



**Environmental Management Services**  
**Comhairleoirí Comhshaoil**  
**Environmental and Planning Consultants**

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**An Tinteán Nua, Ballymanus, Castlepollard, County Westmeath**  
**An Tinteán Nua, Baile Mhánais, Baile na gCros, Co. an Iarmhí, N91 PP76.**

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12 September 2022

Ms Ewa Babiarczyk,  
Inspector,  
Circular Economy Programme,  
Office Of Environmental Sustainability,  
Environmental Protection Agency,  
PO Box 3000,  
Johnstown Castle Estate,  
County Wexford,  
Y35 W821.

By email to: [historiclandfillapplications@epa.ie](mailto:historiclandfillapplications@epa.ie)  
and to: [licensing@epa.ie](mailto:licensing@epa.ie)

Dear Ms Babiarczyk,

**Closed Historic Landfill at Ballymulvey, Ballymahon, County Longford**  
**Application by Longford County Council for a Certificate of Authorisation**  
**under the Waste Management (Certification of Historic Unlicensed Waste**  
**Disposal and Recovery Activity) Regulations, 2008**  
**Application Registration No. H0296-01**

I was recently requested to prepare an environmental report on a planning application for a proposed development less than 2.0 km from the closed historic landfill at Ballymulvey, Ballymahon County Longford; and, while researching the issues which may affect this planning application, I took the opportunity to visit the Agency's website on the licensing of historic unregulated landfills.

I was aware that Longford County Council had made an application for a Certificate of Authorisation under the above Regulations, and I noted that on 31 March 2022, you wrote to the Council, requesting a number of additional items of further information in accordance with Regulation 7(4) of the above Regulations.

Among the items which you requested were:

1. Information on the ownership of the land on which the Ballymahon landfill site is located, as this appeared to be "unregistered land"; and whether the Council intended to register ownership of the site with the PRAI (item 1);

2. A copy of the High Court Order, following which landfilling operations at Ballymulvey ceased (Item 3); and,
3. Information on what waste was deposited in the area referred to as “*area of special precautions; area shaded to be protected to ensure that this area is not disturbed or exposed by any proposed works*” (item 5).

I do not know whether Longford County Council has responded to your queries (at least there was no indication on your website about whether or not they have done so), but in any event I thought it would be helpful to provide the Agency with some possibly relevant information, particularly as I was involved in the original legal proceedings, and I have some direct knowledge of the case and subsequent events.

**1. Information on Ownership of the Land on which the Historic Ballymahon Landfill is located**

Item 1 of the further information request noted that Section B.1 of the Application Form indicated that the landfill site in question lies on “*unregistered land with PRAI but owned by Longford County Council*”; and you very appropriately asked the County Council if ownership of the site will be registered with the PRAI.

I cannot tell you whether Longford County Council has registered with the Property Registration Authority (PRAI) the land comprising the subject site, as that is a matter for the County Council; but I can inform you that, according to local information, the land was previously an area of bog on which turf was cut by families living in the neighbourhood, i.e., mainly in the townland of Ballymulvey, but also some from the nearby town of Ballymahon.

Unfortunately, the local families who exercised turbary rights on the land which subsequently became Ballymulvey landfill apparently no longer have any records of the plots which they leased or owned, and the nineteenth century maps show no turf cuttings in the area. However, the drawing in the Tier 2 Assessment report, dated 22 November 2018, showing the quaternary geology of the site, indicates that the landfill is located on a large area of cutover peat.<sup>1</sup>

The landdirect.ie website of the PRAI (<https://www.landdirect.ie/>) and map viewer confirm that the land is not registered with the Land Registry; but it is possible that Longford County Council may be able to find in their records the names of the original owners.

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<sup>1</sup> Tier 2 Assessment, Ballymulvey Historic Landfill Site, Fehily Timoney and Company, 22 November 2018; Section 2.2.4, Geology, Figure 2.2 Quaternary Geology, page 7.

## 2. The High Court Order

I hope to be able to provide the Agency with some relevant information on the High Court Order which led to the eventually closure of the Ballymahon landfill, as I was one of the expert witnesses in the High Court proceedings.

The background to the Order can be traced to the unsatisfactory state of the Ballymulvey landfill since the 1970s, leading to complaints by local residents as a result of foul odours, swarms of flies and numbers of rats which were associated with the site. The situation was exacerbated by the expansion of the landfill throughout the 1980s, by the greater activity on the site as increasing amounts of wastes were being deposited, and by the knowledge that some of these wastes were hazardous or toxic, including quantities of asbestos-contaminated material.

In 1987, the landfill was upgraded to take an increasing volume of waste, to the extent that it was receiving 67 % of the total volume of waste produced in County Longford. According to Longford County Council's "Waste Disposal Plan 1988", a number of industrial concerns in Longford town "*have to bring their waste to the main tiphead at Ballymahon, as the tiphead at Cartron (about 5 miles outside the town) was closed down in 1987*", while the Plan stated that 12,700 tonnes of waste were landfilled at the Ballymahon tiphead in 1987.<sup>2</sup>

The 1988 Waste Disposal Plan also stated that "*sludge and liquid waste are tipped into a trench in an area already filled with waste*" and "*the overflow from this trench spills onto the bog adjoining the tipping area*". The Plan described the situation as "*not very satisfactory and arrangements will be made to enable sludge to be tipped over the working face as recommended*".

A report by Malachi Cullen and Partners, dated 04 May 1992, describes that when the landfill was inspected in or about 1987, it "*was basically an unmanned tiphead in the classic description a 'Dump'*". By 1992, "*the overall operation of the Ballymahon Landfill site is not ideal, but is a great improvement on the operation first witnessed in 1987*".<sup>3</sup>

The unacceptable state of Ballymulvey landfill was confirmed by Longford County Council's Director of Community Care, Dr S. Ryan, who wrote in 1992 that:<sup>4</sup>

*"the dump is unsatisfactory because of the quantity and variety of exposed refuse on site and thereby creates a public health nuisance"*

Dr Ryan's comments, and a report by the County Council's Environmental Health Officer attached to Dr Ryan's letter, was followed by a report from Mr Malachi

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<sup>2</sup> Longford County Council, Waste Disposal Plan 1988; prepared by G.C. McGlinchey, County Engineer; paragraphs 2.2.4 and 3.4.1.1.

<sup>3</sup> Report on the Management and Operation of the Ballymahon Landfill Site. Malachi Cullen and Partners, Consulting Engineers, Athlone; 04 May 1992.

<sup>4</sup> Letter dated 30 April 1992 from Dr. S. Ryan, Director of Community Care, Midland Health Board, Longford, to Mr. M Killeen, County Manager, Longford County Council.

Cullen, Consulting Engineer, who inspected the landfill site on 01 May 1992, and reported that:

- ❖ Sludge from the County Council's sewage and wastewater treatment plants was being deposited on the site by "lagooning";
- ❖ Refuse deposited on the site was not being adequately compacted;
- ❖ The "cell" method was only nominally adopted; and,
- ❖ The deposited wastes were covered only once per annum instead of daily covering.<sup>5</sup>

The reason for the County Council's interest, at that time, in the condition of the landfill was because, on 06, 07 and 08 April 1992, a group of local residents had placed a picket at the entrance to the Ballymulvey site, preventing vehicles or persons from entering or leaving. On 10 April 1992, an interim injunction was granted to Longford County Council against three people engaged in picketing, prohibiting them and others from carrying out any further picketing of the dump.

In response, some 14 local residents began a nuisance action against the County Council, seeking an injunction and damages; while the County Council sought a further injunction against the persons involved in picketing the dump. The residents also sought an Order against the Council requiring that the dump should be closed, and an Order for attachment of the County Manager and the Senior Executive Engineer responsible for the operation of the landfill. The effect of this second Order, if granted, would have been the committal to prison of both these officials.

On 28 April 1992, applications for these injunctions and Orders were heard by the Circuit Court in Sligo, and the proceedings were adjourned to a special sitting of the Circuit Court in Longford on 04 May 1992. At that sitting, Judge Matthew Deery upheld the concerns of the local residents, and ordered the closure of the landfill within one month, noting that failure to do so would find the County Manager in contempt. A second order made by the Court was a mandatory injunction requiring the County Council to close the landfill in four months and to cover it over. The Judge also awarded each of the Plaintiffs an amount of IR£ 1,000 for damages.

Despite an appeal by Longford County Council, the Circuit Court refused to grant a stay on the first of these orders. The matter was then heard on 04 June 1992 in the High Court, which granted an interim stay on the prohibitory injunction until the hearing of an appeal. The appeal was heard in Longford on **06 October 1992**; when a settlement was reached between the local residents and the County Council officials after a day of negotiation.

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<sup>5</sup> Report on the Management and Operation of the Ballymahon Landfill Site. Malachi Cullen and Partners, Consulting Engineers, Athlone; 04 May 1992. Quoted again in section 4 below.

The terms of the settlement were initially based on the recommendations of a report which I had produced on behalf of the Plaintiffs, after inspecting the landfill site on 01 September 1992. The text of the settlement was drafted by the writer of this report, i.e., by myself, in collaboration with Mr Jack Kilgallen, Senior Executive Engineer of Longford County Council, and with Mr Malachi F. Cullen, Engineer, of Malachi Cullen and Partners, Consultants to Longford County Council. The terms of the settlement were subsequently approved by the legal teams acting for each side, and became an Order of the High Court by Consent, made by Mr. Justice Blaney on 6 October 1992.

In order to provide the agency with a full understanding of the High Court Order, I am attaching the following three documents:

1. a scanned copy of my report on the Ballymulvey Landfill Site, dated 28 September 1992, as this report includes recommendations on which the Consent Order was based;
2. a scanned copy of my contemporaneous handwritten notes dated 06 October, entitled "Heads of Agreement", with many corrections and amendments, reflecting the discussion which took place on that day, and signed by Mr Malachi Cullen and myself on the last page (there are many references in these notes to my report dated 28 September 1992); and,
3. a scanned copy of the Consent Order, also dated 06 October 1992 (this being the High Court Order which you requested in your letter of 31 March 2022 to Longford County Council).

The terms of the High Court Order, including Schedules A and B which form part of the Order, required:

- i) the landfill to be closed by 01 January 1995, with no more waste being accepted for disposal after that date;
- ii) from 06 October 1992 until closure of the landfill, only domestic waste, non-toxic commercial and non-toxic industrial waste can be deposited in the landfill, and no further amounts of offal, farm waste, dead animals, portions of dead animals, asbestos, oils, lubricants, toxic wastes, or any sewage in liquid form;
- iii) the landfill would have to be managed in a way described in detail in the Consent Order, so as to prevent further nuisance and to ameliorate or reduce its adverse effects on the environment; and these works must be completed by 01 January 1995;
- iv) following closure of the landfill, Longford County Council was required to rehabilitate the site in accordance with the detailed measures set out in the Consent Order, and these works must be completed by 01 January

1998, i.e., the Council was given a further three years after closure of the landfill to completely rehabilitate the site; and,

- v) Longford County Council was required to pay the costs which the local residents (the Plaintiffs) had incurred in the Circuit Court and the High Court.

Following the settlement agreement described above, and even before the Order was finally agreed and perfected by Counsel for both parties, the local residents group observed that the landfill was not being managed in accordance with the terms of the settlement. For example, offal and dead animals had been deposited on the landfill,<sup>6</sup> management and environmental monitoring were not being carried out as required, and the landfill was not adequately fenced and secured from unauthorised access.

On a more serious level, the Plaintiffs had obtained definite information that asbestos-contaminated material had been deposited on the landfill in July 1987; depositing this waste was contrary to legislation; the location was not known with any degree of accuracy, and the location had not been marked. This issue is addressed in section 3 below.

This further complaint, that the terms of the Consent Order were being breached by Longford County Council, was initially heard at Tullamore Circuit Court on 05 November 1992, and was adjourned to January 1993, on the grounds that the County Council admitted a breach of the Order and undertook to improve security at the site.

On 29 January 1993 the case was heard at Longford, but adjourned to 10 February and subsequently to 26 February for hearing in Sligo Circuit Court; and was then further put back to 23 March 1993 in Longford. The case was eventually listed for 15 June 1993 at Longford Circuit Court, by which time the County Council had decided to close the landfill, and to cease all further deposition of waste on the site.

