

Kerry County Council



Waste Licence Ref No. W0001-04

REPORT TITLE

**North Kerry Landfill
Annual Environmental Report**

Reporting Period:

January 2010 – December 2010

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1.0 Introduction

Kerry County Council operates a municipal solid waste landfill facility at Muingnaminnane, Kielduff, Tralee, Co. Kerry. It is located approximately 6 miles northeast of Tralee, in the Stacks Mountains. The landfill site accepts solid waste arising from the entire county of Kerry. This waste is placed in lined cells in a controlled manner. The landfill is operated under licence W0001-03 up to 23rd March 2010 and under the reviewed licenced W0001-04 from the 24th March 2010 onwards as issued by Environmental Protection Agency (EPA).

This Annual Environment Report is prepared in accordance with Condition 12.6 and Schedule F of Waste Licence W0001-04.

2.0 Reporting Period

The reporting period for this Annual Environmental Report is 1st January 2010 – 31st December 2010.

3.0 Waste Activities Carried out at the Facility

Waste disposal activities carried out at North Kerry Landfill are in accordance with Part 1 of Waste Licence W0001-04 which outlines the waste disposal activities licenced in accordance with the Third Schedule of the Waste Management Acts 1996-2008. Licenced activities include:

- Class 2** Land treatment, including biodegradation of liquid or sludge discards in soils.

- Class 4** Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.

- Class 5** Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
- Class 6** Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.
- Class 7** Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcinations) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.
- Class 11** Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
- Class 12** Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
- Class 13** Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Waste recovery activities carried out at North Kerry Landfill are in accordance with Part 1 of Waste Licence W0001-04 which outlines the waste recovery activities licenced in accordance with the Fourth Schedule of the Waste Management Acts 1996-2008. Licenced activities include:

- Class 2** Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
- Class 3** Recycling or reclamation of metals and metal compounds.

- Class 4** Recycling or reclamation of other inorganic materials.
- Class 10** The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
- Class 11** Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
- Class 13** Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

4.0 Quantity and Composition of Waste Received, Disposed and Recovered:1st Jan – 31st Dec 2010

Waste tonnage disposed of at North Kerry Landfill during the reporting year (2010) decreased on the previous year (2009) this is due in part as main private waste contractors disposed of their collected waste outside of Co. Kerry for the reporting period and to the fall in the economy resulting in a significant change in the disposal habits of members of the public. The quantity of commercial and construction and demolition waste delivered directly to the landfill site being significantly reduced. The change in consumer spending for the reporting period can be seen in the quantities of WEEE sent for recycling in comparison to the previous year.

It is expected that waste disposal rates at North Kerry Landfill will continue to drop in the next reporting period mainly due to new restrictions introduced in Waste Licence W0001-04 (2010) in relation to landfill of BMW and the increasing market pressure on North Kerry Landfill to compete economically for waste. It is expected that all main private waste collectors operating in Co. Kerry will dispose of the waste outside of Co. Kerry for the next reporting period. The only waste guaranteed to North Kerry Landfill in the next reporting period is that which is controlled by Kerry Local Authorities.

The weight of the waste accepted into North Kerry Landfill Facility for disposal for the reporting period was 20,986.99 tonnes. This comprises of the following breakdown:

<i>Waste Stream</i>	<i>Tonnes</i>
Mixed Municipal	12,227.81
Commercial Waste	297.31
Household Waste	8,461.87
Total	20,986.99

Table 1 Waste Stream Break down for reporting Period.

Appendix I contain a monthly tonnage of waste accepted on site during the reporting period.

Appendix II contains a breakdown of waste by classification and origin accepted on site for disposal during the reporting period.

Appendix III contains waste collected on site for recovery/recycling/disposal off site.

Quantity of Waste disposed at facility: May 1994 – 31st Dec 2010

Since opening in May 1994 the total quantity of waste disposed of at the facility is 741,049.99 tonnes.

Appendix IV shows a yearly break down of tonnage from 1994 – 2010.

5.0 Remaining Capacity and Projected Closure Date

Waste disposal/placement is currently being carried out in cell 16; it is estimated at current waste disposal trends that waste disposal/placement in cell 16 will cease in September 2011.

The development of three new cells 17, 18, 19 was completed in 2010, and the construction quality assurance reports for these cells has been lodged with the agency for approval. Cell 19 will be the first cell of the new development to receive waste in September 2011.

Appendix V contains proposed filling sequence for cells 17, 18 and 19.

Remaining Capacity of developed area = 107,770 m³

Allow 10% reduction for daily and intermediate cover, remaining fill area

Remaining developed fill area = 96,993 m³

98% compaction rate = 95,000 tonnes approx

The intake of waste over the next few years is uncertain therefore take 20,000 average tonnage per year.

Number of years of developed capacity = 4 years 9mth

Phase 9 filled end 2016.

Remaining undeveloped licensed capacity volume = 509,012 m³

Volume available for waste = 458,110 m³

Projected tonnage capacity = 450,000 tonnes

Year predicted capacity at a rate of 20,000 tonnes/annum to 2016 and 10,000 tonnes/annum thereafter (due to BMW restrictions) = 35 years approx

Predicted completion date and year of closure of landfill if the entire site is fully developed = 2046 approx this is subject to disposal rate change.

6.0 Method of Deposition of Waste at North Kerry Landfill

6.1 Large vehicle access/private cars with large trailers:

The current arrangement for disposing of waste in cell 16 is carried out on a pre-built pre-planned tip head. The tip head is constructed with custom made concrete blocks. This method was first introduced as the cells were built 7/9m into the original ground level and access to the cell would be difficult by large tipping trucks.

The tip head height is normally kept at a height of three metres, thus allowing sufficient capacity for waste to be deposited below the tip head prior to compaction. The tip head is guarded by a locked gate to prevent members of the public accessing the tip head without supervision.

The current system is set up such that two trucks can tip at the tip head simultaneously, without any waste being deposited on the tip head itself. Additionally, trucks are not required to track across the waste body itself. As sections of the cell fills vertically, the tip head is easily dismantled and moved further along the cell.

At the latter stage of a cells life, it is not feasible to maintain the purpose built tip head an access road is constructed on top of the placed/compacted waste. A temporary level tip is constructed. Waste is deposited on the flat and a bull dozer is used to push the waste ahead of the compacted for placement and further compaction.

The placement of waste and tip head procedures that are currently being used in North Kerry Landfill will have to be reviewed once cell 16 has been filled. Appendix V contains proposed filling sequence for cells 17, 18 and 19.

6.2 Members of the public accessing the site with small quantities of waste.

The majority of members of the public do not access the tip head in order to dispose of their waste. These were directed to the public skip split level area adjacent to the weighbridge office to place their waste into a series of trailer. These trailers are

removed from the public skip area on a regular basis and tipped at the tip head for placement/compaction. Trailers are emptied on average 4 times daily. The weighbridge supervisor takes note of the weight of each trailer before it emptied and this information is added to the daily tonnage records and the end of every day.

In November 2010, the weighbridge office and facility managers offices were moved to the phase 9 development, as a result the position of these trailer were moved to the bunded recycling area which allow members of the public access the trailers to dispose of their waste and are fully supervised.

6.3 Members of the public accessing civic amenity area of the site

Appendix III outlines the types of waste which are accepted in NKL for removal off site for recycling/recovery/disposal. The civic amenity area contains a number of receptacles into which members of the public can deposit specific waste types free of charge for recovery/recycling/disposal. In addition to the concrete slab area there is a shed for the housing of WEEE and Hazardous waste collection.

Additionally the civic amenity are includes an area for the deposition of green waste. With the introduction of BMW target in July 2010, all green waste collected on site is no longer being used as cover material in the active cell but is being removed from the landfill site to the Bord na Mona and EPA licenced site at Kilberry Co Kildare for further processing and reuse.

7.0 Summary Report on Emissions for the Reporting Period.

The following section outlines a summary of the all emission monitoring for the reporting period:

7.1 Emission to Water

7.1.1 Emission to Sewer

42,442.73 m³ of leachate was removed for North Kerry Landfill site during the reporting period. This is a reduction of 31,285.55 m³ on the previous year. This significant reduction is due to the effective capping of cells 13 and 14 in 2009/2010.

Appendix VI shows the quantity of leachate removed per month from NKL to Tralee Wastewater Treatment Plant during the reporting period.

Table 2 shows the total emissions by element to the Tralee Wastewater Treatment Plant in 2010 and its comparison to 2009 figures.

Parameter	Mass Emission (Kg)	Mass Emission (Kg)
	Previous Reporting Year 2009	Current Reporting Year 2010
Leachate Volume (m3)	73,728	47,442.73
Ammonia (NH3)	35,910	16,989.87
Chlorides (as Cl)	31,432	3,154.91
Copper and compounds (as Cu)	1.95	0.14087
Zinc and compounds (as Zn)	45	4.03
Cadmium and compounds (as Cd)	0.019	0
Chromium and compounds (as Cr)	1.8	1.029
Lead and compounds (as Pb)	0.54	0.14
Nickel and compounds (as Ni)	1.4	0.85
Mercury and compounds (as Hg)	0.122	0.00038
Cyanides (as total CN)	3.8	2.2
Sulphate	663	1196
Potassium	15209	3718.125
Sodium	28347	5965.326
Calcium	11146	2900.253
Magnesium	3885	805.4215
Iron	434	176.774
Manganese (as Mn)	238	65.17
COD	88758	21560.91
BOD	24970	2825.837

Table 2 Total Leachate Composition prior to treatment Comparison 2009/2010

7.1.2 Emissions to Surface Waters/Groundwater Monitoring.

Groundwater:

The quality of groundwater in 2010 for Boreholes 1 – 4 and 6 was satisfactory. Two new boreholes were commissioned in 2010 . A replacement for Borehole 1 was constructed due to works on roadway necessitating removal of existing borehole. A new borehole, Borehole No 6 ,was also commissioned and tested on last two sampling occasions.

Ammonia levels were detected in Borehole 5, though at much reduced levels compared with earlier years.

Surface water appears to be intruding into at least two out of five wells as evident from levels of Total organic carbon i.e. Borehole 5 and 6 however nothing like the very high level of 201 mg/lC experienced in Aug 2009 which was more than likely due to excessive levels of rainfall.

Boreholes 2, 3 and 6 were tested for list 1 , 2 organics. No organics of significance were found here. Some Cyanide was detected in Borehole 5, above trigger value. This is currently been investigated.

High levels of lead were detected in Borehole 6 . This maybe due to new metal fittings on Borehole. Further monitoring is required at this newly created borehole to properly assess quality

A higher than normal level of conductivity was experienced in Borehole 2 throughout 2010. This was also accompanied by spikes in chloride. This may have been due to spread of salt, during two cold spells on roads adjacent to borehole in 2010. However, it must be reiterated that quality is still satisfactory. Further investigation is been undertaken i.e. increased chloride and conductivity monitoring.

Appendix X contains a copy of the Annual Environmental Report – Physio Chemical Monitoring of Muingnaminnane Landfill 2010.

Surface water:

Results from monitoring over last 10 years indicates that most significant threat or impact from Landfill activities in surrounding waters is suspended solids

Samples were obtained “in site monitoring” from Stations *SWML 1,2,3,4,5,10,11 and 12* which are located in perimeter drains draining landfill.

Monitoring of Stations 6,7,8 and 9 have ceased as they have been infilled as a result of site works. There was a noticeable increase in suspended solids in receiving waters at W1 during 2010.. This despite the fact that 2010 was the driest year in period 2007 to 2010.

There was also much less significant impact from Suspended Solids on off site SW1.

High suspended solids in river waters may impair fish spawning grounds particularly in winter and spring. Occasional pulses of suspended matter entering these sites are more than likely the main contributory factor for unsatisfactory biological quality at this site.

Ecological assessment of *W1* In 2007 denotes a Q3 value (moderate pollution), which still reflects some impact. Further assessment, as part of river basin Small stream risk survey(*SSRS*, of this site in 2009 denoted a stream at risk.

Because of importance and significance of Suspended solids monitoring of both W1 and SW1 are at a much higher frequency for this parameter than license obligations.

Impact of Ammonia levels on receiving waters

Throughout most of 2010 there was negligible levels of Ammonia detected at main receiving water site W1. However this changed in December with a dramatic level of 0.62 mg/l NH₄ detected.

Table 2 below shows Ammonia levels in 3 on site surface water drains as well as in W1 from period Nov 2010 to Jan 2011 and compares them with 7 year median levels for same stations

Table 2: Ammonium levels (mg/l NH₄) in surface water landfill sites				
	SWML5	SWML4	SWML2 (lagoon)	W1
7 year median	0.045	0.04	0.03	< 0.02
17/11/2010	< 0.02	< 0.02	< 0.02	< 0.02
06/12/2010	19.4	15.1	64	0.62
15/12/2010	5.14	11	60.8	0.07
17/01/2011	5.48		0.61	

Samples taken in December starting on 6th showed very high levels of Ammonia in drain , lagoon and impact site **W1** above normal levels i.e. 19.4 mg/L at **SWML5** 15.1 mg/l at **SWML4** 64 mg/l at **SWML2 (lagoon)** and 0.62 at surface water impact site (w1). These were significantly above respective 7 year median values for these sites i.e. 0.045 mg/l (**SWML 5**), 0.04 mg/l (**SWML4**), 0.03(**lagoon**) and < 0.02 mg/l (**W1**)

Indeed the levels experienced at sites on drain were the highest ever recorded and denote significant contamination.

Lower results were noted on 15th although still quiet high. Decline in contamination was then noted on subsequent days.

The Ammonia level experienced at impact site **W1 (0.62)** was the highest there in at least 5 years and indicates definite evidence of pollution. To put this in context the recent surface water regulations specify that annual average for Ammonia in a

surface water of good status should not exceed 0.083 mg/l (as NH₄) or a 95% percentile value of 0.18mg/L(as NH₄)

Status of W1 On 2011-05-06

Three samples have been taken in months Jan to April from impact site –all are of good quality (ammonium levels less than 0.04 mg/L) which indicates that situation experienced in dec 2010 has greatly improved

Results for this site show that in 2010 **W1** did not achieve good status as far as Ammonia levels were concerned i.e. average of 0.123 mg/L and 95% percentile of 0.48mg/L

Ponding of liquid close to SWML5

Further investigation revealed ponding of liquid on outside of landfill perimeter close to SWML 5. Analysis of this liquid showed high levels of ammonia (**5.65 mg/l NH₄**) consistent with presence of leachate

In conclusion analysis denotes significant contamination at drain flowing into lagoon as well as corresponding impact on surface waters downstream of lagoon.

No significant Ammonia levels at other impact site **SWI** were detected in 2010 .

Conclusion:

- Compromise water quality. Contamination is noted in BH5 following previous trends. An increase in conductivity coupled with increase in chloride levels was noted in BH2
- Evidence of siltation was evident in sites W1 and SW1 (headwaters of Lee and Smeralagh)
- There were significantly elevated levels of Ammonia noted in main receiving water impact site W1
- Evidence of leachate was detected in all three leachate detection manholes

Appendix X contains a copy of the Annual Environmental Report – Physio Chemical Monitoring of Muingnaminnane Landfill 2010.

7.2 Emissions to Air**7.2.1 Landfill Gas Monitoring**

Gas management at North Kerry Landfill is an interlinked system of mutually reinforcing actions no one of which can fully control or manage the generation of LFG from the deposited waste mass. In combination however, they comply fully with the requirements of the licence.

The Systems and Operations include:

- Active management of the gas control infrastructure
- Introduction of new gas collection systems
- Odour patrol and consequent reactive measures
- Monitoring and testing of infrastructure

The infrastructure in place at North Kerry Landfill includes the construction of a basal liner and capping system.

Outside the footprint of the landfill is a network of LFG monitoring boreholes. There are constructed in a grid around the footprint of the area that waste has been

deposited within. These wells are monitored on a weekly cycle for the presence of a suite of indicator gases that would signal the possible migration of LFG.

Perimeter Gas Well no 6 continues to show methane and CO₂ concentrations above the allowable throughout the year. This is a historically problematic well. In 2004 wells 6a-d were constructed to monitor the gas migration in the vicinity of the gas well. These perimeter gas wells also showed gas concentration levels in excess of the allowable at times during the year.

Work done to eliminate this problem: the upgrading of the gas extraction network from the waste body as proposed in the B9 project and the introduction of the gas utilisation engine in 2011 will extract more gas from the waste body and reduce the fugitive emissions from the waste body.

8.0 Resource and Energy Consumption.

The following is the energy consumption for North Kerry Landfill for the reporting period.

8.1 Diesel

The diesel usage for North Kerry Landfill for the reporting period 2010 was 60,249 litres. This is a reduction of 18,763 litres in comparison with 2009 figures. This is due to the reduction of waste being compacted and landfill on site and improved cell size management on site over the reporting period.

