dated: _____

Regina Campbell, Inspector 23rd May 2002

Environmental Management and Planning

Appendix 1

Drawing No. 2001-011-08-023 Rev. B of the application entitled "Waste Contour Plan Post Settlement"

Drawing No. 2001-011-08-018 Rev. B of the application entitled "Filling & Final Capping Sequence"

Appendix 2

Estimated leachate production at Phases 1-5 under different scenarios

Provided below are estimates of the leachate volumes likely to be generated at Phases 1-5. The assumptions on which the calculations are based are outlined. All phases referred to are as shown in Drawing No. 2001-022-08-018 Rev. B of the application.

Assumptions:
Estimated total area to be landfilled in proposed development (Phases 1-5) = 98,000m^2
Average area of active phase = 19,600m^2
Average area of temporarily restored phases = 78,400m^2
Average tonnes of waste landfilled in each phase = 16,000 tonnes per annum
Total waste to be landfilled = 80,000 tonnes per annum

Calculations based on the following:

Lo = [AR (A)] – [aW]

Where:
Lo = leachate produced (m^3).
AR = actual rainfall (1.064m) used for active phase. For temporarily restored phases, infiltration rate is estimated at worst case 30% of actual rainfall.
Evapotranspiration assumed to be zero.
ER = Effective rainfall (0.651m) used for permanently capped phases. Infiltration into restored phases is 10% of ER at worst case.
A = area of cell/phase (m^2)
a = absorptive capacity of the waste (m^3/t). Absorptive capacity of 0.1m^3/tonne used in active cells. Absorptive capacity for temporary and permanently capped areas assumed to be zero.
W = weight of waste deposited (t/a).

1) **Estimated leachate generated in Phases 1-5 if proposed landfilling allowed with no lining. It is assumed that all phases are temporarily capped except the active phase.**

For active phase:
Lo = [1.064m x 19,600m^2] – [0.1 x 16,000]
= 20,854 – 1,600
= 19,254 m^3/annum is estimated average leachate produced per active phase.

For temporarily restored phases:
Lo = 78,400m^2 x 1.064 x 30/100
= 25,025 m^3/annum is estimated leachate produced by all the temporarily covered phases.

44,279 m^3/annum or an additional 121m^3/day is the estimated quantity of leachate which would be generated if Phases 1-5 are unlined.

2) Estimated quantity of leachate generated in Phases 1-5 if permanently capped
Lo = [ER(A)] x 10/100
= 98,000m^2 x 0.651 x 10/100
= 6,379 m^3/annum or 17m^3/day of leachate produced if Phases 1-5 permanently capped.

Conclusions: The above calculations indicate that allowing the additional nine months of landfilling will result in an additional 28,425 m^3 (37,900 m^3/annum) of leachate being produced over the amount of leachate produced if landfilling were to cease in June 2003 and the area permanently capped.

There is a leachate collection system and treatment plant at the facility and in 2001, 79,282m^3 (or 217 m^3/day) of leachate was discharged to sewer. There is therefore spare capacity to treat and discharge to sewer an additional 139,718m^3 /annum of leachate. Provision of additional leachate abstraction boreholes and diversion to the treatment plant will ensure that measures are in place to manage leachate generated by the additional months of landfilling.