Following the closure of the landfill, the Plaintiffs alleged that there were several non-compliance issues with the terms of the Consent Order.

One of these non-compliances was the use of power station fuel ash (which is classified as a waste) as a cover material, while another was the absence of any impervious layer to shed rainfall and reduce the production of leachate.

The Plaintiffs also alleged that there was little or no information about the types and quantities of wastes deposited, and about the extent to which leachate or other polluting materials have migrated from the landfill site, leading to continuing public concern about the long-term environmental consequences of the landfill.

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<sup>6</sup> Letter dated 28 July 1992 from Mr P.J. Walsh, Ballymahon Environmental Group, to Mr P. Murphy, County Secretary, Longford County Council.

According to local information, significant quantities of toxic waste from metal processing and other industries in Ballymahon had been deposited in the landfill.

Two further problems which appear to be unresolved are the legal status of the buried asbestos-contaminated material, and the escape of methane from the landfill.

### **3. Type of Waste Deposited in the “Area of Special Precautions”**

Your letter also requested information on what waste was deposited in the area referred to as “*area of special precautions; area shaded to be protected to ensure that this area is not disturbed or exposed by any proposed works*” (item 5); and I hope that the following information will be helpful to the Agency.

The type of waste buried in the “*area of special precautions*” consists of asbestos-contaminated material from Lanesborough Electricity Generating Station, County Longford.

On 29 May 1987, the Electricity Supply Board requested Capco Limited, Dublin, specialists in asbestos removal, to remove and dispose of asbestos and fibreglass insulation from boilers and pipework in this electricity generating station. The removal contract commenced on 03 June 1987, and Capco applied to Longford County Council for permission to dispose of the asbestos-containing material in the landfill site at Ballymahon.<sup>7</sup> However, there appears to be no record of the actual application to dispose of this hazardous material in an operating landfill accepting domestic and commercial wastes.

On 08 July 1987, Longford County Council wrote to Capco Limited stating that the asbestos waste would be acceptable under certain conditions<sup>8</sup>, and on 21 July 1987 Capco Limited advised ESB at Lanesborough that permission had been obtained.

Details of the burial of asbestos-contaminated material on the Ballymulvey landfill were not known until Mr P.J. Walsh and the late solicitor Mr Barra Flynn (on behalf of the local residents) obtained ‘Discovery’ in preparation for the Circuit Court case which was heard in Longford Circuit Court on 04 May 1992.<sup>9</sup>

These details were obtained from a diary kept by Mr Cormac Daly, a former employee of Longford County Council, who provided this information to the Council on 20 May 1992 (five years after he had witnessed the burial of the

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<sup>7</sup> Letter dated 19 June 1987 from Capco Limited, Dublin, to Electricity Supply Board, Lanesboro, County Longford, with claim for variations and additional work, and stating that Capco has “*applied to Longford County Council for permission to dispose of the asbestos waste in the local dump at Ballymahon*”.

<sup>8</sup> Letter dated 08 July 1987 from Cormac Daly, Longford County Council, to Capco Limited, Dublin.

<sup>9</sup> Motion for Discovery dated 10 July 1992 by Tormey and Company, Solicitors for the Plaintiffs, and served on E.C. Gearty and Co., Solicitors for the Defendants, on 13 July 1992.

asbestos-contaminated material), describing how he supervised the “disposal” of the asbestos-contaminated material at Ballymulvey in 1987. Mr Cormac Daly described how on 29 June 1987 he telephoned Capco Limited and went to Lanesborough in order to check the asbestos bags at the electricity generating station. He reported that the amount was approximately 30-40 tonnes, the asbestos waste was double-bagged, and had been correctly marked with the appropriate sign: “Danger – Asbestos – do not inhale”.

On 16 July 1987, Mr Daly met with Capco representatives at the Ballymulvey landfill site and he arranged with them that the asbestos would be buried in the landfill during the following week. It was agreed that Capco would provide a digger, but on Monday 20 July 1997, Mr Daly found that Capco had dug the burial pit in a wrong place in the landfill, and therefore he telephoned Lanesborough Power Station and stopped the operation.

On 22 July 1997, Capco returned to the Ballymulvey landfill, a further pit had been dug, the first load of asbestos-contaminated material had arrived, and by Thursday, 23 July the Capco digger had nearly filled the hole, and the digger had left the site. On Saturday 25 July 1997, another digger driver dug a further hole or pit for Capco; and, on Monday 27 July, Mr Daly drove to Lanesborough to check the loading of the asbestos-contaminated material, and he then came back to Ballymulvey to supervise the burial of the asbestos. Longford County Council’s bulldozer was used on site for a short period; two of the County Council’s men worked until 7:30 p.m.; and the job was finished by 8:00 p.m. on that day.

According to the comprehensive details provided by Mr Cormac Daly, some 2.5 container loads of asbestos waste were buried; the depth of the hole was 8 feet (2.4 metres), the depth of the embankment above the hole was between 8 and 10 feet (2.4 to 3.0 metres); the depth of the bagged asbestos waste buried in the hole was approximately 6 feet (1.8 metres); the depth of sand cover over the bags was between 2 and 3 feet (0.61 to 0.9 metres), the depth of refuse cover over the sand was 3 to 4 feet (0.9 to 1.22 metres); the depth of final cover over the waste, sand and refuse, was 10 to 12 feet (3.0 to 3.66 metres; and what he describes as “*end of day cover*” was 6 feet (1.8 metres).

Mr Cormac Daly had also produced a drawing showing the approximate location of the buried asbestos waste. His drawing shows a trench, 4m in width and 13m in length, with an extension of a smaller trench also 4m in width and 6 metres in length. The trench was 10m from the line of a boundary fence and 75m from what appears in his drawing to be another boundary of the landfill.

While the drawing was helpful, it was not entirely clear, and therefore on a facsimile cover sheet attached to the extracts from his diary, Mr Cormac Daly



clarified that *“the 75m in the sketch is to the front roadside fence and the 10m is to the boundary adjoining the silt/sand deposits”*<sup>10</sup>

During subsequent inspections of the landfill on behalf of the local residents (Plaintiffs in the legal proceedings described in section 2 above), I noted that there were no visible markers on the surface of the landfill, indicating where asbestos from the Lanesborough electricity generating station had been buried, despite it being a requirement of the Consent Order that the burial site of the asbestos should be visibly marked.

It would be reasonable to conclude that the lack of any visible markers, compounded by the extensive earth-moving on the landfill in subsequent years, renders it impossible to discover at the present time the true whereabouts of the buried asbestos.

It is our understanding that burial of asbestos without proper precautions<sup>11</sup> is also in breach of EU Directive 2009/148/EC of 30 November 2009 and the relevant Regulations transposing this Directive into Irish law. At the time when the asbestos-contaminated waste was buried, the disposal of this material in the Ballymulvey landfill may also have been in breach of the Factories (Asbestos) Act, 1975, and the European Communities (Toxic and Dangerous Waste) Regulations, 1982.

It is also appropriate to draw attention of the Agency to a Resolution of the European Parliament, dated 14 March 2013, concerning asbestos-related health threats, aiming to eliminate all existing asbestos risks. That Resolution cautioned that the disposal of asbestos waste to landfills, even on a temporary basis, was not the safest or most appropriate way of definitively eliminating the potential release of asbestos fibres into the environment (particularly into air and groundwater), and the Resolution proposed that it would be far more preferable to deal with asbestos waste by rendering it inert. Placing asbestos waste in landfills, according to the Resolution, only leaves the problem to be dealt with by future generations, as asbestos fibres are virtually indestructible over time.<sup>12</sup>

According to the Health and Safety Authority:

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<sup>10</sup> Facsimile cover sheet headed “Cork County Council, Executive Engineer’s Office, Wolfe Tone Square, Bantry, County Cork”, dated 20 May 1992 and addressed to Mr Jack Kilgallon [Senior Executive Engineer Longford County Council], and signed “Cormac”. A handwritten note on the cover sheet asks that the document should be filed under “Ballymahon Tiphead” and that a copy should be sent with a compliment slip to Mr Frank Gearty, Solicitor.

<sup>11</sup> Asbestos waste, debris or contaminated material should be placed into a suitable, UN-approved red bag which displays the appropriate asbestos warning label, and then sealed with tape. The red bag should then be wiped clean before being carefully placed into a suitable approved clear asbestos bag which should then also be sealed. The waste bags must be labelled to identify that they contain asbestos waste.

<sup>12</sup> European Parliament Resolution of 14 March 2013 on Asbestos-Related Occupational Health Threats and Prospects for Abolishing all Existing Asbestos (2012/2065(INI)) (2016/C 036/16). Official Journal of the European Union, 29.1.2016; pages C 36/103 to C 36/110.

*“Prior to any removal work, as part of developing the plan of work, a suitable facility for disposal should be identified. The collection, transport and disposal of asbestos waste should only be undertaken by a waste collection permit holder and waste should be sent to an appropriately authorised facility. These facilities accept asbestos-containing waste and then arrange to have the **waste disposed of at an appropriate facility abroad** [our emphasis]”.*<sup>13</sup>

It is clear from these guidelines that, in 2013, there was no facility in Ireland for the safe and legal disposal of asbestos-containing materials.

Further information on the burial of asbestos-contaminated waste is provided in the Tier 1 and Tier 2 Risk Assessment Reports, copies of which have been given to the Agency by Longford County Council, in support of the Council’s application on 17 September 2021 for a Historic Landfill Certificate of Authorisation.

The **Tier 1 Assessment** of Ballymulvey Landfill, prepared for the Council by AECOM, and dated 27 September 2017, includes a desk study and document review (though none of the reports which Mr. P.J. Walsh (representing the Plaintiffs in the above legal proceedings) had provided to Longford County Council were reviewed, which suggested that the consultant had not been provided with copies of these reports), a report of a brief site walkover undertaken on 20 July 2017, some 30 photographs taken during the site walkover, a summary of monitoring data, and a preliminary risk screening and assessment.

Drawings showing the location of the buried asbestos-contaminated material were provided in Appendix A, Figure 2, and Appendix B (site plans F061-01-A and F061-02-B) of the report.

The **Tier 2 Assessment** of Ballymulvey Landfill, prepared for the Council by Fehily Timoney and Company, and dated 22 November 2018, includes the following brief mention of the burial of asbestos-contaminated material:

*“From the limited records that are available, it appears that the ACM waste originated from Lanesborough Power Station, located 20 km north-west of the site. The ACM waste was accepted on site between 22 and 27 July 1987 and was brought to site double-bagged and marked as ‘Danger Asbestos’ and ‘Do Not Inhale’. A discrete hole was excavated 75 m in from the roadside boundary and 10 m from the north-western boundary fence. The excavation was 19 m in length (parallel to the L1121) and 4 m in width (parallel to the boundary fence). Records indicate that approximately 1.8 m of double-bagged ACM waste was buried beneath of 0.6m to 1.0m of sand, with an additional 1.2m layer of refuse above this.*

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<sup>13</sup> Asbestos-containing Materials (ACMs) in Workplaces – Practical guidelines on ACM Management and Abatement. Published in 2013 by the Health and Safety Authority, The Metropolitan Building, James Joyce Street, Dublin 1. Section 17, Management and Disposal of ACMs, page 115.

*The final cover on the ACM is estimated to be between 3 m to 3.7 m in thickness*".<sup>14</sup>

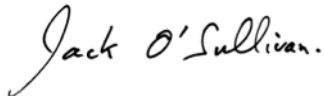
To summarise the information provided above, it is clear that a significant quantity of asbestos-contaminated material has been deposited in the Ballymulvey landfill site; and, even though reasonably comprehensive details of the burial have been provided, this information is dated some five years after the waste was accepted and buried, and the precise location of this buried waste is not known with certainty.

The Agency will be aware that the initial **Tier II Risk Assessment** concludes that the site should be classified as High Risk, and the consultants have recommended that a Tier III Environmental risk analysis be undertaken including a **Detailed Quantitative Risk Assessment (DQRA)**.

Also remaining is the final decision about whether or not to leave the asbestos-contaminated material in situ, or to remove it. It is my understanding that this decision will have to be made by the Environmental Protection Agency, and will be based on a careful evidence-based and risk-based assessment of both options.

I hope that the above information, and the scanned documents contained in the Annex, will be helpful.