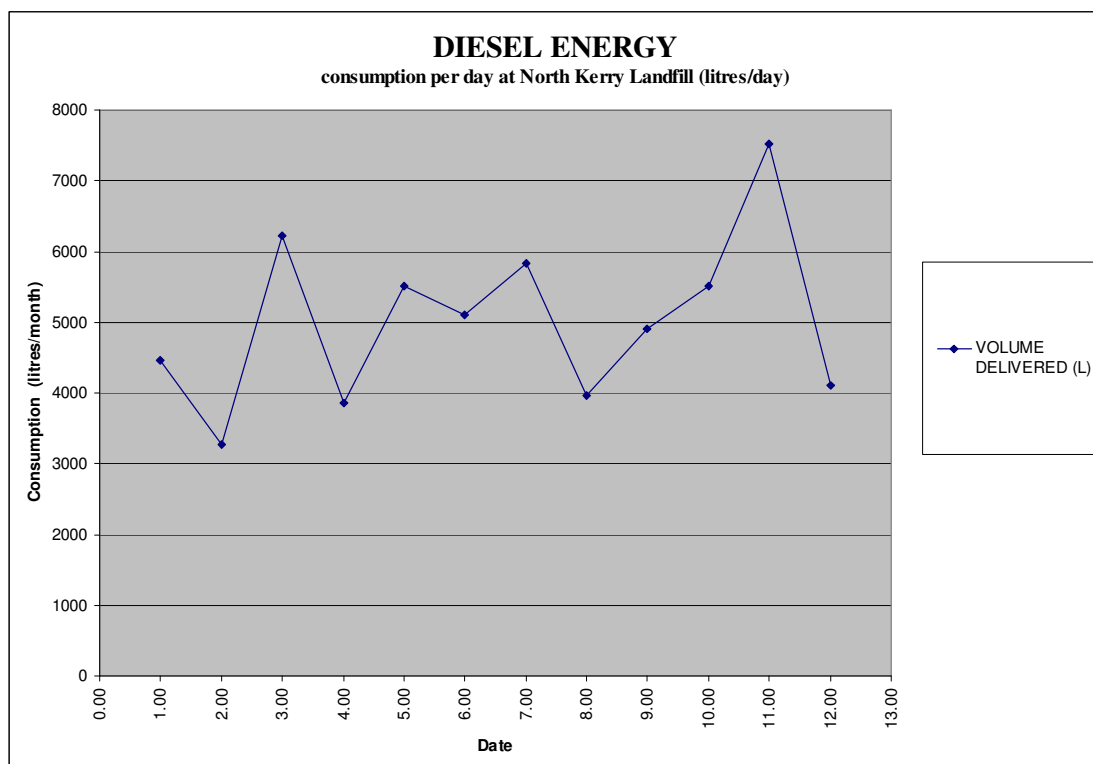


Figure 1- Diesel Consumption North Kerry Landfill 2009

8.2 Electricity

The electricity usage for the facility during the reporting period was 207,043 kilowatt hours. This is an increase of 3,704 kilowatt hours for the reporting period 1st Jan – 31st Dec 2009. This can be contributed to construction work on site which included contractor's compounds, offices, canteens etc. Additionally the extra power usage can also be contributed to phase 9 weighbridge office construction: drying out and commissioning for Q1 and Q2 of the reporting period.

9 Proposed Development of the Facility and timescale of the Development

The following projects are proposed for construction at North Kerry Landfill over 2011:

Rain Water Diversion Bund Cell 19– commencing Q2

The purpose of the works is to reduce the plan area of cell 19 that will produce leachate once waste filling commences. The line of the proposed diversion bund is indicated on Drawing Number SEW 02/01. Initially the leachate stone drainage blanket will be carefully removed to expose the geotextile protection layer. An area in width of approximately 2 m will be exposed to allow working space.

As the stone is removed this will expose the leachate collection pipe work. The pipework will be hand cut leaving a space of approximately 1.5 m between the ends of the pipework. The ends of the cut pipework will be marked with a marker plate above the level of the replaced leachate stone to indicate the location where the pipework will have to be reconnected once the eastern section of cell 19 is ready for filling. Once the stone has been removed a line will be marked on the geotextile to set out the outer face of the clay diversion bund. Site won low permeability clay will be imported into the cell and placed on top of the geotextile along the marked line.

The bund will be approximately 1m in height and 0.5 m in width across its top – namely 0.75m³/m run of bund. It is not intended that all rain water within the eastern section of the cell will be diverted as some will permeate through the geotextile – however as the elevation of the cell floor will be higher on the eastern side leachate will not be able to contaminate the rain water. A submersible pump will be placed on the lower end of the bund run as the surface water builds up and it will be pumped to the surface water holding lagoon. All surface water is continuously monitored at the inlet and outlet from the lagoon. Particular precautions will be taken when removing the collection blanket, all work within 150mm of the liner will be completed by hand, only a mini excavator will be used with a grading bucket and all works will be directly supervised. All works close to the liner will be completed by hand. When the

eastern side of the cell is ready to accept waste then the clay bund will be carefully removed. The collection pipes will be reinstated with couplers and the collection blanket renewed. As an additional precaution a buffer zone will be maintained between the clay diversion bund and placed waste.

Gas to energy utilisation project – commencing Q2/Q3

It is proposed to locate the gas utilisation compound at the current location of the public waste acceptance skips.

The compound will consist of the following infrastructure:

- 1 Jenbacher JGC208GS Generation Set Engine and associated ancillary works (i.e. Concrete pad)
- 2 Two substation buildings for the ESB and B9 20kV equipment
- 3 Cable and trenches ducts
- 4 Installation of containerised office/welfare unit/storage unit.

The compound will be secured with 1.8m high green wire weld mesh fencing.

A new manifold will be installed which will be similar in size and dimension to the existing manifold but it will be fabricated using HDPE pipe and fittings and replacement isolation butterfly valves. Provision will be made to make future connection at either end of the manifold and blanketed off with stub, gaskets and blanking plates,

A control system is proposed to give gas priority to the generator set. *B9 Power* will provide a simple 2 wire voltage free signal to indicate that the engine is running or is about to start. This signal is to be used at the flare to either switch off or turndown the gas flow by an amount approximating to the gas consumed by the engine.

In the event of simultaneous failure of the Gas engine and the flare, *B9 Power* will be contacted by a telemetry system. This telemetry system will be a 24 hour/7 days a week system and *B9 Power* will respond to the call-out within a reasonable timeframe.

A connection will be made into the existing incoming line at the flare with a new 200mm pipe surface laid down the embankment to the gas compound.

A 'tee' connection will be made into the existing gas header to the flare. The new branch from the tee will be piped to a new gas booster package installed in the power generation compound to pressurise the gas supply to the engine (a nominal delivery pressure of 100 mbarg).

A gas booster skid is to be installed in the power generation compound will have an integral knock out vessel.

Gas piping from the gas booster skid into the power generation compound to the generator set container will be fabricated from stainless steel.

Leachate Pipeline Construction – commencing Q3/Q4

The purpose of the works is to provide a pipeline transfer system instead of the current tankering by road arrangement for leachate that is generated at NKL. The pipeline will convey the leachate to Castelisland WWTP where it will be adequately treated.

Appendix XIV contains the associated Specified Engineering Works for the above projects as approved by the Agency.

10 Volume of Leachate Produced and Volume of Leachate Transported off Site.

Over the reporting period 42,442.73 m³ of leachate was produced on site. This is 31,285.12 m³ less than was produced in the reporting year of 2009. Total quantity of leachate produced site since the landfill site opened in May 1994 to the end of the reporting period is 603,459.14 m³.

No leachate has been treated on site, all leachate is tankered off site for treatment.

Over the reporting period, 42,442.73m³ of leachate was tankered off site to Tralee Wastewater Treatment plant for treatment. This equates to 1,596 loads transported to Tralee Wastewater Treatment Plant. This is an reduction of 1,003 loads on the previous reporting year.

<i>Month</i>	<i>Leachate Volume (m³)</i>	<i>No. of Loads</i>
<i>January</i>	4289.94	140
<i>February</i>	5666.38	183
<i>March</i>	3324.86	107
<i>April</i>	4080.68	131
<i>May</i>	1711.48	55
<i>June</i>	1236.44	40
<i>July</i>	4304.64	140
<i>August</i>	2208.06	71
<i>September</i>	4902.34	158
<i>October</i>	2393.60	220
<i>November</i>	6719.70	220
<i>December</i>	1663.61	54
<i>Total</i>	<i>42,442.73</i>	<i>1,596</i>

Table 3 Leachate Volumes Tankered off –site 2010.

11 Report on Development Works Undertaken During the Reporting Period.

11.1 Phase 9 Cell Development

Development of cell 17/18/19 continued over the reporting period. The engineered cells with leachate extraction were substantially fully completed by October 2010.

A new surface water lagoon was installed on site for the new development area, this was completed by December 2009 monitoring equipment was installed in early 2010.

An enclosed concrete leachate holding tank was constructed on site with a decided bunded leachate tanker area. The tank was commissioned in early 2010.

A new weighbridge and weighbridge office with file room, control room, offices, canteen, weighbridge operators office and toilet facilities, were constructed in 2009 and operations moved to the new offices on the 13th November 2010.

11.2 Phase 7 Cell Capping

Cells 13 and 14 were permanently capped with an LDPE liner in 2009 and fully completed in 2010. The capping system also includes twelve new gas extraction wells with control manifolds and leachate recirculation tank and associated pipework

12 Timescale for Proposed Works During the Coming Year.

	<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>	<i>Fourth Quarter</i>
Leachate Pipeline Construction				
Gas to energy utilisation project				
Rain Water Diversion Bund Cell 19				

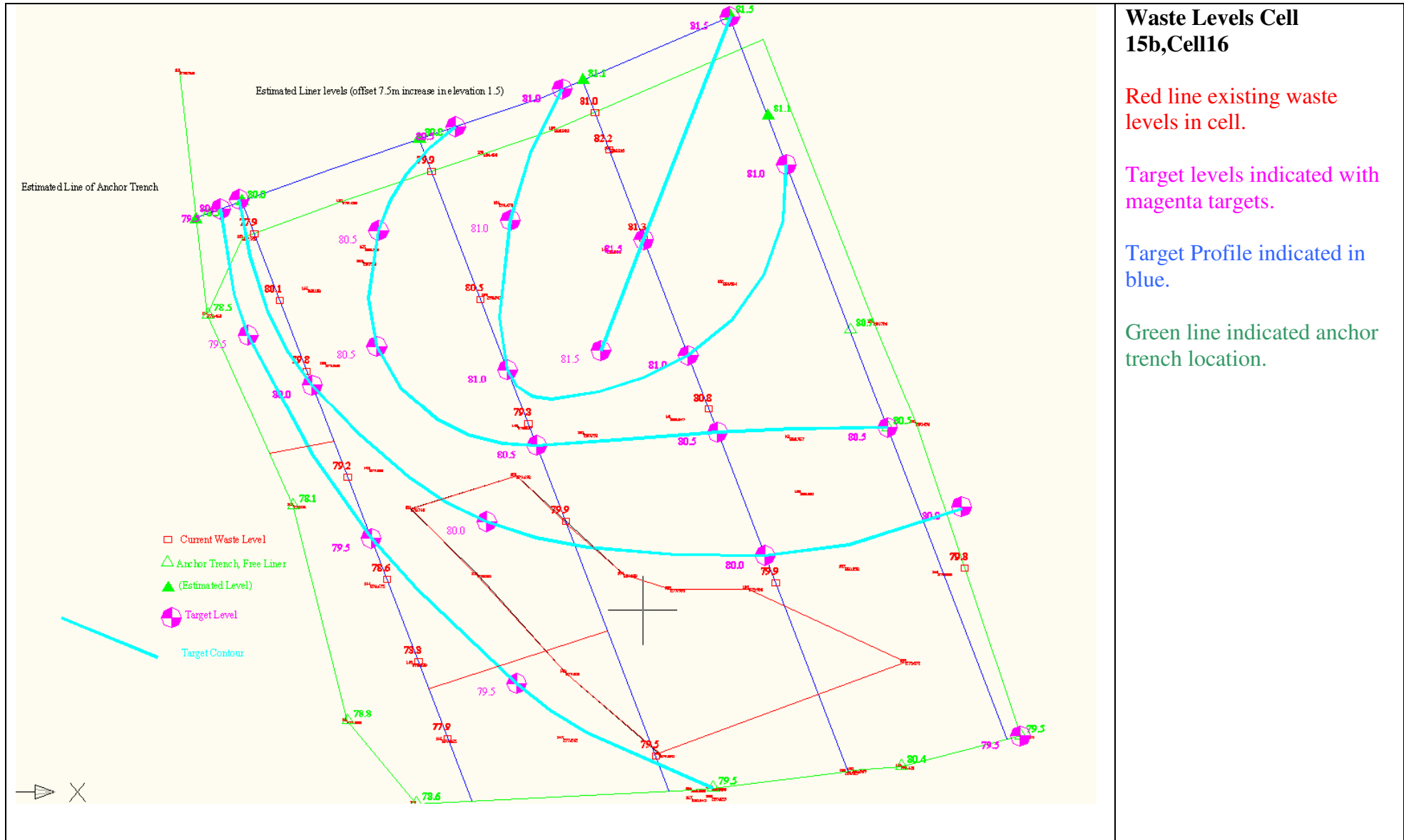
13 Report on Restoration of Completed Cells/Phases

By the end of the reporting period cell 1-14 (Phase 1-7) were fully capped and restored. Each cell contains leachate and gas extraction and monitoring.

Cell 15a/b and Cell16 (Phase 8) are active tipping areas accepting waste.

Cells 17, 18, 19 (Phase 9) are newly constructed cells ready to accept waste subject to EPA approval.

14 Site Survey Showing Existing Levels of the Facility and the End of the Reporting Period.



Waste Levels Cell 15b, Cell 16

Red line existing waste levels in cell.

Target levels indicated with magenta targets.

Target Profile indicated in blue.

Green line indicated anchor trench location.

15 Schedule of Environmental Objectives and Targets for the Forthcoming Year.

<i>Target Area</i>	<i>Objective</i>	<i>Works Required</i>
<p><i>Odour Management</i></p> <p><i>Reduction in Fugitive Gas Emissions</i></p>	Reduction in number of off site odour experienced	<p>Regular patrol of gas collection infrastructure to ensure that there is no blockages on the lines.</p> <p>Application of horizontal gas extraction from active cells.</p> <p>Adequate intermediate capping on capped cells prior to final cap</p> <p>Gas extraction of intermediately capped cells</p>
<i>Surface Water Emissions</i>	Keep Surface Water Emissions within agreed limits	<p>Proper management of leachate on site</p> <p>Regular inspection of surface water drains</p> <p>Regular servicing of TOC/Turbidity Meters on site.</p> <p>Regular monitoring of TOC and Turbidity monitors at Lagoons</p> <p>Regular inspection of bunded area for integrity on site</p>

Target Area	Objective	Works Required
<i>Ground Water Emissions</i>	Keep Ground Water Emissions to within agreed limits	Proper management of leachate levels on site Regular inspection of bunded area for integrity on site
<i>Leachate Management</i>	Reduction in the quantity of leachate produced on site	Capping of intermediately capped cells within 1 year of final placement of waste Reduction in the fill area of cell into which surface water flows.
<i>Dust</i>	Keep dust deposit limits within allowable level	Regular spray of site roads with water at time of dry and windy weather.
<i>Vermin</i>	Keep vermin population on site to a minimum	Regular baiting of bait boxes through out the site Particular attention to be paid to area of know or sighted vermin activity
<i>Bird Control</i>	Keep number of crow and sea gulls on site to a minimum	Bird control on site from Dawn to dusk to aid in the reduction in the number of bird on site during day light.
<i>Flies</i>	Keep the fly population on site down in the active cell	Regular spray of the waste in the active cell at times of heat and particular emphasis on spraying during summer months

Target Area	Objective	Works Required
<i>Litter – windblown on site</i>	No windblown litter visible outside the active cell area	Proper and complete netting around the active cell Regular litter picking patrols on site to pick up any windblown litter. Stopping the access to the site of rota-press vehicles at times of high winds
<i>Litter – On main road to landfill site</i>	Reduction in the number of bags of waste lost from trailer on the way to the landfill	Enforcement of the three strikes and your out rule in operation on site in relation to uncovered loads entering the landfill site. Quick response to clean up any reported waste on the main road to the landfill
<i>Energy Resources</i>	Reduce the quantity of diesel and electricity used on site	
<i>Reduction of BMW entering the landfill site</i>	Reduce the percentage of biological municipal waste entering the landfill site to 47%	Provide organic bin for cold callers to the site and have such material removed for further processing. Cease the use of green waste as cover material. Continue to take green waste on site but charge the true cost of treatment for the green waste and have it removed by contractor for further processing.

16 Summary of Procedures Developed by the Licensee

The Following are the procedures and documents developed by the licensee:

Procedures

Revised Gas Monitoring Procedure

Revised Leachate Level Monitoring Procedure

Revised Waste Acceptance Procedure – Uncovered loads entering landfill site

Revised Complaints Management Procedure.

Plans

Operational Risk Assessment

Environmental Liability Risk Assessment

Closure Remediation Aftercare Management Plan

18 Environmental Incidents and Complaints

18.1 Environmental Incident

There were no environmental incidents reported to the Agency for the reporting period.

18.2 Complaints

19 complaints were received by the management of the facility for the reporting period. This is a one extra complaint received for the previous year. The complaints can be broken down into the following categories:

Issue	No. Complaints 2008	No. Complaints 2009	No. Complaints 2010
<i>Odour</i>	26	9	6
<i>Illegal Dumping</i>	8	3	7
<i>Rubbish on Main Road</i>	3	3	1
<i>Uncovered/unsecure loads being admitted into landfill site</i>	3	0	0
<i>Flies</i>	2	0	1
<i>Site Infrastructure</i>	2	1	3
<i>Speeding Leachate Trucks</i>	0	1	0
<i>Noise from Leachate Lorries at Treatment Plant</i>	2	1	1
<i>Windblown litter</i>	1	0	0
Total Number of Complaints	47	18	19

Table 4 Breakdown of Complaints Received during the reporting period

18.3 Work Done to Alleviate Complaints:

18.3.1 Odour:

Horizontal gas wells are being installed in the active cell and connected to the flare during filling.

Twelve new gas wells installed in cells 13/14, cells 13 and 14 capped and sealed.

18.3.2 Illegal Dumping:

Quicker response time to complaints received, closer co-operation with litter warden for the area.

18.3.3 Other

Quarterly road side clean ups being carried out by Area Office on main road leading to the landfill site. Inspection of the waste from these clean ups revealed that it consisted (up to 90%) of plastic bottles, takeaway coffee/tea cups, takeaway wrappers etc which had been thrown out of car windows. Larger items which have fallen from vehicles carrying waste to the landfill site are removed once a complaint is received in relation to them.

18.3.4 Site Infrastructure:

Two of the complaints in relation to the site infrastructure was in relation to the new weighbridge and the angle of entry onto the weighbridge. This was resolved with signage. The remaining site infrastructure complaint was in relation to snow and ice on the access road to the landfill due to inclement weather.

18.3.5 Noise from Leachate Lorries at Waste Water Treatment Plant early morning:

New driver for the contractor left his vehicle at the treatment plant overnight causing the noise problem. This practice ceased and the contractor contacted the member of the public directly and apologies for the inconvenience cause.

Appendix IX has a full list of all complaints received.

19 Report on Financial Provision

The acquisition, setting-up and development of North Kerry Landfill and construction and capping of cells are financed through a series of loans paid bi annually funded from Kerry County Council's revenue account. In addition annual operational costs of North Kerry Landfill site fund also reflect costs associated with maintenance of previously capped cells.

Kerry County Council has a Landfill Aftercare and development Fund which it makes a significant annual contribution to from Revenue Budget each year. This provision as at the end of 2009 amounted to €3.7M.

The C.R.A.M.P report as submitted to the Agency during the reporting period estimates that an annual sum of €200K-300K is required to maintain the Landfill site both during its active phase and closed phase to 2065. Kerry County Council is well positioned to meet its financial liabilities associated with North Kerry Landfill at present and into the near future.

Details of Loans:

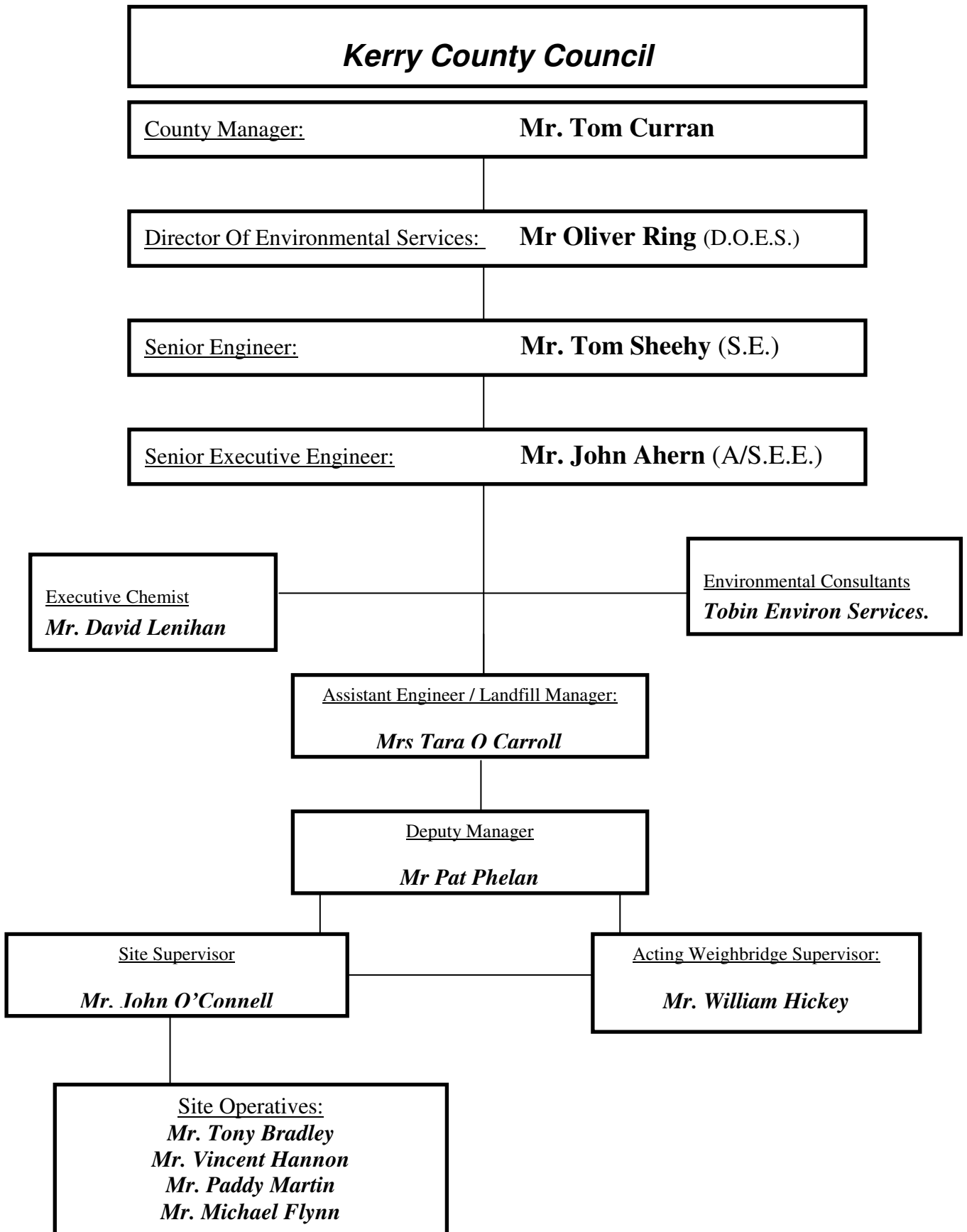
Loan No 1 - Purchase of land for an extension of the landfill Site – €1.3m, drawn down 2008. Amount repaid in 2008 = €126,200. Annual Schedule of Repayments - Bi Annual Repayments estimated at €126,200 p/a. 8.5 years remaining.

Loan No 2 - Purchase of land for an extension of the landfill Site – €1.3m, drawn down 2007. Amount repaid in 2009 = €155,600. Annual Schedule of Repayments - Bi Annual Repayments estimated at €155,600 p/a. 8 years remaining.

Loan No 3 – Landfill Extension Development Costs - €2.5m, drawn down 2008. Amount repaid in 2009 = €177,400. Annual Schedule of Repayments – Bi Annual Repayments estimated at €177,400 p/a. 14 years remaining

Loan No 4 – Landfill Development – Amount repaid in 2009 = €41,700. Annual Schedule of repayments – Bi Annual Repayments estimated at €41,700 p/a. 0 years remaining. Appendix XIII Section 53(A) Financial Provision Return 2009.

20 Management and Staffing Structure at the Facility 2010



21.0 Programme of Public Information

The following files are available for inspection on site by members of the public:

- AER of previous reporting years
- All correspondence with the Agency
- Surface Water Monitoring Results
- Ground Water Monitoring Results
- Perimeter Gas Detection Well Monitoring Results
- Nuisance Control Documentation
- Leachate Chemical Analysis results
- Leachate quantities produced
- Tonnage of waste accepted on site
- Characterisation of waste accepted for landfilling on site
- Operational Procedure Manual
- Waste Acceptance Procedure
- Environmental Management System.

In main office a notice board is on site which contains information in relation to the management structure of the site, waste tonnages accepted over the relevant years, emergency procedure in relation to fire or accident on site and other environmental information as required.

Phase 9 development has the facility of a file store room, it is the intension of landfill management to put a desk in this office which can be use by any member of the public who which to access files on the site.

22.0 Report on the Use of the Annual Fund for the local environment and community initiatives.

Community Fund

		2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
North Kerry Landfill	Allocation	50,600.00	101,200.00	51,695.00	52,980.00	55,075.00	58,190.00	60,720.00	57,835.00	57,232.25	545,527.25
	Expenditure	0.00	29,968.00	72,890.00	95,245.83	43,567.20	36,974.18	17,831.79	54,575.29	40,547.33	391,599.62
	Balance	50,600.00	71,232.00	-21,195.00	-42,265.83	11,507.80	21,215.82	42,888.21	3,259.71	16,684.92	153,927.63

23 Statement of Costs of Landfill

2010		Total Charge Euro
Accelem	Accelem(T)	
60030	Wages	151,099.87
60040	Salaries	44,177.34
60100	ER PRSI	28,795.77
60200	Overtime	66,007.01
60300	Arrears	-105.13
60400	Sick Pay	6,021.94
60500	Annual Leave	23,141.64
60510	Bank Holiday Leave	6,317.05
60600	Travel/Subsistence	898.19
60700	Eating on site allowance	2,120.40
65500	Minor Contracts- Trade Services & other works	226,458.49
65700	Transfer to Fixed Assets/Capitalisation-Assets	24,079.00
65965	Transfer to/from Cap/Rev (Exp)	159,142.39
67500	Non-Capital Equip Purchase - Computers	1,062.36
68500	Non-Capital Equip Purchase - Other	2,977.08
69000	Hire (Ext) - Plant/Transport/Machinery & Equipment	45,973.85
69200	Repairs & Maint - Plant	7,005.63
69250	Repairs & Maint -Computer Equip	0
69260	Repairs & Maint - Other Equip	728.06
69400	Transfers from Machinery Yard	6,370.00
69600	Other Vehicle Expenses	582
70000	Materials	94,963.59
70990	Issues from Stores	4,236.02
71000	Insurance	8,887.38
73400	Staff Travelling & Subsistence Expenses	3,003.43
76000	Communication Expenses	2,007.69
77100	Courier	2,531.73
77200	Security - Property	5,808.07
78000	Training	810.09
79000	Legal Fees and Expenses	250
79900	Consultancy/Professional Fees and Expenses	3,213.76
80000	Advertising	189.44
81000	Printing & Office Consumables	936.51
82100	Statutory Contributions to Other Bodies	21,190.00
85100	Rates & Other LA Charges	19,405.62
85200	Cleaning	3,159.59
86000	Energy	59,268.23
99000	Miscellaneous Expenses	0
99050	Refunds	320.5
	Total	1,033,034.60

24 Metrological, Noise and Dust Monitoring Results

24.1 Rainfall Data

Rainfall for the reporting period 01/01/2010 – 31/12/2010 was 1,365.7 mm. This is a reduction of 571.46 mm on the 2009 reporting period.

True Evaporation for the reporting period was 617.42mm.

Month	Rainfall (mm)	Rainfall (mm)
	2009	2010
January	225.36	164.5
February	44.5	73.3
March	109.9	125.9
April	189.4	91.4
May	158.6	47.00
June	65.2	67.8
July	190.7	186.7
August	220.2	73.8
September	108.9	171.9
October	133.2	130
November	412.1	163.8
December	79.1	64.9
Total	1937.16	1365.7

Table 5 Rainfall Data Comparison 2009/2010

Appendix VIII shows the monthly rainfall and monthly evaporation for the reporting period.

24.2 Noise Monitoring

Southern Scientific were commissioned by Kerry County Council to undertake a noise survey at North Kerry Landfill. The $L_{Aeq(30min)}$ levels detected during the survey were within the prescribed limit of 55dB at two of the three monitoring locations. The exceedence observed at N2 was attributed to site traffic. Traffic volumes passing at N2 were not significant. However, the passing vehicles generated significant short term noise levels because of rattling loaders and trailers attachments due to the road conditions. Noise in the absence of this traffic is given by the L_{A90} and was recorded at 27.9 dB which is typical of a quiet rural area.

Appendix XV contains the Noise Monitoring Report.

24.3 Dust Monitoring

Southern Scientific was commissioned by Kerry County Council to carry out monthly dust deposition monitoring at four locations at North Kerry Landfill site between 14 Sept 2010 and 11th November 2010.

Location	14 Sept – 13 Oct	13-Oct – 11 Nov
D1	68	156
D2	249	412 ¹
D3	49	109
D4	53	121

Appendix VII contains Dust Monitoring results.

¹ The collector gauge contained green coloured water and considerable amount of visible particulates and a large amount of algal growth. During analysis of the sample the dried dish had a large amount of green particulates present. The ashed dish had a large amount of grey particulates present. The ashed residue underwent No effervescence on addition of acid indicating the absence of carbonate in the residue.

Appendix I Monthly Tonnage for Reporting Period:

Waste disposed of in landfill site:

Waste Return Form

Month	Solid Mixed Municipal Waste (tonnes 2009)	Solid Mixed Municipal Waste (tonnes 2010)
January	3,700.85	2,351.51
February	2,410.17	1,695.58
March	2,538.94	1,862.66
April	2,821.50	1,907.36
May	2,676.63	1,678.80
June	2,881.82	1,848.30
July	3,184.24	1,870.50
August	4,105.39	1,31.52
September	4,009.00	1,613.86
October	3,811.72	1,428.58
November	3,820.60	1,669.64
December	3,794.53	1,228.68
Total	39,755.39	20,986.99

Table 6 Waste disposed of at Landfill site during reporting period.

Appendix II Classification of Waste Brought directly to landfill during reporting period:

Name of EACH collector directly delivering waste from kerbside	Source of waste	Waste description	EWC code	Quantity waste accepted (tonnes)
ESB Power Station	Industrial	Resin	10 01 03	12.30
Kerry County Council.	Other (please specify)	Water Treatment Waste not otherwise Specified in the EWC	19 09 99	203.94
Fenit and Dingle Harbour	Other (please specify)	Galley Waste 20 01 99	20 01 99	42.38
Kerry County Council	Litter/street sweepings	Road Side & Street Cleaning	20 02 03	14.60
Kerry County Council	Litter/street sweepings	Road Side & Street Cleaning	20 02 03	10.54
Kerry County Council	Park & cemetery	Graveyard waste	20 02 03	19.34
Tralee Town Council	Litter/street sweepings	Road Side & Street Cleaning	20 02 03	754.76
Tralee Town Council	Litter/street sweepings	Road Side & Street Cleaning	20 02 03	342.22
Kerry County Council - Refuse and Recycling Service	Household	2 bin household waste collection delivered directly to site	20 03 01	2,839.69
Kerry County Council - Refuse and Recycling Service	Commercial	2 bin household waste collection delivered directly to site	20 03 01	57.95
Kerry County Council.	Commercial	Administrative Buildings	20 03 01	82.86
Kerry County Council.	Household	Housing Engineers	20 03 01	32.84
Tralee Town Council - Refuse Collection Service	Household	2 Bin Household Waste Collection delivered directly to site	20 03 01	4,099.70
Tralee Town Council	Commercial	Tralee Town Council - Miscellaneous Waste - Levied	20 03 01	78.36
Listowel Town Council - Refuse Collection Service	Household	3 bin household waste collection service delivered directly to Landfill	20 03 01	558.00
Listowel Town Council	Commercial	Administrative Buildings	20 03 01	0.92
Public Domestic Waste	Household	Household waste delivered directly to site	20 03 01	931.64
Commercial Customers*	Commercial	Commercial waste delivered directly to the landfill by Commercial Customers	20 03 01	156.50
Kerry County Council	Fly-tipped material	Mixed Municipal Waste	20 03 03	132.54
Listowel Town Council	Fly-tipped material	Mixed Municipal Waste	20 03 03	18.06
Coillte	Fly-tipped material	Mixed Municipal Waste	20 03 03	13.62

Table 7 Classification of Waste Brought directly to landfill during reporting period

Name of EACH facility from which waste was delivered and License/ permit no. of this facility	Source of waste	Waste description	EWC code	Quantity waste accepted (tonnes)
Civic Amenity Area NKL	W0001-04	Public Household waste presented in black bags	20 03 01	366.65
Civic Amenity Area NKL	W0001-04	Garden Waste	20 02 01	300.00
Caherciveen Transfer Station	W0087-01	Commercial and Household waste compacted and transferred to landfill without treatment	20 03 01	1,280.50
Milltown Transfer Station	W0069-01	Commercial and Household waste compacted and transferred to landfill without treatment	20 03 01	3,021.26
Coolcaslagh Transfer Station	W0072-01	Commercial and Household waste compacted and transferred to landfill without treatment	20 03 01	4,042.98
Kenmare Transfer Station	W0086-01	Commercial and Household waste compacted and transferred to landfill without treatment	20 03 01	1,266.62
Dingle Civic Amenity Site	W0225-01	Commercial and Household waste compacted and transferred to landfill without treatment	20 03 01	236.50
South West Bins, Kilmorna, Listowel, Co. Kerry		Commercial and Household waste compacted and transferred to landfill without treatment	20 03 01	369.72

Table 13 Classification of waste transferred from other facilities to landfill during reporting period

Appendix III Waste Recovery Recycling

Material type	Suggested EWC codes		Household waste (tonnes)	Non-household waste (tonnes)	Name of destination facility(ies), or collector(s) if directly exported (please provide licence/permit number)	"D" or "R" or "Both" (if a mixture of both, please provide an explanation)	Commentary (if needed)
	(overwrite as appropriate)	Notes					
Mixed residual waste	20 03 01		366.65	-	W0001-04	D	Disposed of on site in an Engineered Cell
Organic waste (food and garden)						SELECT	
<i>food</i>	<i>20 01 08</i>		-	-	<i>N/A</i>	SELECT	<i>N/A</i>
<i>garden</i>	<i>20 02 01</i>		<i>499.94</i>	-	<i>Bord na Mona Horticulture, Kilberry, Co. Kildare W0198 - 01</i>	Both	<i>Jan - June 2010 Approximatley 300 tonnes of Garden Waste used as landill cover (Not Weighted, July - Dec 199.94 tonnes weighted & transported by Bord Na Mona</i>
Mixed dry recyclables	20 03 01		26.06	-	K.C.C. Refuse Collection Service collect & Transport to Dillon Waste Ltd, The Kerries, Tralee WP/07-30	R	Dry Recyclables (Ecosense Bags) sold on site for Paper, Cardboard, Plastic, Aluminium & Steel Cans, & Tetra-paks