Your sincerely,



Jack O'Sullivan

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<sup>14</sup> Tier 2 Assessment, Ballymulvey Historic Landfill Site, Fehily Timoney and Company, 22 November 2018; Section 2.2.9, Site Development History, pages 14-15.



**Environmental Management Services**  
***Comhairleoirí Comhshaoil***  
**Environmental and Planning Consultants**

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12 September 2022

**Observations to the Environmental Protection Agency on the Closed  
Historic Landfill at Ballymulvey, Ballymahon, County Longford**  
**Application by Longford County Council for a Certificate of Authorisation;  
EPA Registration No. H0296-01**

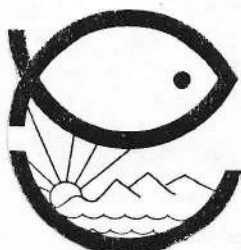
***Letter to Ms Ewa Babiarczyk, Inspector, Circular Economy Programme,  
Office Of Environmental Sustainability***

## **ANNEXES**

1. Scanned copy of report by Jack O'Sullivan, Environmental Management Services, on the Ballymulvey Landfill Site, dated 28 September 1992.
2. Scanned copy of contemporaneous handwritten notes by Jack O'Sullivan, dated 06 October, entitled "Heads of Agreement".
3. Scanned copy of the Consent Order, dated 06 October 1992, requested by Ms Ewa Babiarczyk in her letter to Longford County Council, dated 31 March 2022.

ENVIRONMENTAL MANAGEMENT ASSOCIATES

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ENVIRONMENTAL ASSESSMENT OF LANDFILL SITE AND OPERATIONS  
AT BALLYMULVEY, BALLYMAHON, COUNTY LONGFORD

A Report to

The Ballymahon Environmental Action Group

Environmental Management Services

Osborne House, Seapoint Avenue,  
Monkstown, County Dublin.

Telephone           01-280-7867  
Fax                   01-280-3925

28 September 1992

ENVIRONMENTAL MANAGEMENT ASSOCIATES

ENVIRONMENTAL ASSESSMENT OF LANDFILL SITE AND OPERATIONS  
AT BALLYMULVEY, BALLYMAHON, COUNTY LONGFORD

CONTENTS

	Page
1. BACKGROUND .. .. .	1
1.1 The Ballymulvey Landfill Site .. .. .	1
1.2 Disposal of Asbestos Wastes .. .. .	2
1.3 Disposal of Other Hazardous Wastes .. .. .	2
1.4 Legal Actions .. .. .	3
2. TERMS OF REFERENCE AND SCOPE .. .. .	4
3. SITE VISIT AND INSPECTION .. .. .	4
4. ENVIRONMENTAL ASSESSMENT OF EXISTING LANDFILL	6
4.1 Environmental Setting and Location .. .. .	6
4.2 Geology and Hydro-geological Conditions .. .. .	6
4.3 Water Quality and Related Issues .. .. .	8
4.3.1 Analysis of Water Samples by ESB	8
4.3.2 Analysis of Water Samples by Eolas	10
4.3.3 General Comments on Water Quality and on Control of Surface Water Pollution from the Landfill Site	11
4.3.4 Water Management .. .. .	14
4.3.5 Containment of Leachate .. .. .	15
Containment Sites .. .. .	16

## CONTENTS, Contd

		Page
4.3.5	Containment of Leachate, Contd	
	Sites Allowing Slow Migration of Leachate .. .. .	16
	Sites Allowing Rapid Migration of Leachate .. .. .	17
	Bog Sites .. .. .	17
4.3.6	Treatment and Disposal of Leachate	18
4.3.7	Conclusions Regarding Water Management and Control of Leachate	21
4.4	Windblown Litter .. .. .	22
4.5	Air Pollution .. .. .	22
4.6	Deterioration in the Visual Quality of the Landscape .. .. .	23
4.7	Vermin, Birds and Risk of Disease Transmission to Animals and People .. ..	23
4.8	The Presence of Asbestos on the Site ..	24
4.8.1	Health Effects of Asbestos ..	25
4.8.2	Development of Statutory and International Controls .. ..	26
4.8.3	Assessment of Site Suitability for Long-term Safe Storage of Asbestos-contaminated Wastes ..	27
4.9	Further General Comments on Recent and Existing Landfill Site Management .. ..	30
5.0	POSSIBILITIES FOR AMELIORATION OF ADVERSE IMPACTS	31
6.0	THE IMPACT OF THE E.C. DRAFT DIRECTIVE ON THE LANDFILL OF WASTE .. .. .	33

Contd

CONTENTS, Contd

	Page
7.0 OVERALL LANDFILL SITE COSTS .. .. .	34
8.0 RECOMMENDATIONS .. .. .	36

TABLES  
-----

TABLE 1: LOCATIONS OF WATER SAMPLES COLLECTED AND ANALYSED BY THE ELECTRICITY SUPPLY BOARD IN THE VICINITY OF THE BALLYMULVEY LANDFILL SITE .. .. .	9
TABLE 2: RESULTS FROM ANALYSES OF WATER SAMPLES COLLECTED BY THE ELECTRICITY SUPPLY BOARD IN THE VICINITY OF THE BALLYMULVEY LANDFILL SITE .. .. .	10
TABLE 3 : SAMPLING LOCATIONS AND RESULTS FROM ANALYSES OF WATER SAMPLES COLLECTED BY EOLAS IN THE VICINITY OF THE BALLYMULVEY LANDFILL SITE .. .. .	11
TABLE 4 : TYPICAL COMPOSITION OF LEACHATE FROM RECENT AND AGED DOMESTIC WASTES .. ..	12
TABLE 5 : BREAKDOWN OF TOTAL LANDFILL SITE COSTS -- FROM SITE ASSESSMENT AND ACQUISITION TO FINAL CLOSURE AND AFTERCARE .. .. .	35

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# ENVIRONMENTAL MANAGEMENT ASSOCIATES

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## ENVIRONMENTAL ASSESSMENT OF LANDFILL SITE AND OPERATIONS

### AT BALLYMULVEY, BALLYMAHON, COUNTY LONGFORD

#### 1. BACKGROUND

##### 1.1 The Ballymulvey Landfill Site

The Ballymulvey landfill is one of three refuse disposal sites operated by Longford County Council, the others being at Drumlish and Granard. It is located on bogland in the extreme south of the county, 22 Km from Longford Town and only 2 Km from the town of Ballymahon. Because of its proximity to the latter town, the site is frequently referred to as the Ballymahon dump or tiphead.

It is understood that Ballymulvey has been operated as a disposal site since the early 1970s and, following closure of the former tiphead at Cartron in 1987, the Ballymulvey site was upgraded to take an increasing volume of waste. According to Longford County Council's Waste Disposal Plan (1988), all types of waste are accepted except hazardous and toxic wastes, and in 1987 the site was receiving 67 % of the total volume of waste tipped at local authority sites in County Longford.

The area of the site is approximately 5.47 hectares (13.5 acres) and, according to local information, the site is being used for the co-disposal of commercial and industrial wastes in addition to receiving increasing quantities of domestic waste.

## 1.2 Disposal of Asbestos Wastes

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In 1968 the Electricity Supply Board decided that no further insulation/lagging materials containing asbestos would be used in electricity generating stations, and a general programme for the replacement of asbestos-containing materials was formulated for each station.

On 29 May 1987 the Electricity Supply Board requested Capco Limited, Dublin, specialists in asbestos removal, to remove and dispose of asbestos and fibreglass insulation from boilers and pipework in Lanesboro Electricity Generating Station. The removal contract commenced on 3 June, and Capco then applied to Longford County Council for permission to dispose of the asbestos waste in the landfill site at Ballymahon.

On 8 July Longford County Council wrote to Capco stating that the asbestos waste would be acceptable under certain conditions, and on 21 July Capco advised ESB at Lanesboro that permission had been obtained. According to information supplied by an engineer employed by Longford County Council at the time, the asbestos waste was buried at the Ballymahon site between 22 and 27 July 1987. The manner in which it was buried, and the conditions under which the burial operation was carried out, are discussed later in this report.

## 1.3 Disposal of Other Hazardous Wastes

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Local residents have also expressed concern about the likely dumping of cyanide wastes at the Ballymahon site. Such wastes would have arisen from the operation and subsequent closure (in November 1989) of Metal Treatments (Ireland) Limited at Athlone Road, Ballymahon. This firm carried out electroplating, and while it was in operation there were a number of incidents of pollution and fish kills in the River Inny, into which the factory had permission to discharge trade effluent.

Metal treatment plants use materials which are highly toxic; these include metal salts and organic complexes containing metals such as zinc, copper, nickel and chromium, together with cyanide solutions. After use, these plating solutions are contaminated and must be disposed of as toxic wastes, along with metal-rich sludges which accumulate in the plating tanks.

Following closure of the plant, large quantities of these chemicals were removed in August 1990 by a specialist waste disposal firm, Shannon Environmental Services, under the supervision of an advisor from Eolas. Both Shannon Environmental Services and Eolas were engaged by M. A. Stephens and Company, Chartered Accountants, Mullingar, in their capacity as liquidator of Metal Treatments (Ireland) Ltd.

The ultimate destination and fate of the chemicals is not known, nor has it been ascertained how or where Metal Treatments (Ireland) Limited disposed of the toxic liquids and sludges which would have been produced as wastes during the operation of the plant.

#### 1.4 Legal Actions

Arising from the above concerns about asbestos and other possible toxic substances, and from the way in which the landfill site was operated by Longford County Council, a group of local residents placed a picket at the entrance to the Ballymulvey site on 6 April 1992, preventing any vehicles or persons from entering or leaving. As a consequence, Longford County Council sought an injunction to prevent further picketing.

Around the same time, the local residents began a nuisance action against the County Council, seeking an injunction and damages. On 4 May, the Circuit Court in Longford held for the local residents and against the County Council, granting an order or injunction prohibiting the County Council from continuing to use the dump after the expiration of one month from the date on which the injunction was granted. A second order made by the Court was a mandatory injunction requiring the County Council to close the dump in four months and to cover it over.

On appeal, the Circuit Court refused to grant a stay on the first of these orders. The matter was then heard on 4 June 1992 in the High Court which granted a stay on the prohibitory injunction until the hearing of an appeal. This appeal is listed for hearing in Longford on 9 October.

In preparation for the appeal, Mr P.J. Walsh, Secretary of the group of local residents, contacted Mr Jack O'Sullivan of Environmental Management Services and requested an examination of the Ballymulvey site and an assessment of its suitability for continued use as a landfill.

## 2. TERMS OF REFERENCE AND SCOPE

It was agreed that our report would cover the following topics:

- i) assessment of the environmental impact of the existing landfill operation at Ballymulvey;
- ii) assessment of whether or not the Ballymulvey site is suitable for continued use as a landfill site for the reception of municipal and other wastes;
- iii) an examination, on the basis of available documents and reports, of whether or not the disposal of asbestos on the site was carried out in accordance with regulations and good practice.

Because of the need to complete our report and conclusions some weeks ahead of the hearing on 9 October, a detailed site investigation could not be undertaken, and the report is based on one relatively brief site visit and an examination of documents. It cannot therefore be fully comprehensive, but nevertheless presents as complete a picture as possible of conditions at the landfill site.

## 3. SITE VISIT AND INSPECTION

The site was visited and inspected by Jack O'Sullivan of Environmental Management Services on Tuesday 1 September 1992 and the terms of reference were discussed with Mr P. J. Walsh and with Tormey and Company, Solicitors, Athlone.

Copies of reports, affidavits and other documents produced during the previous hearings were supplied by Tormey and Company, and these were also studied in detail.

At the time of our visit, a considerable amount of earth-moving had been carried out, and the landfill site was partially surrounded by bunds composed of a mixture of mature and semi-mature refuse, mixed and topped in places with fine silt excavated from the field immediately adjacent to the north-western perimeter of the landfill.

Access was obtained without any difficulty, as the perimeter wall and fence were complete only along the north-east side of the site adjacent to the road. The surface of the landfill was very wet, with pools of contaminated surface water in many places, while low-lying areas contained dark-coloured lagoons of leachate on which floated quantities of refuse.

The northern portion of the site, known as cell 3, had been built up very recently into a kind of artificial plateau, partially encircled by clay and refuse bunds surmounted along two sides by posts evidently intended for a chain-link fence. This plateau was elevated approximately 10 metres above the surrounding land, and constituted a significant visual intrusion. This was confirmed by the observation that from the top of the bund excellent views of the surrounding farms and landscape were obtained.