Material type	Suggested EWC codes		Household waste	Non-household waste	Name of destination facility(ies), or collector(s) if directly exported	"D" or "R" or "Both"	Commentary (if needed)
Cardboard, newspaper and other paper							
<i>cardboard packaging</i>	<i>15 01 01</i>		<i>59.26</i>	<i>-</i>	<i>Dillon Waste, The Kerries, Tralee WCP -LK-007/07d, WP/07-30</i>	<i>R</i>	<i>Materials Weighed on Site</i>
<i>newspaper and magazines</i>	<i>20 01 01</i>		<i>78.74</i>	<i>-</i>	<i>Dillon Waste, The Kerries, Tralee WCP -LK-007/07d, WP/07-30</i>	<i>R</i>	<i>Materials Weighed on Site</i>
Glass							
<i>glass packaging</i>	<i>15 01 07</i>		<i>33.35</i>	<i>-</i>	<i>Rehab Glassco Ltd, Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare WFP-KE-08-0957-01</i>	<i>R</i>	<i>Used Glassco Rehab Ltd Recycling Reports to completed this Questionnaire</i>
Metals							

aluminium cans (packaging)	15 01 04		1.42	-	Rehab Glassco Ltd, Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare WFP-KE-08-0957-01	R	Used Glassco Rehab Ltd Recycling Reports to completed this Questionnaire
steel cans (packaging)	15 01 04		4.48	-	Rehab Glassco Ltd, Unit 4, Osberstown Industrial Park, Caragh Road, Naas, Co. Kildare WFP-KE-08-0957-01	R	Used Glassco Rehab Ltd Recycling Reports to completed this Questionnaire
other metals (non-packaging)	20 01 40		165.10	-	Hegarty Metals, Dock Road, Limerick City WCP-LK-027/02b	R	Scrap metal
Plastic							
plastic packaging	15 01 02		18.50	-	Dillon Waste, The Kerries, Tralee WCP -LK-007/07d, WP/07-30	R	Plastic Bottles only - Weighed on Site
Composite packaging (e.g. tetrapaks)	15 01 05		-	-	N/A		N/A
Textiles						SELECT	
textiles, packaging	15 01 09		-	-	N/A	SELECT	N/A
textiles, non-packaging	20 01 11		21.58	-	Shannon Textiles WCP-LK-096/08d	R	Old Clothes
lead acid batteries and accumulators	16 06 01*						

		non-portable (automotive and industrial)	7.27	-	ENVA Ireland WCP-LK-052/08d, Campine Belgium MLVA/05-173/gvda	D	Mainly Car Batteries collected at the Site in 2010
Other (e.g. alkaline) batteries and accumulators	16 06 04	portable	1.18	-	ENVA Ireland WCP-LK-052/08d, Accurec Germany	D	1,180 litres collected of small batteries for disposal in 2010 using conversion rate of 1000 l = 1 tonne
		non-portable (automotive and industrial)	-	-	N/A	SELECT	N/A
Waste mineral oils	13 xx xx	<i>lubrication, vehicle, machine, etc.</i>	4.00	-	ENVA Ireland WCP-LK-052/08d,	D	4,000 litres collected of waste mineral oil for disposal in 2009 using conversion rate of 1000 l = 1 tonne
Oil filters (vehicles)			0.96	-	ENVA Ireland WCP-LK-052/08d,	D	960 litres collected of oil filters for disposal in 2010 using conversion rate of 1000 l = 1 tonne
Oil containers (mineral oil) - plastic + metal			0.96	-	ENVA Ireland WCP-LK-052/08d,	D	960 litres collected for disposal in 2010 using conversion rate of 1,000 l = 1 tonne
Waste cooking or vegetable oils	20 01 25		0.25	-	Buckley Eco Fuels, Killarney, Co.Kerry. WCP/LK/95/07c	R	250 litres collected for recovery in 2010 using conversion rate of 1,000 l = 1 tonnes
Waste paint and varnish (including containers)			2.67	-	ENVA Ireland WCP-LK-052/08d,	D	2670 litres collected for disposal on site in 2010 using conversion rate of 1,000 l = 1 tonnes
Aerosols	20 03 99		2.28	-	ENVA Ireland WCP-LK-052/08d,	D	2280 litres collected for disposal on site in 2010 using conversion rate of 1,000 l = 1 tonnes

Table 8 Waste Collected on site and transferred off site for recovery/recycling/final disposal

Appendix IV Cumulative tonnage 1994 – 2010:

	Waste Tonnes	Cumulative Tonnage
1994	16,902	<i>16,902.00</i>
1995	23,505	<i>40,407.00</i>
1996	23,722	<i>64,129.00</i>
1997	25,581.88	<i>89,710.88</i>
1998	33,529.67	<i>123,240.55</i>
1999	57,872.71	<i>181,113.26</i>
2000	60,473.65	<i>241,586.91</i>
2001	63,945.91	<i>305,532.82</i>
2002	62,821.52	<i>368,354.34</i>
2003	50,235.29	<i>418,589.63</i>
2004	48,054.47	<i>466,644.10</i>
2005	34,430.82	<i>501,074.92</i>
2006	60,025.22	<i>561,100.14</i>
2007	56,794.24	<i>617,894.38</i>
2008	62,401.50	<i>680,295.88</i>
2009	39,755.40	<i>720,063.00</i>
2010	20,986.99	<i>741,049.99</i>

Table 9 Cumulative Tonnage 1994 - 2010

Appendix V Filling Sequence Cells 17,18,19

Comhairle Chontae Chiarraí
Kerry County Council



Waste Licence W0001-03

Filling Sequence and Gas Collection Plan
Phase 9

Cells 17/18/19

North Kerry Landfill

September 2009

Prepared By:

*Environment Section
Kerry County Council*

*Roinn Comhshaoil
Comhairle Chontae
Chiarraí*

Introduction

This plan details the following:

- The proposed filling sequence for cells 17, 18 and 19;
- The liner/capping placement sequence for the filled cells (daily, weekly, intermediate and permanent);
- The progressive construction of a gas collection network from Phase 9 development.

This plan outlines the methods that will be adopted and the gas control techniques adopted on site. These techniques are developed with the site specific circumstance taken into consideration.

This plan takes into account the Conditions of Waste Licence W0001/03 and best practice as detailed in the Landfill Gas Management Practice manuals and Best Available Technology available.

Filling Sequence

Cell 19 will initially be filled followed by cell 18 and cell 17.

The filling of Cell 19 will commence from the west via a constructed access ramp and work in a north to south direction until intercell berm 19/18 is met.

The first lift height will be in the regions of 3m. Once this initial area is filled the remaining area to the east will be sub-divided into sections to the intercell berm between Cell 19 / 20.

These will be progressively filled until a complete first lift has been placed within Cell 19.

The pattern will then be repeated and the height of the haul road adjusted to accommodate the filling area at any given time.

Within each section a particular area will be designated the active area. The active area will be kept to a minimum size as is practical taking account for the safe turning distance required for landfill plant.

Side slopes will be raised slightly above the level of the waste as filling progresses. This facilitates the pushing of waste against the inner face and the construction of a robust side slope.

Liner Placement

It is proposed that the sequence of permanent capping actions will be as follows:

- Incremental landfill to finished final profile
- Place intermediate capping material to all finished areas
- Place vertical wells
- Place woven polypropylene cover over sub soil intermediate cover as gas layer
- Connect vertical wells via temporary pipework
- Horizontal gas collection from the cell will still be active
- Once settlement has ceased place final LDPE capping
- Connect permanent vertical wells with permanent piping to manifold on trunk main.

The exact proposal with regard to the lining will be advised to the Agency for agreement in advance through a SEW.

Permanent capping will be LDPE liner with welded seams and welded to the HDPE liner within the anchor trench as appropriate.

Intermediate cover will be placed on all areas that have reached profile height. The intermediate cover will consist of site won low permeability soils spread in layers over the footprint and finished to final profile level.

Temporary Gas Extraction System

KCC have operated a successful horizontal gas extraction system in cells 15 and 16 while active. This has contributed significantly to the capture of gas from the active cell which was conveyed to and destroyed at the flare.

The gas network consist of layers of pipes work approximately 4m lifts within the waste.

For cells 19/18/17 a ring main will be used in the lowest lift. To mitigate gas escaping through the leachate drainage blanket and under any side slopes, an outer ring main will be placed as close as practical above the drainage blanket approximately 2m from the edge. Each edge of the manifold will be connected to the manifold to ensure maximum suction throughout the pipeline.

The inner pipes runs will be at a height of 2m above the leachate stone.

The pipes will be HDPE perforated pipework welded on site on the horizontal level and solid pipework from the connection to the manifold.

Condensate containment and removal is difficult when using a temporary manifold that is not located within the waste body.

The manifold will have a backfall and a solid pipe will be placed at the lowest end of the pipeline and will return down the side slope to return the condensate to the waste body.

The network will be constructed in progressive lifts following the depth of waste placed.

Each pipe will be controlled by a valve at the manifold. A sampling port on each pipe will facilitate balancing of the field with regard to gas capture. A check on O₂ ingress will be done to ensure that the draw in of air is kept to a minimum.

The horizontal system is intended to be a sacrificial system which will be decommissioned once the permanent cap has been constructed and vertical wells are commissioned.

The treatment of the pipes work leading to the manifold before decommissioning will require cutback as far as practical and termination within the annulus of a vertical well to provide a pathway for any gas that will vent through the redundant pipework.

Permanent Gas Extraction

The permanent vertical wells will be constructed after the placement of the intermediate cover over the area that has been filled to profile height. Once constructed a polypropylene liner. The wells will be attached to a temporary manifold, once permanent capping is undertaken the wells will be connected to the permanent manifold.

A SEW will be lodged with the Agency setting out the engineering details for the proposal. The SEW will included all aspects of the permanent capping.

Gas Destruction

Currently all gas is conveyed to the permanent enclosed flare. The flare has a capacity of 500 m³/hr.

Appendix VI Quantity of leachate removed from NKL to Tralee Wastewater Treatment Plant during the reporting period:

<i>Month</i>	<i>Leachate Volume (m³)</i>	<i>No. of Loads</i>
<i>January</i>	4289.94	140
<i>February</i>	5666.38	183
<i>March</i>	3324.86	107
<i>April</i>	4080.68	131
<i>May</i>	1711.48	55
<i>June</i>	1236.44	40
<i>July</i>	4304.64	140
<i>August</i>	2208.06	71
<i>September</i>	4902.34	158
<i>October</i>	2393.60	220
<i>November</i>	6719.70	220
<i>December</i>	1663.61	54
<i>Total</i>	<i>42,442.73</i>	<i>1,596</i>

Table 10 Leachate Removal from Site 2010

Appendix VII Dust Monitoring Report



OUR REF: RP 2010 / NORTH KERRY LANDFILL / 02 / 03

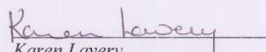
PAGE 1/2

ANALYSIS REPORT

CUSTOMER:	NORTH KERRY LANDFILL	SAMPLE TYPE:	DUST
ADDRESS:	Tralee, County Kerry	CONDITION OF SAMPLE ON RECEIPT:	Satisfactory
REPORT TO:	TARA O' CARROLL Facility Manager	DATE SAMPLED:	13 October ~ 11 November 2010
SAMPLED BY:	Danny O' Leary Southern Scientific Services Ltd	DATE RECEIVED:	11 November 2010
SAMPLING PT:	D1 ~ D4	DATE ANALYSED:	23 ~ 26 November 2010
ORDER NO:	-	DATE REPORTED:	29 November 2010
		WORK NO.:	23998 C 10P-068

TABLE OF RESULTS

METHOD:	LAB REF:	YOUR REF:	TOTAL PARTICULATES mg/m ² /day	INORGANIC PARTICULATES mg/m ² /day
TA Luft VDI 2119	C10-Nov 330	NKL D1	156	102
TA Luft VDI 2119	C10-Nov 331	NKL D2	412	122
TA Luft VDI 2119	C10-Nov 332	NKL D3	109	77
TA Luft VDI 2119	C10-Nov 333	NKL D4	121	82


 Karen Lavery
 Chemistry Laboratory

- * The results relate only to the items tested.
- * The analysis report shall not be reproduced except in full without written approval of the laboratory.

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directors: K. Murphy, M. Murphy & C. Murphy
 registered in ireland no 323196 | vat reg no IE 6343196 M

COMMENT:

C10-Nov 331 ~ D2

The collector gauge contained green coloured water and considerable amount of visible particulates and a large amount of algal growth. During analysis of the sample the dried dish had large amount of green particulates present. The ashed dish had large amount of grey particulates present. The ashed residue underwent no effervescence on addition of acid indicating the absence of carbonate in the residue.

In accordance to standard laboratory practice a blank sample and a QC standard were analysed with the batch of samples.



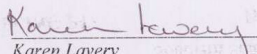


ANALYSIS REPORT

CUSTOMER:	NORTH KERRY LANDFILL	SAMPLE TYPE:	DUST
ADDRESS:	Tralee, County Kerry	CONDITION OF SAMPLE ON RECEIPT:	Satisfactory
REPORT TO:	TARA O' CARROLL Facility Manager	DATE SAMPLED:	14 September ~ 13 October 2010
SAMPLED BY:	Danny O' Leary Southern Scientific Services Ltd	DATE RECEIVED:	13 October 2010
SAMPLING PT:	D1 ~ D4	DATE ANALYSED:	27 October ~ 03 November 2010
ORDER NO:	-	DATE REPORTED:	05 November 2010
		WORK NO.:	23867 C 10P-068

TABLE OF RESULTS

METHOD:	LAB REF:	YOUR REF:	TOTAL PARTICULATES mg/m ² /day	INORGANIC PARTICULATES mg/m ² /day
TA Luft VDI 2119	C10-Oct 219	NKL D1	68	30
TA Luft VDI 2119	C10-Oct 220	NKL D2	249	78
TA Luft VDI 2119	C10-Oct 221	NKL D3	49	17
TA Luft VDI 2119	C10-Oct 222	NKL D4	53	<10


 Karen Lavery
 Chemistry Laboratory

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Appendix VIII Annual Rainfall and True Evaporation:

Month	Rainfall (mm)	True Evaporation (mm)	Effective Rainfall (mm)
January	164.5	97.08	67.42
February	73.5	-39.82	113.32
March	125.9	-39.64	165.54
April	91.4	60.6	30.8
May	51.5	48.96	2.54
June	67.8	84.56	-16.76
July	186.7	42.96	143.74
August	73.8	60.48	13.32
September	171.9	24.97	146.93
October	130	12.16	117.84
November	163.8	165.84	-2.04
December	64.9	99.27	-34.37
Total	1365.7	617.42	748.28

Table 11 Annual Rainfalls and True Evaporation as measured on site

Appendix IX Complaints/Complainants:

No.	Date	Complainant	Address	Nature	Dealt by
1	23 Jan	Jane Reidy	Reamore Kielduff Tralee	Odour	Tara O Carroll
2	25 Jan	Sinead Reidy	Reamore Kielduff Tralee	Odour	Tara O Carroll
3	25 Jan	Noel Keane	keanen@indigo.ie	Odour	Tara O Carroll
4	25 Jan	John Keane	Not given	Odour	Tara O Carroll
5	2 Feb	Mary Jo Walshe	The Kerries Tralee	Noise from Treatment plant Tralee	Tara O Carroll
6	19 Feb	Brendan Loham	3 Manor Park Tralee	Infrastructure	Tara O Carroll
7	27 Feb	James Leen	Reamore Kielduff	Illegal dumping	Tara O Carroll
8	8 Mar	James Leen	Reamore Kielduff	Illegal dumping	Tara O Carroll
9	10 April	James Leen	Reamore Kielduff	Odour	Tara O Carroll
10	29 Apr	James Leen	Reamore Kielduff	Illegal dumping	Tara O Carroll
11	12 May	Tom O Grady	Ballybeggan Tralee	Litter on main road	Tara O Carroll
12	1 June	Patsy Linnehan	Meenginaire Knocknagoshel	Illegal dumping	Tara O Carroll
13	17 Aug	James Leen	Reamore Kielduff	Illegal dumping	Tara O Carroll
14	26 Aug	Noel Keane	keanen@indigo.ie	Odour	Tara O Carroll
15	20 Sept	James Leen	Reamore Kielduff	Illegal dumping	Tara O Carroll
16	20 Sept	Eileen Sheehy	Ivy Bridge Lyrecrompane	Flies	Tara O Carroll
17	10 Nov	Richard Smith	Woodlands Mount Eagle Brosna	Infrastructure	Tara O Carroll
18	17 Nov	David O Regan	Not given	Infrastructure	Tara O Carroll
19	16 Dec	Caroline Markey	The Lab Kerry County Council	Litter on main road	Bill Hickey

Appendix X Physio Chemical Monitoring of North Kerry Landfill

ANNUAL ENVIRONMENT REPORT

Physio-chemical Monitoring of Muingnaminnane Landfill 2010

Prepared by:
David Lenihan
Senior Executive Chemist

06 April 2011

INTRODUCTION

As Part of requirements under EPA Licence for North Kerry landfill this laboratory produces a report on a six monthly basis as well as an annual detailed report. This report can thus be interpreted as *Laboratory contribution to Annual Environment report*. This report effectively also incorporates the *final six monthly report for 2010*

Enclosed are:

- annual results in spreadsheet format for Leachate, Surface Water and Groundwater as required per monitoring provisions as of licence requirements for 2010
- Interpretation of results pertaining to three matrices of concern i.e. Groundwater, Surface water and Leachate
- results from ELS contract laboratory pertaining to individual List 1 and List 2 organics which were analysed for in November at three groundwater locations *App3*
- **trend graphs for Total organic Carbon results and associated conductivity measurements for each of boreholes**
- *Appendix 1* detailing sample locations and associated grid references used in report
- *Table 1* outlines trigger values for strategic parameters analysed in groundwater
- *Appendix 2* details list of List 1,2 Organics monitored and their associated Limits of detection (LODs)
- *Appendix 3* detailed results of List 1/2 organic parameters from ELS
- *Appendix 4* summary of Small stream risk survey (*SSRS*) of stream at station W1 (main impact point of surface waters from Landfill)

Most of analysis was conducted at KCC laboratory.

Analysis on Parameters (*italics and asterix*) was farmed out to ELS laboratories Mahon Industrial Estate, Cork. Parameters analysed by ELS were: , *Cyanide* and *List 1 and List 2 organics*.

A summary of Environmental requirements has been prepared by Tobin Consulting engineers. This is the document we are using. The final round of results for 2010 was taken on the 17th Nov. Results are also included for monthly analysis of groundwater as required by provisions of old licence

In 2010 a total of **166** samples were sampled by KCC Laboratory personnel

Altogether **1495** tests were analysed to satisfy requirements of licence monitoring.

Of these **1470** tests were analysed in KCC laboratory

25 tests were analysed by *ELS laboratories*. The latter included Cyanide and List 1 / 2 organics as required on an annual basis for three groundwater locations It must however be stressed that each test for SVOCs or VOCs comprises analysis for 153 specific compounds

The monitoring locations monitored are as per requirements of new licence.

APPI outlines locations and associated northings and eastings

Trigger limits

Trigger limits are required to be set for certain parameters in groundwater and submitted to EPA. Perhaps the best such limits to use are groundwater threshold values as set out in groundwater regulations 2009. Other standards used, correspond to drinking water regulatory standards. However where drinking water limits cannot be adhered to because of natural conditions (non anthropogenic effects) i.e. Ph the trigger value would have to be more flexible. Accordingly I suggest following as outlined in **Table 1**. I suggest that these be applicable to Boreholes 1 to 4. Borehole 5 appears to be monitoring an aquifer which contains a lot of decaying organic matter more than likely from natural sources. Therefore trigger value for ammonia may be too strict.

Table I Parametric Trigger values for Groundwater

Parameter	units	Trigger value (max)	Trigger value(min)
Ammonium	mg/L	0.225	
Nitrite	mg/L	0.38	
Total Oxidised Nitrogen	mg/L	37.5	
	(NO ₃)		
Conductivity	Us/cm	800	
Ph	Ph units	10	4.5
Dissolved Oxygen	mg/L		1.0
	O ₂		
Chloride	mg/L	200	
Flouride	ug/L	1000	
Sodium	mg/L	150	
Potassium	mg/L	10	
Boron	mg/L	0.75	
Copper	mg/L	1.5	
Cadmium	ug/L	3.75	
Chromium	ug/L	37.5	
Arsenic	ug/L	7.5	

Parameter	units	Trigger value (max)	Trigger value(min)
Lead	ug/L	10	
Nickel	ug/L	15	
Mercury	ug/L	0.75	
Total Cyanide	ug/L	37.5	
<u>VOCs</u>			
Benzene	ug/L	0.75	
1,2 dichloroethane	ug/L	2.25	
Tetra chloroethene and Trichloroethene	ug/L	7.5	
Toluene	ug/L	5	
Phenols	mg/L	0.05	
<u>SVOCs</u>			
Atrazine	ug/L	0.075	
Simazine	ug/L	0.075	
Poly aromatic Hydrocarbons ¹	ug/L	0.075	
Pesticides ^{2,3}	ug/L	0.375	

¹ PAHs measured should include at least benzo(b)Fluoranthene, benzo(k) Fluoranthene, benzo(ghi)perylene, indeno(123-cd)pyrene Fluoranthene detection

² the trigger value applies to each individual pesticide measured.

³ Pesticides include organic insecticides, Organic herbicides, Organic nematocides, organic acaricides, organic algicides, organic rodenticides, organic slimicides, related products (inter alia, growth regulators)

List 1 and List 2 Organics

Under the provisions of monitoring requirements we are required to monitor List 1 and List 2 organic compounds in three groundwater locations on an annual basis. These locations have to be agreed with EPA. In this report we report on three groundwater locations which were monitored for these compounds

The compounds analysed comprised of two types Volatile Organic compounds (*VOCs*) and Semi Volatile organic compounds (*SVOCs*) . VOCs comprise of organic compounds with boiling points close to or less than that of Water i.e. *Petroleum products* and common solvents –up to 83 compounds were screened for using Purge and Trap GC MS.

Semi Volatile compounds comprise of higher boiling point organics and comprise of classes of compounds such as *pesticides, herbicides, PCBs (polychlorinated Biphenyls)* and *PAHs (Poly aromatic Hydrocarbons)* .Up to 63 different compounds in this category were screened for. A list of these compounds, together with limits of detection is given in

Appendix 2

Of the 83 VOCs analysed only two were detected above their respective Limits of detection *Hexachlorobutadiene* was found at level of 1.5 ug/L in *Borehole No 2*. *Chloroform* was found in *Borehole no 3* (3.4 ug/l). These levels are miniscule and are not of significance

No SVOCs were detected in any of samples .

As we possess and use *ICP-MS instrument we monitored many more locations for heavy metals than were strictly required i.e. 11 surface water, 6 Leachate, and 7 groundwater locations

* Inductively coupled Plasma Mass spectrometer

INTERPRETATION OF RESULTS

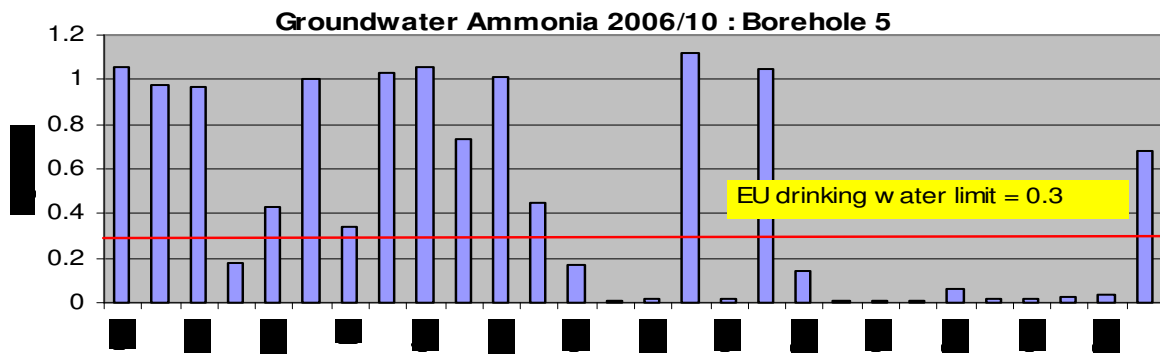
Groundwater:

The quality of groundwater in 2010 for Boreholes 1 – 4 and 6 was satisfactory. Two new boreholes were commissioned in 2010. A replacement for Borehole 1 was constructed due to works on roadway necessitating removal of existing borehole. A new borehole, Borehole No 6, was also commissioned and tested on last two sampling occasions.

Ammonia levels were detected in Borehole 5, though at much reduced levels compared with earlier years

. See Fig 1.

Fig 1

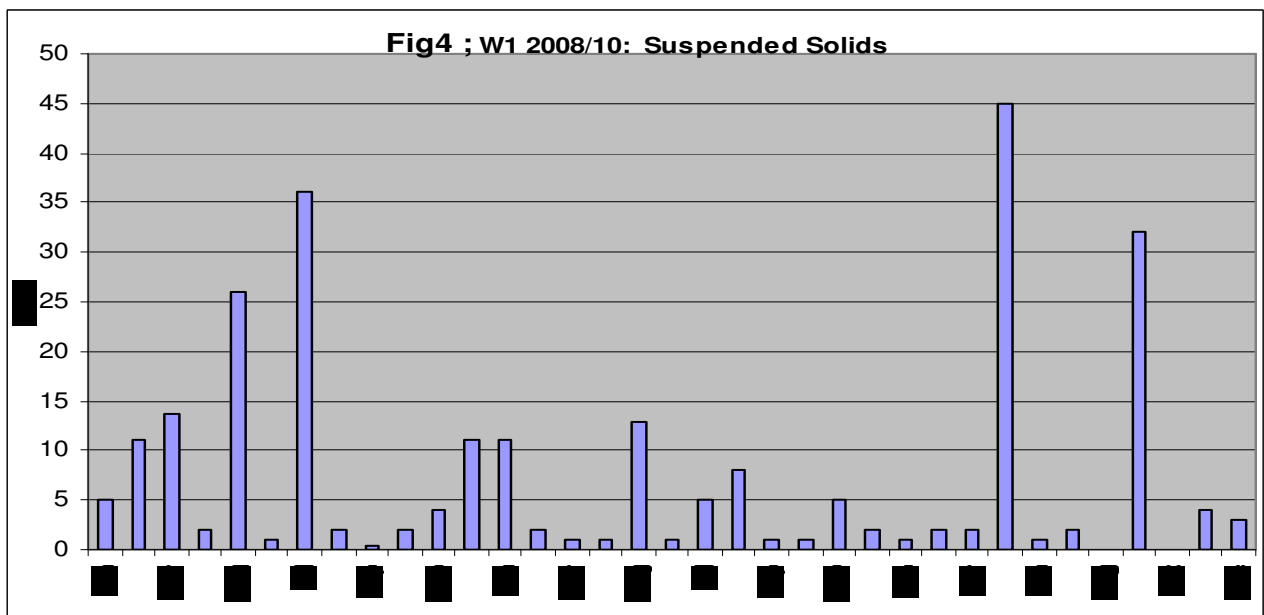
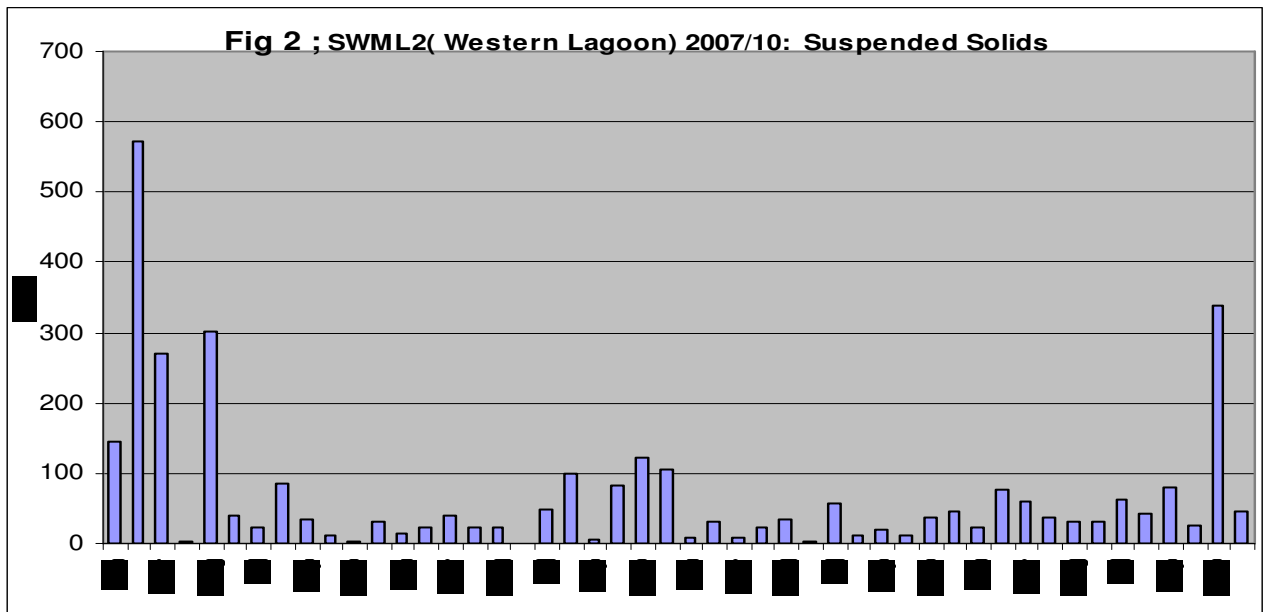


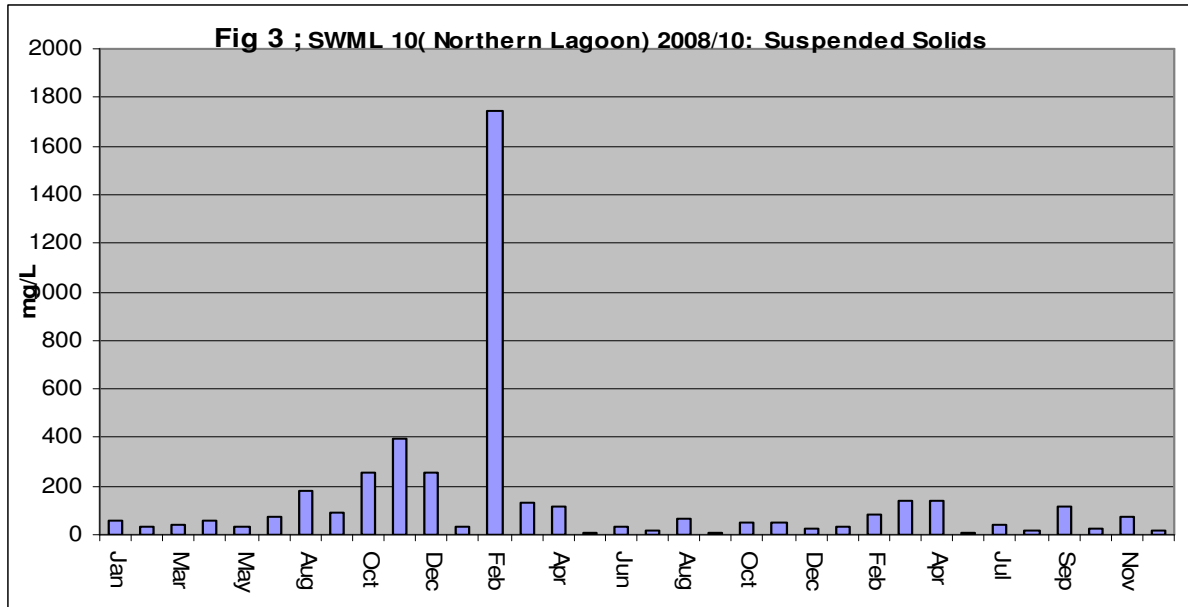
This may have been due to spread of salt, during two cold spells on roads adjacent to borehole in 2010. However it must be reiterated that quality is still satisfactory . Further investigation is been undertaken i.e. increased chloride and conductivity monitoring.

Surface water:

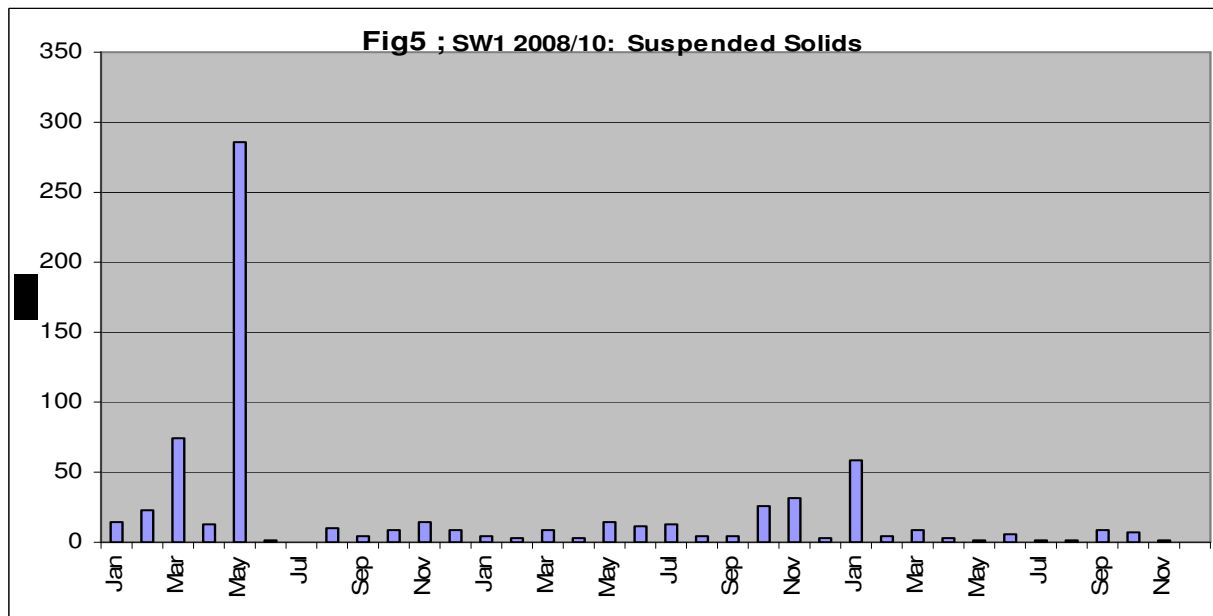
Results from monitoring over last 10 years indicates that most significant threat or impact from Landfill activities in surrounding waters is suspended solids

Samples were obtained “in site monitoring” from Stations **SWML 1,2,3,4,5,10,11 and 12** which are located in perimeter drains draining landfill. Monitoring of Stations 6,7,8 and 9 have ceased as they have been infilled as a result of site works. There was a noticeable increase in suspended solids in receiving waters at W1 during 2010. See Fig 4 Suspended solids @ W1 2008/2010. This despite the fact that 2010 was the driest year in period 2007 to 2010.





There was also much less significant impact from Suspended Solids on off site SW1 See Fig 5 Suspended solids @ sW1 2007/2009



High suspended solids in river waters may impair fish spawning grounds particularly in winter and spring. Occasional pulses of suspended matter entering these sites are more than likely the main contributory factor for unsatisfactory biological quality at this site. Ecological assessment of *W1* In 2007 denotes a Q3 value (moderate pollution), which still reflects some impact. Further assessment, as part of river basin Small stream risk survey(SSRS, of this site in 2009 denoted a stream at risk . See app 4

Because of importance and significance of Suspended solids monitoring of both *W1* and *SW1* are at a much higher frequency for this parameter than license obligations

Impact of Ammonia levels on receiving waters

Throughout most of 2010 there was negligible levels of Ammonia detected at main receiving water site W1. However this changed in December with a dramatic level of 0.62 mg/l NH₄ detected.

Table 2 below shows Ammonia levels in 3 on site surface water drains as well as in W1 from period Nov 2010 to Jan 2011 and compares them with 7 year median levels for same stations

Table 2: Ammonium levels (mg/l NH₄) in surface water landfill sites				
	SWML5	SWML4	SWML2 (lagoon)	W1
7 year median	0.045	0.04	0.03	< 0.02
17/11/2010	< 0.02	< 0.02	< 0.02	< 0.02
06/12/2010	19.4	15.1	64	0.62
15/12/2010	5.14	11	60.8	0.07
17/01/2011	5.48		0.61	

Samples taken in December starting on 6th showed very high levels of Ammonia in drain, lagoon and impact site **W1** above normal levels i.e. 19.4 mg/L at **SWML5** 15.1 mg/l at **SWML4** 64 mg/l at **SWML2 (lagoon)** and 0.62 at surface water impact site (w1). These were significantly above respective 7 year median values for these sites i.e. 0.045 mg/l (**SWML 5**), 0.04 mg/l (**SWML4**), 0.03(**lagoon**) and < 0.02 mg/l (**W1**)

Indeed the levels experienced at sites on drain were the highest ever recorded and denote significant contamination .

Lower results were noted on 15th although still quiet high . Decline in contamination was then noted on subsequent days.

The Ammonia level experienced at impact site **W1 (0.62)** was the highest there in at least 5 years and indicates definite evidence of pollution. To put this in context the recent surface water regulations specify that annual average for Ammonia in a surface water of good status should not exceed 0.083 mg/l (as NH₄) or a 95% percentile value of 0.18mg/L(as NH₄)

Results for this site show that in 2010 **W1** did not achieve good status as far as Ammonia levels were concerned i.e. average of 0.123 mg/L and 95% percentile of 0.48mg/L

Ponding of liquid close to SWML5

Further investigation revealed ponding of liquid on outside of landfill perimeter close to SWML 5. Analysis of this liquid showed high levels of ammonia (**5.65 mg/l NH₄**) consistent with presence of leachate

In conclusion analysis denotes significant contamination at drain flowing into lagoon as well as corresponding impact on surface waters downstream of lagoon.