This cell appeared to be in active use, uncovered refuse was present on the surface, and a large flock of birds which had been feeding or resting on the refuse rose into the air on our approach.

The central portion of the site, known as cell 2, had been partially covered by fine silt, the surface of which was very wet and which drained to the lagoon area to the south.

The southern portion of the site, known as the lagoon, was relatively low-lying, and was also surrounded by a recently constructed bund of refuse and silt. It contained areas of very soft, boggy and dangerous ground, together with a large pool of leachate on which refuse was floating. An active tipping face was also observed in this area.

During our site inspection, it was impossible not to be aware of a noxious odour, typical of poorly managed landfill sites. There was no evidence of any highly odorous toxic chemicals, but this would not rule out the possibility that chemical wastes had been dumped in the past. A number of empty plastic chemical drums were observed, but it was not possible to get close enough to them safely in order to read any labels or hazard markings that may have been present.

The field immediately adjacent to the north-western perimeter of the landfill had been excavated in a number of places, leaving lagoons containing silt-laden water. Drainage ditches had been dug to lower the water level, and to drain the surface run-off to a small stream which flowed to the River Inny.

Immediately to the north of this field, and close to Toome Cross Roads, a number of travellers' caravans were parked, and it appeared very likely that this small settlement used the landfill site as a source of materials and objects for trading and re-cycling.

#### 4. ENVIRONMENTAL ASSESSMENT OF EXISTING LANDFILL

##### 4.1 Environmental Setting and Location

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The Ballymulvey site is located approximately 2 Km north-east of Ballymahon town, and about 0.3 Km south-east of Toome Cross Roads on the N55 between Ballymahon and Edgeworthstown. The site is adjacent to a minor road between Toome Bridge and Newcastle Bridge; this road forming the north-eastern boundary of the site.

The landfill site itself is located in an area of cutaway bog with some former sand and gravel workings to the north-west. An accumulation of silt from the washing of the sand and gravel occupies the area immediately to the north-west of the landfill.

The general area is low-lying, and the landfill site is situated within an area of cutaway bog, forested areas and good quality farmland. The site is approximately 1.0 Km from the River Inny, into which flow the drains and streams carrying run-off from the site.

##### 4.2 Geology and Hydro-geological Conditions

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Ballymulvey lies in a region underlain by carboniferous limestone and other closely related rocks. There are no outcrops, and the bedrock surface is covered, (as in most areas of the Irish midlands), by layers of glacial deposits including tills (boulder clay) and outwash sediments (sands and gravels), and by more recent peat deposits. In general, both the limestone bedrock and the overlying sediments must be considered as permeable, even though there may exist specific regions of low permeability.

More detailed information on the geology and local hydrogeological conditions is very sparse, and it appears likely that no geological or other survey was undertaken before the site was selected as a landfill. This would be common practice among County Councils in the early 1970s, most sites being chosen on the basis of accessibility or cheaply available land. Even in the 1980s, Local Authorities rarely gave adequate consideration to environmental impacts when selecting a site.

In a paper presented at the sixth annual seminar of the International Association of Hydrogeologists (Irish Group), held at Portlaoise in 1986, Donal Daly of the Geological Survey of Ireland is extremely critical of what he describes as "the present emphasis of local authorities on looking for "holes" or quarries to fill in".

During the process of discovery, no site survey or assessment of geological or hydrogeological conditions was produced by Longford County Council. The first documentary evidence of sub-surface conditions was obtained by a brief drilling programme undertaken on 29 July 1992 by Mr Stephen Peel on behalf of the Ballymahon Environmental Action Group.

Drilling was carried out by a lightweight percussion drill with limited depth penetration ability. Five holes were drilled around the site to depths ranging from 3.7 to 7.2 metres, reaching a coarse-grained sandy silt or silty gravel in all cases. The drilling logs also indicated peat deposits varying in thickness from 4 metres to nothing. Most of the sub-surface materials encountered were very soft or loose, and saturated with water. In only one hole was unsaturated material found, and this hole was at a higher elevation and close to a drainage ditch.

Stephen Peel concluded in his report that the area occupied by the tiphead was subjected to high-energy glacial activity in which much coarse and unsorted carboniferous limestone debris was deposited. A finer silty material was deposited over the coarse-grained gravel, and this in turn was overlain by peat deposits.

The presence of silt and clay layers underlying the site would suggest that it is relatively impermeable, but Stephen Peel's report shows that in places these layers may be very thin or absent. The amount of earthmoving undertaken on the site, especially on very soft ground with poor load-bearing capacity, could also lead to disruption of these layers where they are thin.

The site must therefore be considered permeable to some degree, allowing leachate (see section 4.3 below) to penetrate the coarse silty gravels and to contaminate groundwater. At the same time, most of the leachate will flow laterally to contaminate surface water (see section 4.3.3). A site of this type, with uncertain vertical containment and no lateral containment, must be considered unsuitable for the safe reception and storage of wastes.

### 4.3 Water Quality and Related Issues at Ballymulvey

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One of the most significant environmental consequences of the landfilling of wastes is the production of large quantities of leachate -- a highly polluting and noxious liquid generated by the interaction between the waste and rainfall or surface water. Leachate is much more polluting than untreated sewage, and also contains dissolved metals, ammonia and hazardous organic chemicals which persist in the environment.

Leachate can therefore cause serious pollution of surface and groundwaters, and modern landfill practice is to contain and treat it, either on site or at a nearby wastewater treatment plant. Waste disposal sites which allow slow migration and attenuation of leachate are permissible, provided that they are underlain by a thick unsaturated zone of low permeability material, e.g. boulder clay, and that constant monitoring of groundwater and surface water is carried out.

In the case of Ballymulvey, not only are the geological conditions unsuitable (as noted in section 4.2 above), but it appears that the local authority has not undertaken any monitoring of surface or groundwater. The only information on water quality is that provided by the Electricity Supply Board (described in section 4.3.1 below) and by Eolas (described in section 4.3.2 below). Both reports show evidence of significant local water pollution (see section 4.3.3).

#### 4.3.1 Analysis of Water Samples by ESB

Nine water samples were collected on 6 April 1992 by Mr John Fallon, a Pollution Officer with the ESB, and analysed on 7 April for a range of constituents. The sample locations are given in Table 1 and the results are summarised in Table 2.

Samples 4, 5, 6 and 9 were classified by the ESB as a polluting or deleterious effluent which contains deleterious and polluting matter as defined by the Fisheries Acts 1959/1987 and the Local Government (Water Pollution) Act 1977. Samples 1 and 3 were classified by the ESB as polluted water, and samples 7 and 8 as lightly polluted water, under the definitions in the same Acts.

In all samples except those numbered 2, 7 and 8, the Biochemical Oxygen Demand (BOD), ammonia and phosphate levels were exceptionally high, and considerably above that which would be tolerated by a viable and diverse community of living organisms.



SAMPLE No	LOCATION
1	Stream sample from drain adjacent to dump
2	Sample from stream flowing into drain
3	Sample from drain on south-west perimeter
4	Sample from edge of flooded area of dump
5	Sample from edge of flooded area of dump
6	Sample from edge of flooded area of dump
7	Sample from watercourse adjacent to dump
8	Sample from watercourse adjacent to dump
9	Sample from leachate lagoon near tip face

TABLE 1: LOCATIONS OF WATER SAMPLES COLLECTED AND ANALYSED BY THE ELECTRICITY SUPPLY BOARD IN THE VICINITY OF THE BALLYMULVEY LANDFILL SITE

Sample No	PARAMETER MEASURED -- RESULTS (in mg/litre)					
	BOD	S. Solids	Ammonia	Nitrite	Nitrate	O-phos.
1	168	154	197	<0.001	0.223	1.961
2	1.68	23	0.106	<0.001	2.929	<0.001
3	189	222	223.2	<0.001	<0.001	2.366
4	187	146	152.5	<0.001	<0.001	1.922
5	186	102	232.3	<0.001	<0.001	4.099
6	185	126	226	<0.001	<0.001	3.001
7	8.80	9.0	1.62	<0.001	2.312	<0.001
8	7.2	5.0	0.08	<0.001	0.227	<0.001
9	400	1040	519.46	<0.001	1.763	4.382

TABLE 2: RESULTS FROM ANALYSES OF WATER SAMPLES COLLECTED BY THE ELECTRICITY SUPPLY BOARD IN THE VICINITY OF THE BALLYMULVEY LANDFILL SITE

#### 4.3.2 Analysis of Water Samples by Eolas

Three water samples were collected on 8 April 1992 by Mr Martin Reilly, Head of the Atmospheric Testing Department in Eolas. The locations at which these samples were taken, and the results of the analyses by Water Environment Department of Eolas, are shown in Table 3.

All samples indicated pollution, with the leachate sample having a high BOD and elevated levels of some trace elements.

Sample No	LOCATION	pH	BOD (mg/litre)
1	Leachate from Tiphead	8.1	150
2	From ditch directly opposite discharge	7.8	41
3	100 metres downstream in ditch	7.5	6.0

SELECTED ELEMENTS IN SAMPLE 1	
ELEMENT	Conc in mg/l
Sulphur	16
Phosphorus	6.4
Boron	0.23
Manganese	0.41
Magnesium	23
Strontium	0.21
Sodium	80
Potassium	100
Calcium	96

TABLE 3 : SAMPLING LOCATIONS AND RESULTS FROM ANALYSES OF WATER SAMPLES COLLECTED BY EOLAS IN THE VICINITY OF THE BALLYMULVEY LANDFILL SITE

#### 4.3.3 General Comments on Water Quality and on Control of Surface Water Pollution from the Landfill Site

Both sets of analytical results are consistent in that they reveal contamination of local surface waters by leachate, and that this contamination extends along a drainage stream as far as its confluence with the River Inny. The extent to which the River Inny is polluted is not clear.

As mentioned briefly in section 4.3 above, leachate is produced by the percolation of water through landfilled waste and by the dissolution of organic and inorganic substances from the waste materials. Physical, chemical and micro-biological

processes are involved, and under certain conditions partial degradation products of the wastes will become dissolved and transported in the leachate. Some of these products are toxic and highly odorous (e.g. amino acids, fatty acids, amines and ammonia); others contribute to eutrophication or enrichment of the waters which they contaminate (e.g. nitrites, nitrates and phosphorus compounds).

Results of analyses of some typical leachates are given in Table 4.

PARAMETER	LEACHATE FROM RECENT WASTES	LEACHATE FROM AGED WASTES
COD	23,800	1,160
BOD	11,900	260
Total Organic Carbon	8,000	465
Fatty Acids (as C)	5,688	5
Ammoniacal Nitrogen	790	370
Ortho-phosphate	0.73	1.4
Chloride	1,315	2,080
Sodium	960	1,300
Magnesium	252	185
Potassium	780	590
Calcium	1,820	250
Manganese	27	2.1
Iron	540	23
Nickel	0.6	0.1
Copper	0.12	0.3
Zinc	21.5	0.4
Lead	8.4	0.14

TABLE 4 : TYPICAL COMPOSITION OF LEACHATE FROM RECENT AND AGED DOMESTIC WASTES (All results in mg/litre)  
 From: Waste Management Paper, No 26, Department of the Environment, London; quoted in the Technical Memorandum on Management and Operation of Landfill Sites, Dept. of the Environment, Dublin.

Leachate contains much higher concentrations of Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and ammonia than raw sewage, together with high numbers of pathogenic micro-organisms derived from the breakdown of organic and putrescible materials; these may include additional disease-producing species if abattoir or meat wastes are dumped. Modern domestic and municipal wastes also contain small quantities of hazardous materials which are impossible to eliminate at source, e.g., from batteries, fluorescent light fittings and other minor household items; and these substances will appear in the leachate.

Leachates have a high polluting potential, particularly those from newly-placed wastes. High oxygen demand and inorganic solutions of metals in a reduced state of oxidation will lower the oxygen content of receiving waters. Metals and non-biodegradable organics will persist in the environment and, if assimilated into food chains, will adversely affect aquatic organisms including fish.