No significant Ammonia levels at other impact site **SWI** were detected in 2010 .

Leachate results

Leachate was detected in all detection manholes for Cells 1 and 2 i.e. **LD1** and **LD2**. A slight impact on **LD3** was also noted relative to earlier years

Conclusion

- *No significant impact was noted on groundwater sites BH1,23,4 and 6 which would compromise water quality. Contamination is noted in BH5 following previous trends. An increase in conductivity coupled with increase in chloride levels was noted in BH2*
- *Evidence of siltation was evident in sites W1 and SW1 (headwaters of Lee and Smeralagh)*
- *There were significantly elevated levels of Ammonia noted in main receiving water impact site W1*
- *Evidence of leachate was detected in all three leachate detection manholes*

References:

1. *Summary of Environmental Monitoring requirements For- Kerry Co Council Landfill, Muingnaminnane, Tralee, Co Kerry -Waste Licence Ref No: 1-3: Tobin Consulting Engineers*
2. *Biological Invertebrate Monitoring of Surface Waters 2007; Laboratory KCC*

Appendix1: Details Sampling points referred to in report

<u>Location</u>	<u>comments</u>	<u>old or alternative name</u>	<u>Location Easting</u>	<u>Location Northing</u>
<u>Groundwater</u>				
<u>specified groundwater monitoring pts</u>				
Groundwater - BH-1			94697	117360
Groundwater - BH-2			94814	117306
Groundwater - BH-3			94808	117005
Groundwater - BH-4			95430	117040
Groundwater - BH-5			94917.5	117152.7
Groundwater - BH-6	New borehole- not in license		94933.9	117565
<u>Private boreholes adjacent to landfill</u>				
borehole: Dennis O Mahony	not specified in new licence		97390.7	118348.7
borehole: Gerry Sugrue	not specified in new licence		93037.8	116489.5
<u>Leachate</u>				
<u>Detection manholes</u>				
LD-1		leachate detection manhole 1	94909	117268
LD-2		leachate detection manhole 2	94894	117298
LD-3		leachate detection manhole from lagoon	94905	117264
<u>Lagoon sampling pts</u>				
LL-1		Leachate in lagoon 1	94904	117237
LL-2		leachate in Lagoon 2	94927	117166
LL-3		lagoon containing run off from compost	94979	117414
<u>Ancillary pts</u>				
Puraflo Treatment Inlet	not specified in new licence			
Puraflo Treatment Outlet	not specified in new licence		94867.2	117332
Wheelwash	Not specified in new licence			
<u>Surface water</u>				
<u>Off site sampling pts</u>				
Surface Water sampling point: W1	not specified in new licence	biological station	94493.3	117107.5
Surface water sampling point: E2	Not specified in new licence	O'Learys farm	95870.6	116575.6
Surface water sampling point: W2	Not specified in new licence		94493.3	117159.9
SW-1		previously E1	95471	117077
SW-2			95143.6	117969.4
SW-3			94853	118263
<u>On site sampling pts</u>				
SWML-1		previously 1	94948.3	117376.4
SWML-2		previously 2	94837.9	117263.7
SWML-3			94866	117221
SWML-4		previously 4	94883.9	117092.6
SWML-5			94911	117027
SWML-6			95009	117040
SWML-7			95131	117231
SWML-8			95110	117335
SWML-9			95102	117429
SWML-10			95092	117470
SWML-11		previously 11	95067	117520
SWML-12			94958	117384

APPENDIX 2 ; LIST 1, 2 Organics

SVOCs: (Semi Volatile base Neutrals) Std Method 6410 B
Liquid-Liquid Extraction GC/MS.

<u>Parameter</u>	<u>limit of detection</u>	<u>units</u>
1,3 - Dichlorobenzene	1	ug/l
1,4 - Dichlorobenzene	1	ug/l
Hexachloroethane	1	ug/l
bis(2-Chloroethyl) ether	1	ug/l
1,2-Dichlorobenzene	1	ug/l
bis(2-Chloroisopropyl) ether	1	ug/l
N-Nitrosodi-n-propylamine	1	ug/l
Nitrobenzene	1	ug/l
Hexachlorobutadiene	1	ug/l
1,2,4-Trichlorobenzene	1	ug/l
Isophorone	1	ug/l
Naphthalene	1	ug/l
bis(2-Chlororthoxy) methane	1	ug/l
Hexachlorocyclopentadiene	1	ug/l
2-Chloronaphthalene	1	ug/l
Acenaphthylene	1	ug/l
Acenaphthene	1	ug/l
Dimethyl phthalate	1	ug/l
2,6-Dinitrotoluene	1	ug/l
Fluorene	1	ug/l
4-Chlorophenyl phenyl ether	1	ug/l
2,4-Dinitrotoluene	1	ug/l
Diethyl phthalate	1	ug/l
N-Nitrosodiphenylamine	1	ug/l
Hexachlorobenzene	1	ug/l
a-BHC	1	ug/l
4-Bromophenyl phenyl ether	1	ug/l
y-BHC	1	ug/l
Phenanthrene	1	ug/l
Anthracene	1	ug/l
B-BHC	1	ug/l
Heptachlor	1	ug/l
d-BHC	1	ug/l
Aldrin	1	ug/l
Dibutyl phthalate	1	ug/l
Heptachlor epoxide	1	ug/l
Endosulfan I	1	ug/l
Fluoranthene	1	ug/l
Dieldrin	1	ug/l
4,4'-DDE	1	ug/l
Pyrene	1	ug/l
Endrin	1	ug/l
Endosulfan II	1	ug/l

VOCs : Std Method 6210 D-Purge and Trap Capillary
Column GCMS.Screening per USEPA 524.2 list.

<u>Parameter</u>	<u>limit of detection</u>	<u>units</u>
Dichlorodifluoromethane	10.0	ug/l
Chloromethane	0.5	ug/l
Ethyl Chloride/Chloroethane	0.5	ug/l
Vinyl Chloride/Chloroethene *(0.5ppb)	0.5	ug/l
Vinyl Chloride/Chloroethene * (25ppb)	0.5	ug/l
Bromomethane	0.5	ug/l
Trichloromonofluoromethane	0.5	ug/l
Ethyl Ether/Diethyl Ether	0.5	ug/l
11 Dichloroethene	0.5	ug/l
Acetone	2.0	ug/l
Iodomethane/Methyl Iodide	0.5	ug/l
Carbon Disulphide	0.5	ug/l
Allyl Chloride	0.5	ug/l
Methylene Chloride/DCM	5.0	ug/l
2-Propenenitrile/Acrylonitrile	2.0	ug/l
Chloroacetonitrile	0.5	ug/l
Nitrobenzene	0.5	ug/l
Propanenitrile	10.0	ug/l
Hexachlorobutadiene	0.5	ug/l
Trans-1,2 Dichloroethene	0.5	ug/l
MtBE	0.5	ug/l
11 Dichloroethane	0.5	ug/l
22 Dichloropropane	0.5	ug/l
cis-12 Dichloroethene	0.5	ug/l
2-Butanone	5.0	ug/l
Methyl Acrylate	5.0	ug/l
Bromochloromethane	0.5	ug/l
Methacrylonitrile	5.0	ug/l
Tetrahydrofuran	5.0	ug/l
Chloroform*	1.0	ug/l
111 Trichloroethane	0.5	ug/l
1-Chlorobutane	0.5	ug/l
Carbon Tetrachloride	0.5	ug/l
11 Dichloropropene	0.5	ug/l
Benzene	0.1	ug/l
12 Dichloroethane)	0.1	ug/l
Trichloroethylene/ Trichloroethene	0.1	ug/l
12 Dichloropropane	0.5	ug/l
Dibromomethane	0.5	ug/l
Methyl Methacrylate	0.5	ug/l
Bromodichloromethane*	2.0	ug/l
13 Dichloropropene,cis	2.0	ug/l
MIBK/4 Methyl 2 Pentanone	2.0	ug/l

App 4: results of Small streams risk Survey of W1

The Small Streams Risk Score (SSRS) is a biological risk assessment system for detecting potential sources of pollution in rivers and is usually carried out on first and second order streams. It was developed by the Environmental Protection Agency (EPA) in association with Western River Basin District (WRBD). The SSRS is of particular value in detecting hard to find diffuse within catchments. The basic principle of the SSRS is that aquatic insects and other invertebrates living in streams have varying sensitivities to pollution and therefore, can be used as continuous monitors of water quality. This method was devised to describe the status of a stream with the score indicating the probability of risk as follows:

- >8.0 = Probably not at risk.
- 6.5-8.0 = Probably at risk.
- <6.5 = At risk

On 8 April 2009 an SSRS was carried out at W1 Biological Station for the landfill. It scored 6.4 which means it is deemed 'At Risk'.

ADDENDUM TO AER (Laboratory input)

Status of W1 in 2011-05-06

Three samples have been taken in months Jan to April from impact site –all are of good quality (ammonium levels less than 0.04 mg/L) which indicates that situation experienced in dec 2010 has greatly improved

David Lenihan

Appendix XI – PRTR 2010

Sheet : Facility ID Activities

AER Returns Workbook

13/5/2011 14:37



Environmental Protection Agency

| PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2010(1).xls | Return Year : 2010 |

[Guidance to completing the PRTR workbook](#)

AER Returns Workbook

Version 1.1.12

REFERENCE YEAR	2010
-----------------------	------

1. FACILITY IDENTIFICATION

Parent Company Name	Kerry County Council
Facility Name	North Kerry Landfill Site
PRTR Identification Number	W0001
Licence Number	W0001-04

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.2	Land treatment, including biodegradation of liquid or sludge discards in soils.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.
3.7	#####
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.
Address 1	Muingnaminnane
Address 2	Tralee
Address 3	Co. Kerry

Sheet : Facility ID Activities

AER Returns Workbook

13/5/2011 14:37

Address 4	
Country	Ireland
Coordinates of Location	-6.85099 54.1736
River Basin District	GBNIIENB
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Tara O Carroll
AER Returns Contact Email Address	tara.mccarthy@kerrycoco.ie
AER Returns Contact Position	Former Landfill Manager 2010
AER Returns Contact Telephone Number	066 7162020
AER Returns Contact Mobile Phone Number	087 912 9535
AER Returns Contact Fax Number	066 71 62001
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	2188
Number of Employees	9
User Feedback/Comments	Transfer and Treatment of waste already submitted as part of EPA Landfill treatment survey is it necessary for the double reporting of this info to the Agency?
Web Address	www.kerrycoco.ie

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(d)	Landfills
5(c)	Installations for the disposal of non-hazardous waste
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

13/05/2011 14:38

AER Returns Workbook

Sheet: Releases to Waters

15/03/2011 11:39

| PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2010(1).xls | Return Year : 2010

Link to previous years emissions data

4.2 RELEASES TO WATERS

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

No. Annex II	POLLUTANT	Name	M/C/E	Method Code	Method Used Designation or Description	QUANTITY		
						T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
79	Chlorides (as Cl)		E	ESTIMATE		0.973737333	0.0	0.0
18	Cadmium and compounds (as Cd)		E	ESTIMATE		0.00001834	0.0	0.0
19	Chromium and compounds (as Cr)		E	ESTIMATE		0.0000356	0.0	0.0
24	Zinc and compounds (as Zn)		E	ESTIMATE		0.00004768	0.0	0.0
22	Nickel and compounds (as Ni)		E	ESTIMATE		0.0000436	0.0	0.0
23	Lead and compounds (as Pb)		E	ESTIMATE		0.0000504	0.0	0.0
20	Copper and compounds (as Cu)		E	ESTIMATE		0.00000209	0.0	0.0
21	Mercury and compounds (as Hg)		E	ESTIMATE		0.04466318	0.0	0.0
12	Total Phosphate		E	ESTIMATE		0.04466318	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B). Then click the delete button.

SECTION B : REMAINING PRTR POLLUTANTS

POLLUTANT		Name		Method Used Designation or Description		QUANTITY		
No. Annex II				M/C/E	Method Code	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
						0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B). Then click the delete button.

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

Pollutant No.	POLLUTANT	Name	M/C/E	Method Code	Method Used Designation or Description	QUANTITY		
						T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
239	Ammonia (as N)		E	ESTIMATE		0.113195961	0.0	0.0
303	BOD		E	ESTIMATE		0.04982743	0.0	0.0
305	COD		E	ESTIMATE		0.92727453	0.0	0.0
240	Suspended Solids		E	ESTIMATE		1.073632297	0.0	0.0
338	Potassium		E	ESTIMATE		0.030668336	0.0	0.0
374	Boron		E	ESTIMATE		0.000213165	0.0	0.0
341	Sodium		E	ESTIMATE		0.243979055	0.0	0.0
357	Iron		E	ESTIMATE		0.044701353	0.0	0.0
305	Calcium		E	ESTIMATE		0.594116545	0.0	0.0
320	Magnesium		E	ESTIMATE		0.08140374	0.0	0.0
343	Sulphate		E	ESTIMATE		0.2623408	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B). Then click the delete button.

13/05/2011 14:38

AER Returns Workbook

Sheet: Releases to Wastewater or Sewer

Link to previous years emissions data

Link to previous years emissions data

4.3 RELEASES TO WASTEWATER OR SEWER

SECTION A: PRTR POLLUTANTS

No. Annex 8	Name	POLLUTANT	M/C/E	METHOD		Please enter all quantities in this section in KGs			QUANTITY		
				Method Code	Designation or Description	Emission Point 1	Emission Point 2	T (Total)	A (Accidental)	F (Fugitive)	
76	Ammonia (NH3)		C	ESTIMATE		16869.87	0.0	16869.87	0.0	0.0	0.0
77	Chlorides (as Cl)		C	ESTIMATE		3154.91	0.0	3154.91	0.0	0.0	0.0
78	Total organic carbon (TOC) (as total C or COD)		C	ESTIMATE		11236.1	0.0	11236.1	0.0	0.0	0.0
79	Chromium and compounds (as Cr)		C	ESTIMATE		0.0	0.0	0.0	0.0	0.0	0.0
18	Cadmium and compounds (as Cd)		C	ESTIMATE		1.020658	0.0	1.020658	0.0	0.0	0.0
24	Zinc and compounds (as Zn)		C	ESTIMATE		4.032059	0.0	4.032059	0.0	0.0	0.0
22	Nickel and compounds (as Ni)		C	ESTIMATE		0.850856	0.0	0.850856	0.0	0.0	0.0
23	Lead and compounds (as Pb)		C	ESTIMATE		0.140874	0.0	0.140874	0.0	0.0	0.0
20	Copper and compounds (as Cu)		C	ESTIMATE		1.106885	0.0	1.106885	0.0	0.0	0.0
21	Mercury and compounds (as Hg)		C	ESTIMATE		0.000382	0.0	0.000382	0.0	0.0	0.0
82	Cyanides (as total CN)		C	ESTIMATE		2.207022	0.0	2.207022	0.0	0.0	0.0
83	Fluorides (as total F)		C	ESTIMATE		6.486546	0.0	6.486546	0.0	0.0	0.0

*Click a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B: REMAINING POLLUTANT EMISSIONS (as required by Annex 10)

Pollutant No.	Name	POLLUTANT	M/C/E	METHOD		Please enter all quantities in this section in KGs			QUANTITY		
				Method Code	Designation or Description	Emission Point 1	Emission Point 2	T (Total)	A (Accidental)	F (Fugitive)	
303	BOD		C	ESTIMATE		2626.897	0.0	2626.897	0.0	0.0	0.0
306	COD		C	ESTIMATE		24580.91	0.0	24580.91	0.0	0.0	0.0
330	Suspended Solids		C	ESTIMATE		1237.913	0.0	1237.913	0.0	0.0	0.0
338	Phosphorus		C	ESTIMATE		3718.126	0.0	3718.126	0.0	0.0	0.0
374	Boron		C	ESTIMATE		11.36587	0.0	11.36587	0.0	0.0	0.0
341	Sodium		C	ESTIMATE		5665.326	0.0	5665.326	0.0	0.0	0.0
357	Iron		C	ESTIMATE		178.774	0.0	178.774	0.0	0.0	0.0
305	Calcium		C	ESTIMATE		2000.253	0.0	2000.253	0.0	0.0	0.0
320	Magnesium		C	ESTIMATE		865.4215	0.0	865.4215	0.0	0.0	0.0
321	Manganese (as Mn)		C	ESTIMATE		65.17081	0.0	65.17081	0.0	0.0	0.0
343	Sulphate		C	ESTIMATE		1160.885	0.0	1160.885	0.0	0.0	0.0
388	Molybdenum		C	ESTIMATE		36.20024	0.0	36.20024	0.0	0.0	0.0

*Click a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Link to previous years emissions data