The high ammonia levels found in leachate are particularly detrimental to fish which are sensitive to low levels of ammonia. If discharge to a river is being considered, the leachate must be diluted many times; and even then it is undesirable as the ammonia, oxidised to nitrite and then to nitrate, will cause eutrophication and excessive growths of aquatic plants.

Leachate from aged sites has been shown to contain a high proportion of organic compounds which are resistant to further degradation. If these compounds contaminate waters from which drinking water is abstracted, chlorination of the water supply can convert them to organochlorines which cause tainting of the water.

If leachate enters groundwater, contamination will persist for a very long time as a consequence of the low dispersion rates and low oxygen levels normally found in groundwater. Thus, groundwater may take many years to recover to a point where it can be used as a source of water supply.

For these reasons, control of leachate is considered essential in modern landfill practice. This is achieved by:

- i) water management;
- ii) containment of the leachate; and
- iii) treatment of the leachate before disposal.

#### 4.3.4 Water Management

Water management begins with the selection of a site which is well drained and which possesses sufficient amounts of impermeable materials for lining, capping and bunding, e.g. fine clay or marl. Water can enter a landfill site by five main routes, and all of these must be controlled:

- i) rainfall;
- ii) ingress of surface water;
- iii) ingress of groundwater through springs or from the presence of a high water table; and
- iv) disposal of liquid or semi-liquid wastes.

The entry of rainfall to the waste can be reduced by operating a cellular system, by compacting the waste properly and covering it with a suitable inert material daily, by keeping cells small, and thereby filling and completing them quickly, and by capping cells with an impermeable material as soon as possible after completion. Capped cells should be contoured so as to shed water, and should be planted with vegetation to encourage evapo-transpiration.

At Ballymulvey no attempt has been made to control the entry of rainfall; all water falling on the site is retained within the bunds for some period of time during which it comes into contact with refuse and is transformed into leachate.

According to the recent report by Malachi Cullen and Partners on the Management and Operation of the Ballymahon Landfill Site (May 1992), the cell system has been only nominally adopted, and is applied only when an area is selected for covering. The refuse is also poorly compacted, and the deposited waste is covered only once per annum.

The entry of surface water to a landfill site can be controlled by diverting streams, digging cut-off ditches and constructing impervious bunds. At Ballymulvey, the water table within the bunded area appears to be higher than that outside and therefore the entry of surface water is unlikely to be a problem.

The entry of groundwater to a landfill site is more difficult to control, especially in low-lying or bog sites. In some cases, sites may have to be sealed against groundwater, or drains laid beneath the site (before tipping begins) from which groundwater can be pumped so as to reduce the water table and provide dry tipping areas. Sites which have become

saturated with water possess a further disadvantage in that oxygen levels fall, the waste mass becomes anaerobic, biological degradation of organic materials is slowed, and noxious compounds are produced.

The Ballymulvey site possesses significant disadvantages for the control of groundwater entry:

- i) it is low-lying and situated on boggy ground;
- ii) nothing is known about possible springs beneath the refuse;
- iii) it is not possible at this stage in the life of the site to lay pumped drains beneath it; and
- iv) the entire mass of the refuse appears to be saturated with water.

In a site without adequate containment or control of leachate it is essential to limit the quantities of liquid and semi-liquid wastes accepted. Yet at Ballymulvey, it is understood that sludge from sewage works and paunch contents from abattoirs are regularly dumped. According to the recent report by Malachi Cullen and Partners on the Management and Operation of the Ballymahon Landfill Site (May 1992), sludge from the County Council's sewerage and water treatment plants is disposed of on the site by lagooning.

The volume of sludges landfilled at Ballymulvey is not known, but some estimate can be made from figures in Longford County Council's Waste Disposal Plan (1988). Section 3.1.5.6 of the plan states that water and sewerage treatment plants produce 3,500 cubic metres of sludge annually and that, since it is difficult to find land on which to spread it, the sludges are usually brought to tipsites for disposal. None of these sludges are de-watered, and therefore they have a very low solids content. The plan also notes that the volume of sludge produced by sewage treatment plants will increase (section 3.1), and that disposal of these volumes will become a problem in the future (section 4.4).

#### 4.3.5 Containment of Leachate

As mentioned earlier, modern landfill practice is to contain leachate and to treat it, either on site or at a nearby wastewater treatment plant. According to the degree of containment achieved, landfill sites can be classified as:

- i) Containment sites;
- ii) Sites allowing slow migration of leachate;
- iii) Sites allowing rapid migration of leachate; and
- iv) Bog sites.

### Containment Sites

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Containment sites are designed to prevent the escape of any leachate and must either be situated on impermeable rocks, on fine grained materials such as clay or marl, or on an artificially sealed base composed of, e.g., soil cement, asphalt, puddled clay, plastic or butyl rubber.

A containment site should not be considered as an environmentally acceptable option unless the impermeability of the substrate can be guaranteed over a long time period, nor should it be located in an area of high rainfall without some method of preventing penetration of surface water. Otherwise the waste may become saturated, resulting in a wet condition leading to anaerobic degradation of the tipped material. It is also important not to add excessive quantities of liquid waste to containment sites.

Wet conditions in a containment site may cause, if further saturation is allowed to continue, the site to fill with leachate which will eventually overspill the sides of the site and pollute adjacent areas.

At Ballymulvey, the impermeability of the substrate cannot be guaranteed, and the saturated conditions observed will very soon lead to further contamination of adjacent watercourses by leachate.

### Sites Allowing Slow Migration of Leachate

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Sites allowing slow migration of leachate may be environmentally acceptable in or above geological formations in which groundwater movement takes place largely by intergranular flow. The presence of an unsaturated zone beneath the site is also essential in order to delay the movement of leachate



from the waste downwards to the water table. This delay is necessary for attenuation of the leachate, principally by the mechanisms of dispersion and diffusion, by chemical reactions and by aerobic degradation which can take place only in the unsaturated zone.

In Ireland, the only suitable geological formations in which such sites may be located are the Quaternary gravels, sands, silts and sandy tills. Sites with a thick unsaturated zone beneath them are not common as a consequence of the generally high water table due to high rainfall, low relief and poor drainage. Investigations of sites with a shallow or thin unsaturated zone, i.e., where the water level is at or close to the base of the site, have shown that pollution of ground-water aquifers will readily occur.

The correct operation of sites allowing slow migration of leachate also requires that the amounts of liquid waste added to the site should be strictly controlled, and that toxic or tainting non-biodegradable soluble substances should not be present in the refuse dumped.

#### Sites Allowing Rapid Migration of Leachate

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Sites allowing rapid migration of leachate are unsuitable for any wastes which produce a noxious leachate, and should therefore receive only inert wastes (construction or demolition wastes such as soil, rubble, bricks or rock).

#### Bog Sites

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Sites on either unexploited virgin bogs or on cut-away bogs have been considered an attractive waste disposal option by many County Councils, particularly as the land may usually be bought cheaply. Care should be taken to distinguish between the hydrological characteristics of the different types of bog site.

Untouched raised bogs are of low permeability but cannot be considered as containment sites since they drain into rivers and may be underlain by aquifers which could be contaminated by leachate from the landfill. They may be more appropriately considered as sites allowing slow leachate migration, with very little or no unsaturated zone. Therefore aerobic degrad-

ation is unlikely to persist for long. Anaerobic degradation of the landfilled organic matter will quickly follow, leading to the production of methane gas.

On these bog sites the peat may constitute a fire hazard, particularly if dried out by drainage, and there will usually be a scarcity of clay suitable for the construction of bunds or for providing impermeable cover material.

Cut-away bogs, or the damaged fringes of raised bogs, allow a considerable amount of water movement since the disturbed peat is no longer of low permeability. The permeability of the underlying sediments (gravel, sand, clay or a mixture of these) and bedrock will determine to a major extent whether the site may be considered as allowing slow or rapid migration of the leachate.

The generally high water table and absence of an unsaturated zone create difficulties in ensuring that groundwater is adequately protected. In order to ensure such protection, these sites require, as a minimum:

- i) the installation of a drainage system before development of the site;
- ii) collection and treatment of the leachate by chemical and/or biological processes;
- iii) impermeable capping of the completed portions of the landfill surface in order to minimise penetration by rainfall; and
- iv) adequate monitoring of surface water and groundwater quality in the vicinity.

Ballymulvey is a bog site (Longford County Council Waste Disposal Plan, 1988, section 3.4.1.1) but clearly cannot be regarded as a containment site. It possesses all of the disadvantages of a bog site noted above, and none of the requirements to ensure adequate protection of surface or groundwater have so far been met.

#### 4.3.6 Treatment and Disposal of Leachate

Treatment and disposal options for leachate include tankering or discharge to a sewer or sewage treatment plant, treatment on site, or spraying on suitable land areas. In all cases, leachate must be collected and held in a balance tank

(storage within the waste or, less desirably, in a lagoon may be used) in order to smooth out fluctuations in leachate volume and to reduce peak loads.

If treated at a sewage treatment plant, leachate flow should not exceed 5 % of the total load entering the treatment plant, shock loading should be avoided, and there may be a need to pre-treat or otherwise eliminate heavy metals, toxic organics or other substances which would detrimentally affect biological treatment systems.

On-site treatment systems can also be used to deal with leachate; these include partial treatment by recirculation of leachate through the deposited waste, and full treatment in an on-site plant.

Spreading of leachate on existing areas of landfill provides the following advantages:

- a) it reduces the time required for the waste to produce a more stabilised leachate;
- b) it reduces the volume and strength of leachate to be treated; and
- c) trace amounts of heavy metals and pesticides may be adsorbed by the waste.

Spreading and recirculation does not provide adequate treatment of leachate because of the following problems:

- a) the landfill may become more anaerobic as the waste mass is saturated, leading to increased production of landfill gas (methane);
- b) in areas of relatively high rainfall (and this includes most parts of Ireland) the waste will have no capacity to absorb the leachate;
- c) surface ponding may be caused if the leachate is spread at too high a rate, especially on refuse which is already wet;
- d) leachate percolating downwards through an elevated site may "break out" laterally if it encounters a less permeable layer.

After recirculation through the landfill, the leachate will still require treatment; if this is carried out on site a biological and/or chemical treatment plant will be required. Reference has already been made to the difficulty of treating leachate when mixed with sewage; on its own, leachate is even

more difficult to treat because of the relatively high levels of metals, less easily degradable organics, ammonia, chloride and sulphides. If the leachate is deficient in phosphates, they will have to be added. Furthermore, conventional aerobic systems for the treatment of leachate require extended retention times (often up to fifteen days) to be effective.

Spray irrigation of adjacent land areas with leachate as a method of disposal is not generally used because of the following difficulties:

- a) spraying over land used for grazing or production of edible crops is not recommended because of the likely transmission of diseases and build-up in the soil of persistent toxins, e.g., metals;
- b) run-off from the soil surface in wet weather would lead to pollution of watercourses;
- c) in most parts of Ireland, the soil moisture content is too high for approximately six months of the year, and the leachate would not be absorbed;
- d) farmers would be unlikely to accept leachate, and it would have to be spread on other lands, e.g., those owned by the local authority.

The nature and location of the site at Ballymulvey creates the following very severe difficulties in the treatment and/or disposal of leachate:

- i) there is no sewage treatment plant nearby to which the leachate could be pumped or transported by road tanker for treatment;
- ii) the principal sewerage systems in County Longford are overloaded (Waste Disposal Plan, 1988), and it will be some years before new or expanded facilities can be provided;
- iii) the existing areas of the landfill are unsuitable for spreading and recirculation of leachate because they are already saturated with water, the site is low-lying, and it is located in an area of relatively heavy rainfall;
- iv) there is a danger that if leachate is sprayed on the elevated portion of the site (cell 3), it may escape through the bund, and containment would be lost;
- v) a dedicated treatment plant on site would be too costly, and would require continual maintenance;

- vi) there is no suitable land in the vicinity on which leachate could be spread, and it is likely that it would not be acceptable to farmers.