Page 1 of 1

4.4 RELEASES TO LAND

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND		METHOD		Please enter all quantities in this section in KGs	
POLLUTANT	M/C/E	Method Used	Designation or Description	T (Total) KG/Year	A (Accidental) KG/Year
No. Annex II		Method Code		0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND		METHOD		Please enter all quantities in this section in KGs	
POLLUTANT	M/C/E	Method Used	Designation or Description	T (Total) KG/Year	A (Accidental) KG/Year
Pollutant No.		Method Code		0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Transfer Destination	European Waste Code	Quantity (Tons per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Licence/Parent No. and Address of Facility (HAZARDOUS WASTE ONLY)	Site Details - Address of Facility (HAZARDOUS WASTE ONLY)
					M/C/E	Method Used			
Within the Country	19 07 03	42442.75	landfill leachate other than those mentioned in 19 07 02	D6	M	Weighted	Offsite in Ireland	Frucane Bulks Recycling, WCP-DC-08-09-0951-Kerris, Tralee Co. Kerry, Ireland	Trade Wastewater Treatment Plant, The Kerries, Tralee Co. Kerry, Ireland
Within the Country	20 03 01	26.08	mixed municipal waste	R3	M	Weighted	Offsite in Ireland	Dillon Waste, The Kerries, Tralee, Ireland	Dillon Waste, The Kerries, Tralee, Ireland
Within the Country	15 01 01	138.0	paper and cardboard packaging	R3	M	Weighted	Offsite in Ireland	Dillon Waste, WCP-LK-08-0077-04 Kerry, Ireland	Dillon Waste, The Kerries, Tralee, Co Kerry, Ireland
Within the Country	15 01 07	33.35	glass packaging	R3	M	Weighted	Offsite in Ireland	Rehab Glasco Recycling, WCP-DC-08-1150-01	Unit 4 Obstruction Business Park, Carragh Road, Naas Co. Kildare, Ireland
Within the Country	20 01 40	5.9	metals	R4	M	Weighted	Offsite in Ireland	Rehab Glasco Recycling, WCP-DC-08-1150-01	Unit 4 Obstruction Business Park, Carragh Road, Naas Co. Kildare, Ireland
Within the Country	20 01 40	165.1	metals	R4	M	Weighted	Offsite in Ireland	Hegarty Metal Processing, WCP-LK-027-02	Ballymore Road, Limerick City, Co. Limerick, Ireland
Within the Country	20 01 39	18.5	plastics	R4	M	Weighted	Offsite in Ireland	Dillon Waste, WCP-LK-08-0077-04 Kerry, Ireland	Dillon Waste, The Kerries, Tralee, Co Kerry, Ireland
To Other Countries	20 01 11	21.53	textiles	R3	M	Weighted	Offsite in Ireland	Recyclers, ROC 1829 WMEZ	road, Randsdabom, Co Antrim, United Kingdom
Within the Country	20 02 01	499.94	biodegradable waste	R3	M	Weighted	Offsite in Ireland	Boet Na Mona, WD198-01	Kilberry, Co. Kildare, Ireland
To Other Countries	16 06 01	7.27	lead batteries	R7	M	Weighted	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium
To Other Countries	16 06 02	1.18	Hc-Cd batteries	R7	M	Weighted	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium
To Other Countries	13 02 05	4.0	mineral-based non-chlorinated engine, gear and lubricating oils	R9	C	Volume Calculation	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium
Within the Country	13 08 99	0.86	wastes not otherwise specified	R9	C	Volume Calculation	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium
To Other Countries	14 06 01	2.28	chlorofluorocarbons, HCFC, HFC	R7	C	Volume Calculation	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium
To Other Countries	14 06 03	2.67	other solvents and solvent mixtures	R7	C	Volume Calculation	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium
Within the Country	20 01 25	0.25	petroleum oil and fat	R8	C	Volume Calculation	Offsite in Ireland	Buckley ECO Fuels, WCP-LK-85-076	Kilbarney, Kerry, Ireland
To Other Countries	15 01 10	2.67	packaging containing residues of or contaminated by dangerous substances	R7	C	Volume Calculation	Abroad	Enva Ireland, WCP-LK-052/064	Enva, Campine, M.LVA105-173/lyda, Belgium

* Select a row by double-clicking the Description of Waste then click the delete button.

Appendix XII – BMW Quarterly Results 2010.

Biodegradable Municipal Waste Reporting Landfill Submission Report

Waste licence number: W0001-04 North Kerry Landfill Site

Report created on: 18/10/2010 11:40

Submission details

Year: 2010 Quarter: 3
Reporting period: July - September
Reference number: R-W0001-2010-3

Site details

License number: W0001-04
Parent company name: Kerry County Council
Facility name: North Kerry Landfill Site
Facility address: Muingnaminnane, Tralee, Co. Kerry,

Contact details of person who made the return

Contact name: Tara O'Carroll Contact position: Landfill Manager
Email address: tara.mccarthy@kerrycoco.ie Telephone number: 0667186799
Mobile number: 0879129535 Fax number: 0667129195

BMW details

Summary for Q3 2010

Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
2-bin residual household waste	1743.25	EPA Approved factor	0.63	1098.25		63.00
3-bin residual household waste	143.08	EPA Approved factor	0.47	67.25		47.00
2-bin residual commercial waste	82.56	EPA Approved factor	0.75	61.92		75
3-bin residual commercial waste	1.7	EPA Approved factor	0.68	1.16		68.24
Untreated MSW skip waste	20.82	EPA Approved factor	0.33	6.87		33.00
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	285.62	EPA Approved factor	0.65	172.65		65.00
Residual MSW from civic amenity facility	344.94	EPA Approved factor	0.63	217.31		63.00
Other	34.64	Site Specific factor	0.00	0.00	Non Organic waste to landfill	0
Other	421.38	Site Specific factor	0.63	265.47	Caherciveen Transfer Station	63.00
Other	76.7	Site Specific factor	0.63	48.32	Dingle Civic Amenity Site	63.00
Other	347.64	Site Specific factor	0.65	225.97	Kenmare Transfer Station	65.00
Other	981.88	Site Specific factor	0.56	549.85	Coolcaslagh Transfer Station	56.00

Other	849.98	Site Specific factor	0.65	552.49	Milltown Transfer Station	65.00
	5314.19			3267.51		61.49

Cumulative report for year

Quarter	Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
Q3	2-bin residual household waste	1743.25	EPA Approved factor	0.63	1098.25		63.00
Q3	3-bin residual household waste	143.08	EPA Approved factor	0.47	67.25		47.00
Q3	2-bin residual commercial waste	82.56	EPA Approved factor	0.75	61.92		75.00
Q3	3-bin residual commercial waste	1.70	EPA Approved factor	0.68	1.16		68.24
Q3	Untreated MSW skip waste	20.82	EPA Approved factor	0.33	6.87		33.00
Q3	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	265.62	EPA Approved factor	0.65	172.65		65.00
Q3	Residual MSW from civic amenity facility	344.94	EPA Approved factor	0.63	217.31		63.00
Q3	Other	34.64	Site Specific factor	0.00	0.00	Non Organic waste to landfill	0.00
Q3	Other	421.38	Site Specific factor	0.63	265.47	Caherciveen Transfer Station	63.00
Q3	Other	76.70	Site Specific factor	0.63	48.32	Dingle Civic Amenity Site	63.00
Q3	Other	347.64	Site Specific factor	0.65	225.97	Kenmare Transfer Station	65.00
Q3	Other	981.88	Site Specific factor	0.56	549.85	Coolcaslagh Transfer Station	56.00
Q3	Other	849.98	Site Specific factor	0.65	552.49	Milltown Transfer Station	65.00
		5314.19			3267.51		61.49

These figures are as reported by the licensee to the Agency and have not been validated by the EPA

Biodegradable Municipal Waste Reporting Landfill Submission Report

Waste licence number: W0001-04 North Kerry Landfill Site

Report created on: 18/04/2011 13:06

Submission details

Year: 2011 Quarter: 1
 Reporting period: January - March
 Reference number: R-W0001-2011-1

Site details

License number: W0001-04
 Parent company name: Kerry County Council
 Facility name: North Kerry Landfill Site
 Facility address: Muingnaminnane, Tralee, Co. Kerry,

Contact details of person who made the return

Contact name: Patrick Phelan Contact position: Landfill Manager
 Email address: pphelan@kerrycoco.ie Telephone number: 0667129195
 Mobile number: 0877801369 Fax number: 0667186799

BMW details

Summary for Q1 2011

Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
2-bin residual commercial waste	91.62	EPA Approved factor	0.75	68.72		75.01
2-bin residual household waste	1519.94	EPA Approved factor	0.63	957.56		63.00
3-bin residual household waste	129.98	EPA Approved factor	0.47	61.09		47.00
Other	284.06	Site Specific factor	0.64	181.80	Caherciveen TS	64.00
Other	960.86	Site Specific factor	0.59	566.91	Coolcashlugh	59.00
Other	48.3	Site Specific factor	0.63	30.43	Dingle CA	63.00
Other	275.66	Site Specific factor	0.66	181.94	Kenmare TS	66.00
Other	614.48	Site Specific factor	0.64	393.27	Milltown TS	64.00
Other	2	Site Specific factor	0.00	0.00	Graveyard Waste	0
Residual MSW from civic amenity facility	232.34	EPA Approved factor	0.63	146.37		63.00
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	476.37	EPA Approved factor	0.65	309.64		65.00
	4635.61			2897.73		62.51

Cumulative report for year

Quarter	Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
Q1	2-bin residual commercial waste	91.62	EPA Approved factor	0.75	68.72		75.01
Q1	2-bin residual household waste	1519.94	EPA Approved factor	0.63	957.56		63.00
Q1	3-bin residual household waste	129.98	EPA Approved factor	0.47	61.09		47.00
Q1	Other	284.06	Site Specific factor	0.64	181.80	Caheroiveen TS	64.00
Q1	Other	960.86	Site Specific factor	0.59	566.91	Coolcashlagh	59.00
Q1	Other	48.30	Site Specific factor	0.63	30.43	Dingle CA	63.00
Q1	Other	275.66	Site Specific factor	0.66	181.94	Kenmare TS	66.00
Q1	Other	614.48	Site Specific factor	0.64	393.27	Milltown TS	64.00
Q1	Other	2.00	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q1	Residual MSW from civic amenity facility	232.34	EPA Approved factor	0.63	146.37		63.00
Q1	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	476.37	EPA Approved factor	0.65	309.64		65.00
		4635.61			2897.73		62.51

These figures are as reported by the licensee to the Agency and have not been validated by the EPA

Box 3

Detail any loans associated with the acquisition, setting-up, development or operation of the facility.

In each case detail the:

- Reason for the loan
- Total value of the loan
- Amount repaid at start of this year
- Annual schedule of repayments
- Remaining duration of the loan

Loan 1 – Purchase of land for extension of the landfill site - €1.3 million, drawn down in 2008
 Amount repaid in 2009 = €126,200. Annual schedule repayments – bi annual @ €126,200 p/a
 8.5 years remaining.

Loan 2 – Purchase of land for an extension of the landfill site - €1.3m, drawn down in 2007.
 Amount repaid in 2009 = €155,600. Annual schedule of repayment – Bi annual repayment
 At €155,600 p/a. 8 years remaining

Loan 3 – Landfill extension development costs - €2.5m, drawn down 2008. Amount repaid in
 2009 = €177,400. Annual Schedule repayments – Bi annual repayments @ €177,400 p/a
 14 years remaining.

Loan 4 – Landfill development – amount repaid in 2009 = €41,700. Annual schedule of
 Repayments – Bi annual repayments estimated at €nil p/a. 0 years remaining

Box 4

Estimated costs, during a period of not less than 30 years or such greater period as may be prescribed, of the closure, restoration, remediation or aftercare of the facility

€7,600,000

Source of estimated costs: Restoration and Aftercare Plan submitted by KCC to EPA in August 2009

Detail the status of and arrangements in place to cover the above costs.

For example, a fund covering these costs fully may be in place or there may be an arrangement to pay into an annually accruing fund in which case the current value of the fund and the schedule of payments should be detailed.

€7.6m

Assumption that area 1(cells 1-16) is closed and that Extension developed but not utilised

The annual budget process provides an annual Contribution to landfill cell development

Box 5		
	Income (€)	Expenditure (€)
Total income from waste intake this year (excluding landfill levy)	4,436,000	
Amount paid this year to service any loans associated with the acquisition, setting-up, development or operation of the facility		634,500
Amount paid this year to contribute to closure, restoration, remediation or aftercare costs		1,500,000
Nett operational and infrastructure costs this year¹		1,601,000
<i>Do not include costs already covered under loans above.</i>		
Income – Expenditure	€ 700,500	
Balance carried forward from previous years	€2,700,000	
Balance carried forward to next year	€3,400,500	

¹ For example, costs such as payroll, provision of daily and intermediate cover, provision of lined cells, leachate and gas management, capping cells, environmental monitoring, environmental insurance, etc. less income (e.g. from electricity generation)

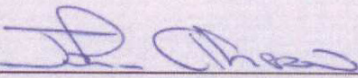
Box 6
<p>Please indicate if you wish the information supplied to be deemed confidential and state reason(s) for the information to be held in confidence.</p> <p>Information to be held in confidence Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>If yes, the reason(s) for information to be held in confidence must be stated:</p> <p>Commercially sensitive</p> <hr/> <p><i>Note: Public Bodies are subject to the provisions of FOI and AIE legislation.</i></p>

Declaration

I hereby certify that the aggregate of the amount of charges imposed by *Kerry County Council* [name of licensee] in respect of the disposal of waste at *North Kerry Landfill W001-4* [name of landfill and Waste Licence Registration Number] during **2009** [year covered by statement] were not less than the amount that would meet the total of the following costs (irrespective of whether those costs, or any of them, have been or will be met from other financial measures available to the operator), namely—

- (a) the costs incurred by the operator in the acquisition or development, or both (as the case may be), of the facility,
- (b) the costs of operating the facility during the relevant period (including the costs of making any financial provision under section 53), and
- (c) the estimated costs, during a period of not less than 30 years or such greater period as may be prescribed, of the closure, restoration, remediation or aftercare of the facility.

I further certify that the information given in this form is truthful, accurate and complete.

Signature 

Date 11/2/10

Print name John Ahern

Position Acting Senior Executive Engineer
Waste Management, Environmental Services

Appendix XIV Specified Engineering Works

Gas Utilisation Project

Rain water diversion bund – Cell 19

Leachate pipeline construction



Comhairle Contae Chiarraí

Kerry County Council

► *Specified Engineering Works Report* ◀

SEW 04 - Gas Utilisation Compound

W 0001/04 - North Kerry Landfill.

August 2010

Prepared by: Environmental Services, Kerry County Council.	Seirbhísí Comhshaoil Comhairle Contae Chiarraí.
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1.0 Contents

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9.0	Appendix 3	9

20.05.10	SEW 04	Specified Engineering Work – Gas Utilisation Compound	Revision 2
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North Kerry Landfill, Muingnaminnane, Tralee, County Kerry, W0001-04

Prepared by: Environmental Services Section, Kerry County Council.

2.0 Introduction.

This Specified Engineering Work (SEW) sets out the general detail involved in the construction of a gas utilisation compound at North Kerry Landfill.

It is prepared in accordance with Condition 3.3 of W0001-04 and Schedule B, specifically the 'Installation of Landfill Gas Management Infrastructure'.

The SEW is presented to the Agency for consideration in advance of the proposed date for the construction of the infrastructure.

3.0 Supervision and Completion of the Works

The works will be undertaken by *B9 Power* and their sub-contractors, who have experience in the electricity generation process.

Supervision will be provided by *B9 Power* during the construction works.

On completion of the works a report will be prepared for the Agency detailing the as built infrastructure as set out in Condition 3.3.3.

4.0 Description of Works

4.1 General

Currently all gas generated within the waste body is collected and flared in an enclosed flare at an average rate of 420 m³/hr.

It is proposed to construct a gas utilisation compound, including a generator set container for the production and export of electricity on/off site.

B9 Power have reviewed the current gas collection system and intend to modify it based on their gas extraction and electricity generation experience. This will allow for increased gas extraction from the waste body and the utilisation of the gas as electricity.

4.2 Description

It is proposed to locate the gas utilisation compound at the current location of the public waste acceptance skips.

The compound will consist of the following infrastructure:

- 1 Jenbacher JGC208GS Generation Set Engine and associated ancillary works (i.e. Concrete pad)
- 2 Two substation buildings for the ESB and B9 20kV equipment
- 3 Cable and trenches ducts
- 4 Installation of containerised office/welfare unit/storage unit.

The compound will be secured with 1.8m high green wire weld mesh fencing.

Appendix 1 shows a proposed layout drawing of the gas utilisation compound.

Appendix 2 shows the proposed location of the compound.

A new manifold will be installed which will be similar in size and dimension to the existing manifold but it will be fabricated using HDPE pipe and fittings and replacement isolation butterfly valves. Provision will be made to make future connection at either end of the manifold and blanketed off with stub, gaskets and blanking plates,

Appendix 3 contains an indicative design of this proposed manifold.

A control system is proposed to give gas priority to the generator set. *B9 Power* will provide a simple 2 wire voltage free signal to indicate that the engine is running or is about to start. This signal is to be used at the flare to either switch off or turndown the gas flow by an amount approximating to the gas consumed by the engine.

In the event of simultaneous failure of the Gas engine and the flare, *B9 Power* will be contacted by a telemetry system. This telemetry system will be a 24 hour/7 days a week system and *B9 Power* will respond to the call-out within a reasonable timeframe.

A connection will be made into the existing incoming line at the flare with a new 200mm pipe surface laid down the embankment to the gas compound.

A 'tee' connection will be made into the existing gas header to the flare. The new branch from the tee will be piped to a new gas booster package installed in the power generation compound to pressurise the gas supply to the engine (a nominal delivery pressure of 100 mbarg).

A gas booster skid is to be installed in the power generation compound will have an integral knock out vessel.

Gas piping from the gas booster skid into the power generation compound to the generator set container will be fabricated from stainless steel.

5.0 Nuisance Control

The works will be undertaken in an area that has not been filled with waste and thus there will be no nuisance effect.

As a matter of course all usual measures with regards to dust, mud, litter, bird and vermin control will be in place during the works

Odour patrols around the facility boundary will also be completed during the works and results logged.