#### 4.3.7 Conclusions Regarding Water Management and Control of Leachate

The observations and information given above compel us to conclude that:

1. There is no control over the types of material (municipal, commercial and other miscellaneous wastes) accepted at the landfill site;
2. These wastes are giving rise to a highly contaminating and polluting leachate;
3. There is no attempt to control surface water penetration into the landfill;
4. Leachate from the landfill is contaminating nearby drains and streams which flow to the River Inny;
5. The bunds constructed of silt and refuse will not in themselves prevent the escape of leachate from the site; if the site is relatively impermeable the accumulated leachate will, if not removed, e.g., by pumping, overtop the bunds and contaminate nearby drainage ditches and streams;
6. Because of the relatively permeable nature of the underlying peat and coarse glacial deposits, it is highly likely that groundwater is also becoming contaminated;
7. The location and nature of the site create severe difficulties in the collection and adequate treatment of leachate; and
8. No sewage treatment plant in the County appears to have the necessary spare capacity to accept and treat the leachate.

#### 4.4 Windblown Litter

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Paper, plastic and other windblown litter have previously created problems in and around the Ballymulvey site. At the time of our site visit, quantities of windblown litter could be seen around the site and on the adjacent bogland. As well as its unsightly nature, windblown litter is a danger to farm animals and wildlife, and may contribute to the spread of disease organisms from the landfill.

The chain-link fencing under construction by Longford County Council will not be adequate to control windblown litter. This type of fence is able to hold plastic or paper only for short periods of time, after which the refuse becomes shredded by the wind and escapes to contaminate adjacent lands. Furthermore, the elevated area on which refuse was being spread (cell 3) is particularly exposed to winds, making containment very difficult to achieve.

#### 4.5 Air Pollution

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Unpleasant odours, dust, methane gas from anaerobic decomposition of refuse, and smoke/gases from uncontrolled fires are the principal types of air pollution from landfill sites. During our site visit, a strong unpleasant odour, typical of municipal landfill operations, was noted in and around the Ballymulvey site. It is understood that local residents have also complained frequently of odours from the site.

No fires were visible on site during our visit but, according to local residents, fires have been frequent in the past. Such fires may start spontaneously from the heating up of buried refuse, and are assisted by the presence of landfill gas (methane). It is also our experience that on many open landfill sites (where access is not strictly controlled) members of travelling families set portions of the landfill on fire in order to burn off combustible material. Metal scrap such as electrical wiring, pieces of copper pipe, etc, are then exposed to view and are more easily removed.

These fires generate considerable quantities of smoke and, since plastics are burned in them at a relatively low temperature, it is certain that polychlorinated biphenyls (PCBs), dioxins and other toxic volatiles are emitted to the atmosphere. Such fires are not only a source of pollution but are a significant health hazard to the travellers scavenging the landfill and, to a lesser extent, to site workers and local residents.

#### 4.6 Deterioration in the Visual Quality of the Landscape

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The presence of a municipal and industrial waste disposal site can rarely be said to enhance the visual quality of landscape, but it is often possible to minimise adverse impacts by careful planning, siting, screening, and control of windblown litter and indiscriminate dumping. Such good practices are essential where landfill sites are located close to tourist routes or areas of recognised landscape value. The relative isolation of the Ballymulvey site and its location on cutaway bog appears to have resulted in Longford County Council failing to give sufficient attention to these matters.

During our site visit on 1 September it was not difficult to observe that the landfill operation has resulted in a noticeable reduction in the visual and landscape quality of the area. Owing to the nature of the site, and particularly to the height to which the refuse has been deposited, screening by trees or other means is difficult.

Some screening is provided by trees west of the site, i.e., towards Toome Cross, but the elevated refuse in cell 3 is visible over a wide area of countryside to the north.

#### 4.7 Vermin, Birds, and the Possibility of Increased Risk of Disease Transmission to Animals and People

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As noted in section three above, a large flock of birds was seen on the site during our visit on 1 September. Local residents have frequently complained of seagulls and other birds frequenting the landfill site, and removing edible refuse which may subsequently be discarded on nearby farmland. Such refuse has in the recent past included parts of carcasses, animal bones and pieces of meat, possibly originating in butcher shops or abattoir premises.

The number of rats attracted to the site, and possibly breeding there, also appears exceptionally high from the records of rodent control treatments carried out by Rentokil on behalf of Longford County Council. According to a letter dated 14 July 1992 from Rentokil to Longford County Council, rodent control was carried out five times during 1991 and four times in the first six months of 1992; on each visit

signs of rodent activity were noticed in the surroundings of the dumping area. The need for such frequent control of rodents is an indication that, in the absence of daily covering of refuse, rats will continue to be prolific on the site.

The continuous or frequent presence of uncovered sludges, putrescible and animal wastes, together with warmth from the decomposition of these organic materials, is likely to give rise to large numbers of flies. These may not only constitute a significant nuisance, but are potential carriers of pathogens to nearby houses, farm and domestic animals and land.

It must be concluded that vermin attracted to and feeding from the landfill create a significant health risk to farm and domestic animals and local residents.

#### 4.8 The Presence of Asbestos on the Site

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As noted in section 1.2 above, asbestos waste from the ESB electricity generating station at Lanesboro was buried by Capco Limited at the Ballymulvey site between 22 and 27 July 1987. Permission for the burial of this waste was given by Longford County Council earlier that month, yet it is understood that the burial was subsequently denied by officers of the Council.

The quantity of asbestos waste buried in the site is not known with accuracy, but is likely to be in the region of 30 or 40 tonnes, or 2.5 container loads (extracts from diary of Mr Cormac Daly, dated 29 June and 27 July 1987). Examination of the correspondence between Capco and the ESB suggests that around 5,000 bags of asbestos-contaminated waste were removed for disposal, of which 2920 bags were removed from the boiler top and the remainder from pipework.

The bagged asbestos waste appears to have been buried in refuse in a layer 2 metres deep, covered with less than 1 metre of sand, and slightly over 1 metre of refuse. The location of the burial site is sketched roughly in the diary of Mr Cormac Daly, but apart from that brief description, no other record appears to have been kept by the County Council.

No details of precautions taken (if any) during the burial operation are available, though the records of Capco indicate that the material was double-bagged as requested by the County Council in their letter of 8 July 1987.



#### 4.8.1 Health Effects of Asbestos

The first recorded diagnosis of asbestosis was in a textile mill worker who died in 1907 at the age of 33. The first suspicions of a link between asbestosis and lung cancer came in 1935 from a study of asbestos textile workers in South Carolina, U.S.A., but the association was not generally accepted until the 1950s.

As with most of the dust-induced chest diseases, there is a long latent interval between cause and effect. Asbestosis may develop after two or three years in particularly heavy exposure, or it may take 20 years; cancer of the lung up to 30 years after first exposure, and mesothelioma as long as 40 or more years later. Total immunity to any harmful effects among asbestos workers is rare.

Entry of asbestos fibres to the human body is via two pathways: the respiratory tract and the digestive tract. Contamination of the skin may give rise to formation of asbestos warts, but this does not lead to the uptake of asbestos in the body.

Uptake of airborne materials through the respiratory tract is normally controlled by defence mechanisms which prevent the penetration of dust particles to the lungs. These mechanisms work very efficiently for particles  $> 5$  microns. For smaller dimensions, the efficiency decreases rapidly, while for the smallest particles the mechanism has no effect, resulting in deposition in the lung alveoli.

Asbestos fibres split up easily into numerous fibres of relatively great length and very small diameter. Studies in the 1960s and 1970s (Timbrell, 1973) showed that the passage of asbestos fibres through the airways to the lung alveoli was related only to fibre diameter; the upper limit of this diameter is 3 microns. Fibre length does not appear to be significant in determining the degree of uptake, but fibre lengths  $> 200$  microns lead to more efficient activity of the defence mechanisms.

The uptake of asbestos fibres through the digestive tract can occur both directly and indirectly:

- i) Direct uptake of asbestos fibres by persons exposed to the substance takes place by ingestion through the mouth. This happens in eating and drinking, in smoking in asbestos-contaminated ambient air and in swallowing asbestos fibres trapped in the nose and mouth from contaminated respiratory air.

- ii) Indirect uptake occurs via sputum, produced in the normal physiological processes from the lungs and lower respiratory tract, being swallowed regularly. After exposure to asbestos-containing ambient air a multitude of asbestos fibres will be found in the sputum, either as fibres or as asbestos bodies. In this way asbestos fibres may be found afterwards in various organs.

While the harmful effects of swallowed asbestos have not been fully determined, it is known that ingested fibres can be found in various organs, such as the spleen, liver, kidneys, lungs, brains, lymph nodes and blood. Studies to date have involved only potential exposures of up to 15 years; given the long incubation period of many serious illnesses it is too early to declare asbestos contamination of water to be "harmless".

The most common asbestos-related diseases are asbestosis and mesothelioma. Mesothelioma (tumour of the pleura and peritoneum) may occur after a very long latency period and, according to many health scientists including an EC Working Group of Experts, constitutes the main risk to public health.

The majority of studies, including the USA Enterline (1973) study of asbestos industry workers and the Report of the Advisory Committee on Asbestos Cancers (IARC 1973), agree that crocidolite is more carcinogenic than chrysotile or amosite. In reviews of the relationship between respiratory exposure and mesothelioma, crocidolite appears to provide the greatest risk.

According to Margaret Hamilton, MBE, MIOSH (HON), in the Industrial Data File of 1984: "The realistic view, now generally acknowledged, is that with carcinogens such as asbestos no concentration of dust, however small, can confidently be pronounced as without any risk."

#### 4.8.2 Development of Statutory and International Controls

One of the earliest attempts at statutory control took place in the U.K. with the Asbestos Industry Regulations 1931, which were later replaced by the Asbestos Regulations 1969. This legislation has been further tightened by the Asbestos Licensing Regulations 1983.

As a result of the expansion of medical knowledge about the hazards of asbestos, increasingly stringent regulations were developed in many countries controlling dust exposure levels for both workers and the general public.

The 1977 European Communities Programme of Action on the Environment drew up a list of pollutants for priority investigation. Pollutants, including asbestos, were chosen on the grounds of their toxicity and the current state of knowledge of their significance in the health and ecological fields.

On 19 March 1987 the European Community adopted a Directive on the prevention and reduction of environmental by asbestos (87/217/EEC). This Directive obliges all member states to take whatever measures are necessary to ensure that:

- i) in the course of the transport and deposition of waste containing asbestos fibres or dust, no such fibres or dust are released into the air and no liquids which may contain asbestos fibres are spilled;
- ii) where waste containing asbest fibres or dust is landfilled at sites licensed for the purpose, such waste is so treated, packaged or covered, with account being taken of local conditions, that the release of asbestos particles into the environment is prevented.

In Ireland, exposure to asbestos is controlled under the Factories (Asbestos Processes) Regulations 1975 (S.I. 238 of 1975).

#### 4.8.3 Assessment of Site Suitability for the Reception and Storage of Asbestos-contaminated Wastes

The well-known dangers to human health (see 4.8.1 above) from the inhalation of asbestos fibres in air and, to a lesser known extent, from the ingestion of asbestos fibres in drinking water, have led to the development of stringent precautions for the handling and disposal of asbestos-contaminated wastes. Asbestos wastes may be safely accepted and stored in landfill sites along with other wastes, but it is essential for human and environmental safety that the site should possess the following minimum characteristics or criteria:

- i) adequate vehicular access;
- ii) availability of soft or "virgin" soil, or similar material to cover the waste immediately after deposition;

- iii) availability of a water supply to wash containers which may have become damaged or broken;
- iv) remoteness from water courses and above groundwater level at all times;
- v) the drainage characteristics should be such that no possible wash-out of asbestos fibres is likely to take place which could pollute a nearby watercourse or which could dry out to create an air pollution or environmental hazard;
- vi) absence of dwellings, schools or other sensitive facilities in the neighbourhood or vicinity of the site;
- vii) absence of combustible materials in the vicinity of the asbestos waste disposal area, and total control over fires within or on the landfill;
- viii) absence of scrap metal or other sharp objects which could cause puncturing or damage to the bags within the asbestos waste disposal area;
- ix) absence of any reactive chemicals within the landfill which could degrade or attack the surface of the plastic bags over a long period of time, resulting in possible release of asbestos fibres;
- x) detailed records of the types, location and quantities of other wastes previously deposited or currently being deposited in the landfill site;
- xi) adequate separation between asbestos and other wastes; and
- xii) freedom from possible site disturbance over a long time period.

Essential precautions and good practices to ensure environmentally safe disposal and long-term storage of the asbestos wastes include:

- a) the waste should not be deposited at the foot of the working face of the landfill, but should be placed in a discrete and well-marked area away from the working face;
- b) asbestos waste should not be deposited directly into refuse, but should be separated from the refuse by a barrier of e.g., sand, concrete, layers of heavy plastic, etc;

- c) asbestos waste should not be deposited into water nor within 2 metres of the edge or final surface of waste in the site;
- d) detailed records should be kept of the exact amounts and locations of waste deposited;
- e) trained staff should be on hand at all times when waste is being received, unloaded and deposited;
- f) the landfill site must be well-managed to a high standard (for example, none of the management deficiencies listed in section 4.3.7 above should be allowed); and
- g) the landfill site must have adequate facilities for the provision, storage and maintenance of safety equipment and protective clothing, and for vehicle cleaning and personal hygiene.

The intrinsic nature of the landfill site at Ballymulvey, and the manner in which it is currently operated, lead to the conclusion that the above criteria were not satisfied. In fact, the types of waste already on site, the environmental conditions, and the way in which the site is operated create serious obstacles to the secure long-term disposal of the buried asbestos.

Some aspects of the existing site unsuitability and unsatisfactory operational practices have been referred to above (see sections 4.1 to 4.7), but there are additional negative implications when considering the long-term security of the buried asbestos wastes:

- i) No detailed record or site plan exists (apart from the rough sketches in Cormac Daly's diary) giving the position of the asbestos wastes on site; in the absence of detailed site disposal records it will be impossible to identify with accuracy the location of the buried asbestos, particularly if further earthmoving or re-contouring have been carried out in the vicinity since the burial;
- ii) The corrosive properties of wastes already deposited on site could pose a risk to the integrity of the asbestos packaging;
- iii) The poor drainage characteristics of the site, and its saturation with water, render it unsuitable for the long-term storage of asbestos;

- iv) It is not known whether trained people were at hand to supervise the burial of the asbestos waste, and whether all the bags were free of holes after unloading and deposition in the trench;
- v) There are no grounds to believe that the build-up of methane and subsequent risk of gas explosions or fires will be satisfactorily controlled or prevented; and
- vi) The site is not hydrogeologically secure, with the resulting risk that surface waters or groundwater could become contaminated by asbestos.

#### 4.9 Further General Comments on Recent and Existing Landfill ----- Site Management -----

It must be concluded that the Ballymulvey landfill site is at present inadequately managed. Deficiencies in the management of water on site and in the control of leachate are listed in section 4.3.7 above; further deficiencies include:

1. There appears to be no attempt to monitor surface water or groundwater quality, using dedicated boreholes and/or local domestic wells -- this activity should be considered vital in view of the permeable nature of the peat and underlying glacial deposits;
2. Safety and security on site appear to be minimal, there is unrestricted access by members of the public and by young travellers who scavenge for recoverable materials, and it is understood that the caretaker is untrained and has no means of fighting fires or of contacting emergency services;
3. Occasional uncontrolled fires on the landfill site cause the emission of toxic air pollutants and nuisance by smoke and smells;
4. The presence of the sludge-filled lagoon, including those parts of it which have been back-filled or re-covered with unconsolidated refuse, is a significant hazard to anyone walking on the site;

5. The landfill site is not yet operated in accordance with generally-accepted good operating principles which would include tipping in cells separated by bunds of clay (only one cell is open or in use at any one time), compacting and covering the refuse with soil or other suitable material after each day's tipping, and covering each completed or fully filled cell by a contoured impermeable cap from which surface water can drain to an interceptor ditch; the cellular system has been only nominally adopted on site;
6. There is inadequate control of wind-blown litter, and vermin, particularly rats and birds, have not been fully controlled or prevented from gaining access to the refuse; and
7. The burial of asbestos waste on the site appears to have been carried out in an irresponsible manner, in ignorance of the generally accepted precautions to be taken when depositing this waste, and with little regard for the longer term security of the material.

## 5.0 POSSIBILITIES FOR AMELIORATION OF ADVERSE IMPACTS

The possibility of ameliorating the existing adverse environmental impacts caused by the site has also been examined by us, though not comprehensively. Clearly, there is much that can be done, and a number of improvements have already been made as recommended in the report of 4 May 1992 by Malachi Cullen & Partners.

If the site is to be kept in operation, further essential improvements should include:

- i) Complete fencing of the landfill site in such a manner that the fence exceeds the maximum height of the landfill surface by at least 3 metres in all places;
- ii) provision of a secure controlled entrance in order to prevent unauthorised access at all times;

- iii) identification and control of all wastes arriving on site;
- iv) elimination of the practice of letting leachate accumulate in a lagoon on the site;
- v) imposition of strict control over the quantities of liquid wastes accepted at the site, so as to reduce the rate of infiltration and leachate production;
- vi) operation of the landfill site on the "cell" system with only one cell being "open" or active at any one time, and compaction and covering of the refuse with soil or other suitable material after each day's tipping;
- vii) capping and grading of each completed cell surface with clay or other suitable impermeable material so as to prevent the penetration of surface water into the landfilled refuse;
- viii) installation of a drainage system beneath the waste mass to recover, contain and treat leachate from the landfill;
- ix) installation of a methane gas venting or recovery system;
- x) control and elimination of on-site fires, including training of site personnel in fire fighting and the provision of appropriate fire-fighting equipment;
- xi) site personnel to receive training in identifying and dealing with suspect or unacceptable wastes, with clear instructions regarding refusal;
- xii) implementation of an extensive landscaping programme around the site, with the aim of restoring visual and environmental amenity as far as may be achievable;
- xiii) implementation of a programme to reduce and eventually eliminate vermin from the site;
- xiv) implementation of a comprehensive programme of air and water quality monitoring in and around the site, including the establishment and inspection of dust gauges and regular sampling and analysis of surface and groundwater (from boreholes and local domestic wells); and
- xv) improvement of the surface and margins of the road.



It is acknowledged that, because of the nature of the site some of these ameliorative measures may be extremely costly to implement, and there is no guarantee that they will work. The site must also be viewed in the context of the proposed European Communities Directive on the landfill of waste, the impact of which is discussed in the next section.

## 6.0 THE IMPACT OF THE E.C. DRAFT DIRECTIVE ON THE LANDFILL OF WASTE

A resolution of the European Parliament on 19 June 1987 drew attention to the extent and seriousness of environmental problems associated with waste dumps. As a consequence, the Commission has proposed a detailed directive on the landfilling of wastes to ensure that member states adopt a homogenous policy on landfills, and that standards are harmonised throughout the European Community. The draft Directive (COM (91) 102 final; Brussels, 22 May 1991) is expected to receive approval before the end of 1992.

The Directive will require local authorities and other waste disposal site operators to comply with a wide range of conditions. Landfills which are already in operation at the time of notification of the directive may not continue to operate unless they comply with certain provisions aimed at protecting the environment (Article 15).

These provisions require that the site operator must obtain a permit from the competent authority; and a permit will not be granted unless the future operation of the remaining part of the site meets the conditions laid down in the Directive.

The directive also requires, inter alia, that:

- i) the landfill site must not pose a serious environmental risk to residential and recreation areas, roads and waterways, water bodies, other industrial, agricultural or urban sites, groundwater, nature conservation areas, and items or areas of natural or cultural heritage;
- ii) surface and/or groundwater entering the landfill waste must be controlled;
- iii) all water or leachate emanating from the landfill must be collected and treated to the appropriate standard before discharge;

- iv) a landfill site must meet the necessary conditions, naturally or artificially achieved, to prevent pollution of the soil or groundwater;
- v) the non-saturated geological formations constituting the substratum of the landfill base and sides must satisfy the requirements for permeability and thickness set out in the Directive;
- vi) appropriate measures must be taken in order to control the accumulation and migration of landfill gas which must be collected, properly treated and preferably used;
- vi) measures must be taken to prevent nuisances arising from the landfill through the emission of odours and dust, windblown materials, noise and traffic, birds and vermin, and formation of aerosols.

The nature of the Ballymulvey site is such that complying with the Directive is likely to prove extremely costly and difficult. In fact, it is our understanding that a number of municipalities in E.C. Member States are already undertaking the removal and re-disposal of landfill wastes from existing sites (whose permeability cannot be guaranteed) to more recently constructed impermeable or lined sites in anticipation of the Directive's effects.

## 7.0 OVERALL LANDFILL SITE COSTS

In considering the possibility of upgrading the site so as to ameliorate existing environmental impacts and to comply with the requirements of the E.C. Directive on the Landfill of Waste, particular attention will need to be paid to the capital and operating costs which would be incurred. At an inherently unsuitable site such as Ballymulvey, such measures will add considerably to the operational costs over the remaining life of the site. These costs are more significant than is generally realised, as shown in Table 5.

A small percentage increase in operating costs is therefore likely to amount to more, in the long term, than the acquisition and development of a new site which would be more suitable. Purchase of a new site, followed by rehabilitation and closure of the Ballymulvey site may therefore be a more cost effective solution to the current problems.

BREAKDOWN OF TOTAL LANDFILL SITE COSTS	Actual Unit Costs (£/cu metre)	Actual Percentage of Total	Typical Modern Landfill Costs
Site Assessment	0.018	0.2%	1.0%
Site Acquisition	0.153	1.4%	6.9%
Initial Site Development	0.884	8.2%	8.0%
Phased Development	0.47	4.3%	4.4%
Restoration	0.294	2.7%	2.9%
Aftercare	0.176	1.7%	4.1%
Operational Costs (range £ 7.06 to £ 10.59; average £ 8.82 / cu metre)	8.823	81.5	72.7
Total per cu metre	£ 10.818	100%	100%

TABLE 5 : BREAKDOWN OF TOTAL LANDFILL SITE COSTS, FROM SITE ASSESSMENT AND ACQUISITION TO FINAL CLOSURE AND AFTERCARE (From O'Neill, D., Lucas, J.L., and Johnston, P.O., 1986. The Development of a Modern Landfill Site at Whiteriver, Co Louth. Paper given at the 6th Annual Seminar of the International Association of Hydrogeologists (Irish Group)).

## 8.0 RECOMMENDATIONS

Given the difficult and unsuitable nature of the site, its distance from the principal waste sources in the County, the previous history of waste disposal at the site, the current management problems, the cost of bringing it up to a suitable standard, and the effect on such sites of the proposed EC Directive on the Landfill of Waste, it is essential that, in order to adequately alleviate the current problems, Longford County Council should seriously consider the option of closing and rehabilitating the Ballymulvey landfill site.

A new, more central, location for a waste disposal site would have to be found, but it is likely that a systematic and planned approach would reveal a number of potentially suitable areas which could be assessed in greater detail from engineering and environmental points of view.

If a new site is found, it is essential that the Ballymulvey site is not abandoned, but is properly closed, rehabilitated and given a degree of aftercare. At a minimum, these should include:

- i) complete or partial removal of the visually intrusive high plateau of refuse which constitutes cell 3 -- this should be lowered and contoured to reduce its adverse visual impact;
- ii) contouring of the entire site and covering with an adequate layer of impervious material such as clay or marl so as to shed rainfall and reduce the ingress of water to the waste;
- iii) laying drains within the site so that all leachate is collected to a sump or tank from which it should be removed for treatment (with proper capping, the volume of leachate will decrease over a period of a few years);
- iv) venting of the entire site to ensure the safe release of landfill gas;
- v) removal of the buried asbestos to a safer site, or careful location and examination of the bags to check that their integrity has not been affected -- the choice of whether or not to move the asbestos to be based on whichever option will cause the least environmental and health hazards;

- vi) monitoring of surface water and groundwater within and adjacent to the site until all significant traces of contamination by leachate have ceased;
- vii) ensuring that the site is secure and access is not possible until capping has been completed and the site has been made safe;
- viii) landscaping the perimeter of the site and seeding the domed cap with suitable vegetative cover, e.g., a grass and clover mixture, which will have the effect of further reducing infiltration by rainfall and will improve the appearance of the closed site.

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28 September 1992

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Heads of Agreement

Tue 6 Oct

i) Adequate security of the site as a whole, by means of a fence or wide cut-off drain so as to prevent <sup>unauthorised</sup> access to the tipping <sup>area</sup>, lagoon or other parts of the landfill when the entrance is closed;

ii) agreed as on P31 ii) section 5.0.

iii) to vii) agreed

viii) Leachate <sup>must</sup> be <sup>managed</sup> contained and treated (either on-site or off-site) to an appropriate standard suitable for discharge. If the monitoring programme specified in xiv) should show any evidence or indication that pollutant matter is being discharged to <sup>to</sup> an extent that it ~~is~~ surface or ground-water <sup>is</sup> being caused <sup>by</sup> from the landfill operation; then the

ix) installation of a system to vent or otherwise prevent the build up of methane gas in the landfill mass;

x) - x iii) accepted / agreed

Heads of Agreement, contd p2

- xiv) the comprehensive monitoring programme described in xiv) on p32 to be carried out monthly, initially; and then quarterly if no evidence of significant contamination ~~persists~~; ~~dust gauges to be installed and~~ dust measurements only if there is a reported dust problem; results of all monitoring to be made available to ~~local residents of the~~ ~~the public.~~ ~~the public.~~ ~~representative~~
- xv) agreed.

SITE CLOSURE

Report section 8.0 (p36)

- i) Closure and <sup>on-going</sup> rehabilitation of the site to begin on 1 January 1993, and to be completed ~~by~~ by 1 Jan 1995; final restoration (including capping) to be completed by 1 Jan 1995
- ii) Closure and rehabilitation to be carried out according to a site management, operation and rehabilitation plan <sup>and schedule</sup> which will be prepared by Malachi Cullen and Prockness; ~~the Longford County Council to submit this plan~~ ~~and submitted~~ to the residents for <sup>their</sup> examination and approval by 31 Dec '93

and in this consultation process the input  
and concerns of the residents to be taken  
into account as far as practicable; and  
the County Council will their best  
endeavour to meet the concerns of the  
residents



- (ii) The site rehabilitation plan to provide a clear and detailed, illustrated, account of how the site will, after closure, be integrated into the surrounding landscape; ~~(this to be shown preferably by means of a scale model)~~
- iv) as ii) agreed (p 36);
- v) continuing monitoring of the site on a less frequent basis, declining to annually if no detrimental effects or contamination is evidenced
- vi) all monitoring results to be made available to ~~local residents~~ <sup>and their</sup> representative of <sup>the public</sup> local residents;
- vii) if the monitoring shows any <sup>significant</sup> contamination, the C. Council to take responsibility for <sup>management</sup> ~~control~~ of leachate, for its containment and (if necessary) for its removal and treatment;
- viii) as ix) on p 4 of this doc't.
- ix) ~~careful examination of~~ ~~or investigation~~ of the buried asbestos so as to detect

~~its precise location, condition of the bags  
in which it is contained together with  
any other factors or features which indicate  
its long term safety and stability;~~

~~x) if the asbestos is to be left in situ  
~~or removed~~ the decision being based on  
whichever action will cause the least environ-  
mental and health hazards) to the local  
~~residents~~ then the County Council <sup>will require</sup> to take  
the producer of the waste to take  
full responsibility for ~~it~~ to ~~will~~ indemnify  
against any future adverse effects caused by  
the material; and to take appropriate action;~~

x i) the site of asbestos burial to be clearly  
marked;

x ii) point vii) agreed (p 37)

x iii) point vii) agreed (p 37)

x iv) point viii) agreed (p 37).

J.A.O. Sullivan  
17/1/71

THE HIGH COURT ON CIRCUIT

MIDLAND CIRCUIT

COUNTY OF LONGFORD

BETWEEN

SEVERAL

Plaintiffs

AND

THE COUNTY COUNCIL OF THE COUNTY OF LONGFORD.

Defendants

BEFORE HIS HONOUR MR JUSTICE BLANEY AT LONGFORD  
ON THE 6TH OF OCTOBER, 1992.

The Defendants having appealed the Order of Judge Matthew Deery of the 4th May, 1992 by Notice of Appeal dated the 6th May, 1992 WHEREUPON the same coming on for hearing on this day in the presence of Counsel for the Plaintiffs and Counsel for the Defendants and UPON READING the Consent herein dated the 6th October, 1992 signed by Counsel for the Plaintiffs, Edward Walsh B.L., and Counsel for the Defendants Esmonde Keane B.L., IT IS HEREBY ORDERED that the said Consent be received and filed and be deemed to be part of this Order.

CONSENT

The action is settled on the following terms:-

1. That the Defendants, its servants or agents, as and from the 1st day of January, 1995, be and are hereby enjoined and restrained from using, causing or allowing its property the subject matter of the proceedings herein situate at Ballymulvey, Ballymahon in the County of Longford to be used as a public dump or tiphead.

2. That the Defendants, its servants or agents, as and from the 6th day of October, 1992 shall be permitted to dump at Ballymulvey, Ballymahon in the County of Longford non-toxic domestic waste, non toxic commercial waste and non toxic industrial waste only and shall not be permitted to dispose at the dump or landfill site, offal, farm waste, dead animals or parts thereof, asbestos, oils, lubricants, toxic wastes or any sewage in liquid form.
3. That the Defendants, its servants or agents carry out amelioration works in accordance with Schedule A annexed hereto which works are to commence immediately and to be completed not later than the 1st January, 1995.
4. That the Defendants, its servants or agents carry out rehabilitation works in accordance with Schedule B annexed hereto which works are to commence immediately and to be completed not later than the 1st January, 1998.
5. That the Defendants do pay the Plaintiffs' costs of the Circuit Court and the High Court together with the costs of all ancilliary Orders in all cases as set out in Schedule C annexed hereto numbering 1 to 10 inclusive. The said costs to be taxed in default of agreement on a Solicitor and Client basis, and on the basis that the said proceedings were heard together as one composite set of proceedings with provision for one instructions fee and one set of Brief fees for all of the work carried out in all of the proceedings scheduled hereto, together with outlay in all of the proceedings, together with the costs of all the Pleadings, Affidavits etc., the Court having certified for Senior Counsel in the Circuit Court and the High Court proceedings.

6. That the proceedings entitled **The Circuit Court - Midland Circuit - County of Longford - Record Number** Between **Patrick Delaney, Mary Delaney and James Delaney Plaintiffs and The County Council of the County of Longford Defendants** (record number 19/87) be struck out with no Order as to costs.
  
7. That the proceedings as set out in Schedule D annexed hereto and numbered 1 to 13 inclusive be struck out by consent with an Order for taxation of the Plaintiffs' costs incurred up to the 6th day of October, 1992 be taxed in default of agreement on a Solicitor/Client basis.
  
8. Liberty to apply to the Circuit Court

## SCHEDULE A

- 1 Adequate security of the site as a whole, by means of a fence or wide cut-off drain so as to prevent unauthorised access to the tipping area, lagoon or other parts of the landfill site when the entrance is closed.
- 2 Provision of a secure controlled entrance in order to prevent unauthorised access at all times.
- 3 Identification and control of all wastes arriving on site.
- 4 Elimination of the practice of letting leachate accumulate in a lagoon on the site.
- 5 Imposition of strict control over the quantities of liquid wastes accepted at the site, so as to reduce the rate of infiltration and leachate production.
- 6 Operation of the landfill site on the "cell" system with only one cell being "open" or active at any one time, and compaction and covering of the refuse with soil or other suitable material after each day's tipping.
- 7 Capping and grading of each completed cell surface with clay or other suitable impermeable material so as to prevent the penetration of surface water into the landfilled refuse.
- 8 If the monitoring programme specified in 14 below should show any evidence or indication that polluting matter is being discharged to surface or ground water from the landfill operation to an extent that it gives rise to significant contamination then the leachate must be managed and treated (either on-site or off-site) to an appropriate standard suitable for discharge.

- 9 Installation of a system to vent or otherwise prevent the build up of methane gas in the landfill mass.
- 10 Control and elimination of on-site fires, including training of site personnel in fire fighting and the provision of appropriate fire-fighting equipment.
- 11 Site personnel to receive training in identifying and dealing with suspect or unacceptable wastes with clear instructions regarding refusal.
- 12 Implementation of an extensive landscaping programme around the site, with the aim of restoring visual and environmental amenity as far as may be achievable.
- 13 Implementation of a programme to reduce and eventually eliminate vermin from the site.
- 14 Implementation of a comprehensive programme of air and water quality monitoring in and around the site, including the establishment and inspection of dust gauges and regular sampling and analysis of surface and groundwater (from boreholes and local domestic wells); and this monitoring programme to be carried out monthly, initially; and then quarterly if no evidence of significant contamination persists; dust measurements to be made only if there is a reported dust problem; results of all monitoring to be made available to the public.
- 15 Improvement of the surface and margins of the road.

## SCHEDULE B

- 1 On-going rehabilitation of the site to begin immediately, and closure to be completed by 1st January, 1995; final restoration (including capping) to be completed by 1st January, 1998.
- 2 Closure and rehabilitation to be carried out according to a site management, operation and rehabilitation plan and schedule which will be prepared by Malachi Cullen and Partners. The Longford County Council to submit this plan to the residents for their examination by 31st December, 1992; and in this consultation process the ~~input~~ <sup>n</sup> and concerns of the residents to be taken into account as far as practicable; and the County Council will use their best endeavours to meet the concerns of the residents.
- 3 The site rehabilitation plan to provide a clear and detailed, illustrated, account of how the site will, after closure, be integrated into the surrounding landscape.
- 4 Contouring of the entire site and covering with an adequate layer of impervious material such as clay or marl so as to shed rainfall and reduce the ingress of water to the waste.
- 5 Continuing monitoring of the site on a less frequent basis, declining to annually if no detrimental effects or contamination is evidenced.
- 6 All monitoring results to be made available to the public and the representative of the local residents.



- 7 If the monitoring shows any significant contamination, the County Council is to take responsibility for the management of leachate, for its containment and (if necessary) for its removal and/or treatment.
- 8 Installation of a system to vent or otherwise prevent the build up of methane gas in the landfill site.
- 9 The site of asbestos burial to be clearly marked, it being noted that one site is to be identified by Laurence Burke, Clonard, Ballymahon and that the second site has been identified by the Defendants and these two areas to be strictly off limits for any mechanised or pedestrian traffic, works, excavations, or any other interference or disturbance of any nature whatsoever, other than all necessary rehabilitation works to be carried out under the terms of this Consent.
- 10 Monitoring of surface water and ground water within and adjacent to the site until all significant traces of contamination by leachate have ceased.
- 11 Ensuring that the site is secure and access if not possible until capping has been completed and the site has been made safe.
- 12 Landscaping the perimeter of the site and seeding the domed cap with suitable vegetative cover, e.g., grass and clover mixture, which will have the effect of further reducing infiltration by rainfall and will improve the appearance of the closed site.

## SCHEDULE C

<u>RECORD NUMBER</u>	<u>TITLE</u>
1. E15/92	James & Mary Delaney v The County Council of the County of Longford.
2. E16/92	Michael Breheny v The County Council of the County of Longford.
3. E17/92	William & Nora Byrne v The County Council of the County of Longford.
4. E18/92	Mary Casey v The County Council of the County of Longford.
5. E19/92	Padraig & Patricia Delaney v The County Council of the County of Longford.
6. E20/92	Tom & Anne Delaney v The County Council of the County of Longford.
7. E21/92	Sean Delaney v The County Council of the County of Longford.
8. E22/92	Seamus Keegan v The County Council of the County of Longford.
9. E23/92	Tom McCormack v The County Council of the County of Longford.
10. E24/92	The County Council of the County of Longford v Albert Coffey & Caroline Coffey & Patrick Fallon.

SCHEDULE D

RECORD NO.	TITLE
1. E43/92	Sean & Annette Burke v The County Council of the County of Longford.
2. E42/92	Pat & Margaret Lloyd v The County Council of the County of Longford.
3. E44/92	Edward & P.J. Walsh v The County Council of the County of Longford.
4. E41/92	Edward, Bridget & Elizabeth Nestor v The County Council of the County of Longford.
5.	Larry & Nancy Burke v The County Council of the County of Longford.
6.	Albert & Caroline Coffey v The County Council of the County of Longford.
7.	William & Kathleen Kavanagh v The County Council of the County of Longford.
8.	Joe Walsh v The County Council of the County of Longford.
9.	Michael & Marian Higgins v The County Council of the County of Longford.
10.	John & Mary Clancy v The County Council of the County of Longford.
11.	Anna Kavanagh v The County Council of the County of Longford.

12. Des & Mary Byrne v The County  
Council of the County of Longford.

13. E40/92 Peter & Angela Hoare v The County  
Council of the County of Longford.

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