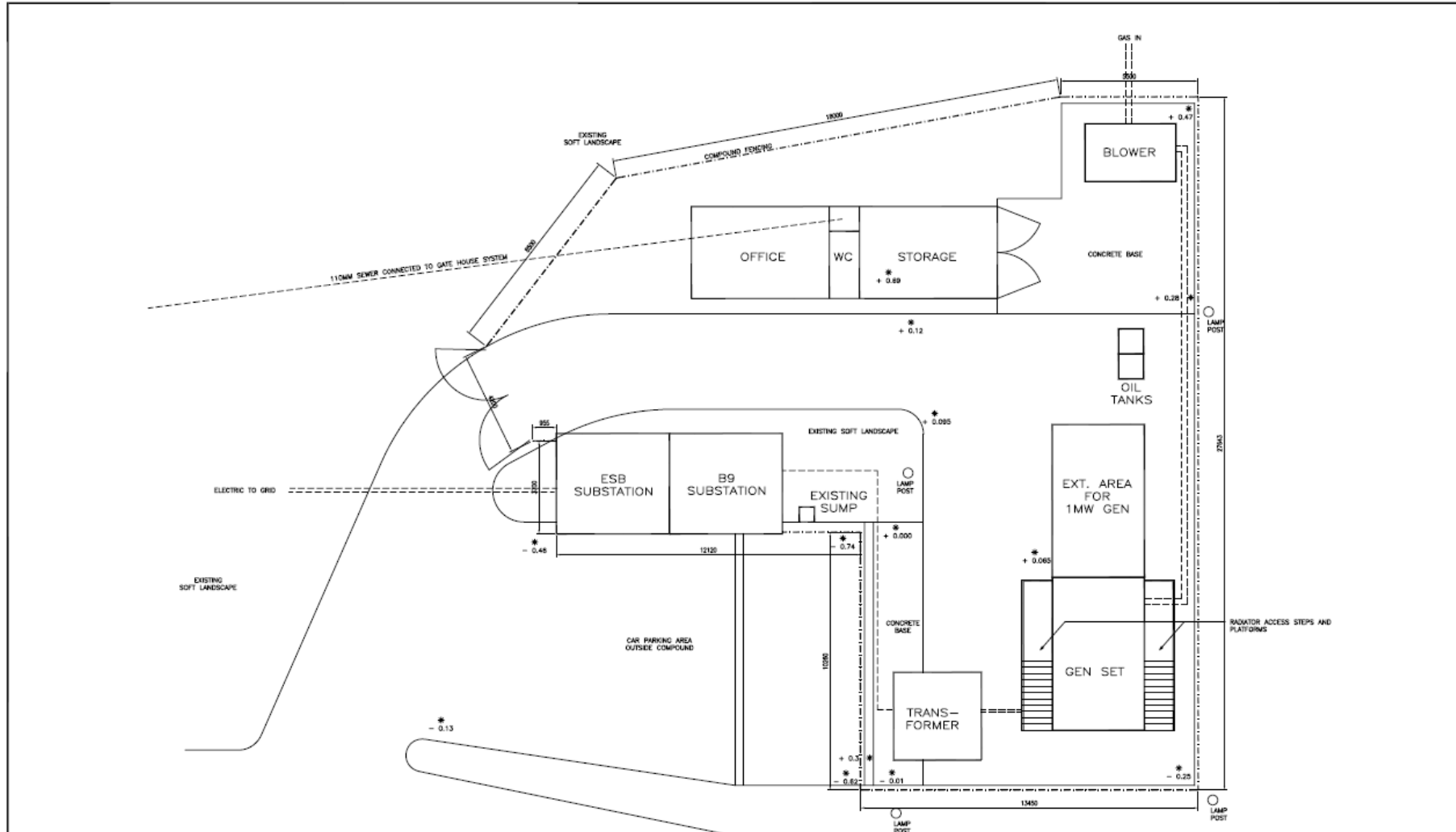
6.0 Works Schedule

The works will commence once the gas utilisation contract between Kerry County Council and *B9 Power* has been signed all plant and specialist materials are available.

It is estimated that works will commence in September 2010 and be completed within two months.

A CQAV will be completed once the works are complete.


7.0 Appendix 1 – Proposed Gas Utilisation Compound Layout



LAYOUT PLAN (Showing Equipment)

scale 1:100

ORDNANCE SURVEY IRELAND LICENCE No. AR 0105409
 CORDONAGE SURVEY IRELAND/GOVERNMENT IRELAND

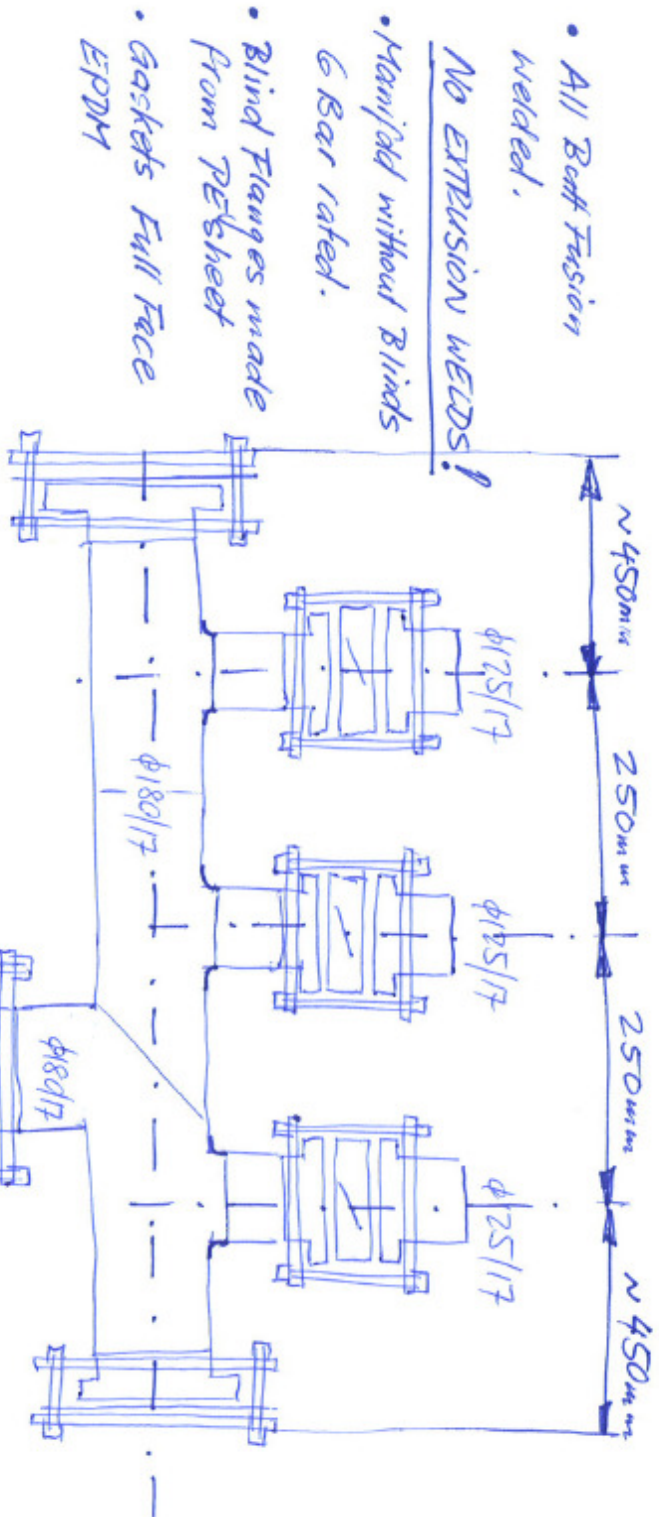
Project: ELECTRICITY GENERATION FROM LANDFILL GAS	Drawn: [Signature]	Drawg. No.: 6A		
Location: NORTH KERRY LANDFILL SITE, MUINGNAMNANE, TRALEE, CO. KERRY.	Scale: 1:100	Date: 08/07/10		
Description: PROPOSED UTILIZATION PLANT: PLAN - SHOWING EQUIPMENT				

8.0 Appendix 2 Proposed Location of Compound



9.0 Appendix 3 Propsoed Manifold Design

North Kerry Landfill B9 Manifold



- All Bolt Fusion welded.
- No EXTRUSION WELDS!
- Manifold without Blinds G Bar rated.
- Blind Flanges made from PE sheet
- Gaskets Full Face EPDM
- DN100 Butterfly Valves are lever operated. The body is made from coated cast iron with EPDM seals and 304 stainless disc. Nuts & Bolts are made from zinc plated material. We are supplying 1/2 bolt sets for gas installations; please specify if full sets are required (additional cost).
- The Manifold will arrive fully assembled

Not to scale
7/07/2010
R

egeplast

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 Airport Business Park
 Killowen, Ballygarran
 Waterford, Ireland

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 Fax + 353 51 844922
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 www.egeplast.ie



Comhairle Contae Chiarraí

Kerry County Council

► **Specified Engineering Works Report 02** ◀

Rain Diversion Bund – Cell 19

W 0001/04 - North Kerry Landfill.

May 2010

Prepared by:
Environmental Services,
Kerry County Council.

Seirbhísí Comhshaoil
Comhairle Contae Chiarraí.

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Drawing SEW 02/01	Works Location and Typical Detail	

05.05.10	SEW 02	Specified Engineering Work – Rain Diversion Bund Cell 19	Revision 1
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North Kerry Landfill, Muingnaminnane, Tralee, County Kerry, W0001-04

Prepared by: Environmental Services Section, Kerry County Council.

2.0 Introduction.

This Specified Engineering Work report (SEW) sets out the general detail involved in the construction of the a rainwater diversion bund within the footprint of Cell 19

It is prepared in accordance with Condition 3.3 of W001/04 and Schedule B, specifically the 'Installation of Surface Water Management Infrastructure' and 'Installation of Leachate Management Infrastructure'.

The SEW is presented to the Agency for consideration in advance of the of the proposed date for the construction of the infrastructure.

3.0 Supervision and Completion of the Works

The works will be undertaken by on site resources who have time won experience in working within waste cells and the precautions required when operating close to the collection blanket.

Supervision will be provided by the Facility Manager and Engineer who have experience in the installation collection infrastructure.

On completion of the works a report will be prepared for the Agency detailing the as built infrastructure as set out in Condition 3.3.3.

4.0 Description of Works

4.1 General

The location of the proposed works is indicated on Drawing No SEW 02/01.

The purpose of the works is to reduce the plan area of cell 19 that will produce leachate once waste filling commences.

4.2 Description

The line of the proposed diversion bund is indicated on Drawing Number SEW 02/01.

Initially the leachate stone drainage blanket will be carefully removed to expose the geotextile protection layer. An area in width of approximately 2 m will be exposed to allow working space.

As the stone is removed this will expose the leachate collection pipe work. The pipework will be hand cut leaving a space of approximately 1.5 m between the ends of the pipework.

The ends of the cut pipework will be marked with a marker plate above the level of the replaced leachate stone to indicate the location where the pipework will have to be reconnected once the eastern section of cell 19 is ready for filling.

Once the stone has been removed a line will be marked on the geotextile to set out the outer face of the clay diversion bund.

Site won low permeability clay will be imported into the cell and placed on top of the geotextile along the marked line. The bund will be approximately 1m in height and 0.5 m in width across its top – namely 0.75m³/m run of bund.

It is not intended that all rain water within the eastern section of the cell will be diverted as some will permeate through the geotextile – however as the elevation of the cell floor will be higher on the eastern side leachate will not be able to contaminate the rain water. A submersible pump will be placed on the lower end of the bund run as the surface water builds up and it will be pumped to the surface water holding lagoon.

All surface water is continuously monitored at the inlet and outlet from the lagoon.

Particular precautions will be taken when removing the collection blanket, all work within 150mm of the liner will be completed by hand, only a mini excavator will be used with a grading bucket and all works will be directly supervised.

All works close to the liner will be completed by hand.

When the eastern side of the cell is ready to accept waste then the clay bund will be carefully removed. The collection pipes will be reinstated with couplers and the collection blanket renewed.

As an additional precaution a buffer zone will be maintained between the clay diversion bund and placed waste.

5.0 Nuisance Control

It is not anticipated that the works will result in any increased potential nuisance.

All works will be undertaken within the footprint of an empty cell.

As a matter of course all usual measures with regards to litter, bird and vermin control will be in place during the works.

Odour patrols around the facility boundary will also be completed during the works and results logged.

6.0 Works Schedule

The works will commence in advance of the opening of cell 19.

It is estimated that works will commence in June 2010 and be completed within two weeks.

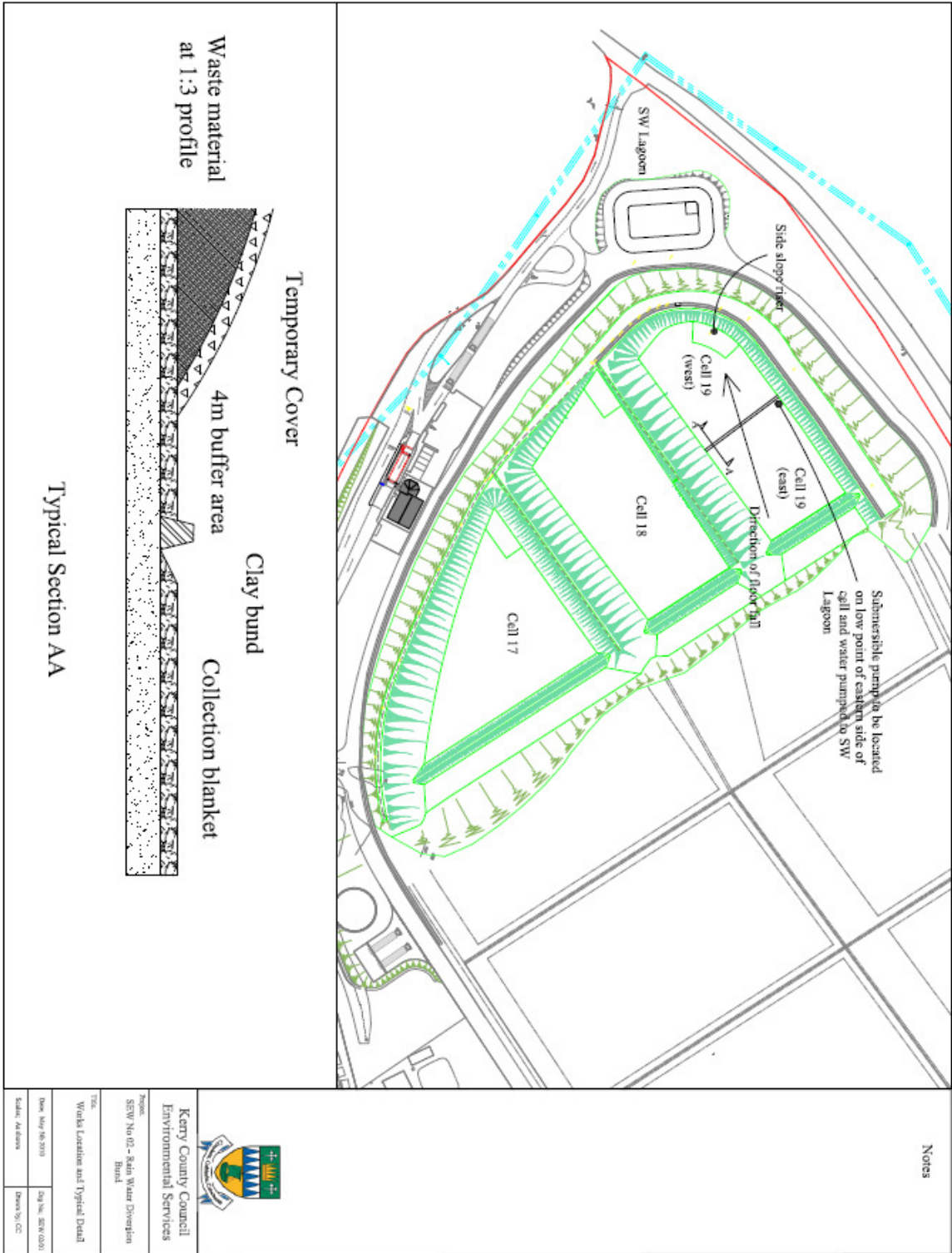
A CQAV will be completed once the works are complete.

7.0 Appendix 1

- Drawing SEW 02/01 – Works Location and Typical Detail

Appendix No 1

Drawing No SEW 02/01 – Works Location and Typical Detail



Kerry County Council
Environmental Services

Project:
SEW No.02 - Rain Water Diversion
Bund

Title:
Works Location and Typical Detail

Date: May 26, 2011	Doc No: SEW (02)
Scale: As above	Drawn by: CC



Comhairle Contae Chiarraí

Kerry County Council

► **Specified Engineering Works Report 04** ◄

Leachate Pipeline from North Kerry Landfill to Castleisland Wastewater Treatment Plant

W0001/04 - North Kerry Landfill.

November 2010

Prepared by:

*Environmental Services,
Kerry County Council.*

*Seirbhíse Comhshaoil
Comhairle Contae Chiarraí.*

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No 1 No 2	Standard Operating Procedures (draft) Drawings; 10-01 Cover Sheet 10-02 Proposed pipeline Route 10-03 Pipeline Route, Map 1 of 7 10-04 Pipeline Route, Map 2 of 7 10-05 Pipeline Route, Map 3 of 7 10-06 Pipeline Route, Map 4 of 7 10-07 Pipeline Route, Map 5 of 7 10-08 Pipeline Route, Map 6 of 7 10-09 Pipeline Route, Map 7 of 7 10-10 Pumping Station - Details 10-11 Longitudinal Sections 10-12 Break Pressure Tank - Details 10-13 North Kerry Landfill - Works 10-14 Cleaning Chamber, DAV and Trench Details	

03.11.10	SEW 04	Specified Engineering Work – Leachate Pipeline	Revision 1
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North Kerry Landfill, Muingnaminnane, Tralee, County Kerry, W0001-04
Prepared by: Environmental Services Section, Kerry County Council.

2.0 Introduction.

This Specified Engineering Work report (SEW) sets out the general detail involved in the construction of a leachate pipeline and associated infrastructure from North Kerry Landfill (NKL) to Castleisland wastewater treatment plant (WWTP).

It is prepared in accordance with Condition 3.3 and Schedule B of waste licence W0001-04, specifically the requirement to prepare a SEW for the 'Installation of Leachate Management Infrastructure'.

The SEW is presented to the Agency for consideration in advance of the of the proposed date for the construction of the infrastructure.

3.0 Supervision and Completion of the Works

The works will be undertaken by a number of parties with overall supervision and responsibility resting with Kerry County Council. The various parties include;

- KCC personnel – HDPE pipeline construction
- M&E Contractor – installation of pumps, flow meters and SCADA
- Civil Contractor – reinforced concrete works
- Supervision – KCC personnel.

Supervision will be provided by the Engineering Staff of KCC who have adequate experience in the following areas;

- installation, testing and commissioning of leachate pipeline infrastructure (both HDPE and DI)
- installation, testing and commissioning of mechanical and electrical infrastructure
- supervision of civil works including testing of retaining structures
- preparation of construction quality assurance documentation.

Confirmation of the name and contact details and relevant experience of the supervisory personnel will be forwarded to the agency for approval in advance of undertaking the works.

Supervision will be provided on a full time basis during the construction phase of the project.

On completion of the works a Construction Quality Assurance Validation Report will be prepared for the Agency.

The report will detail the as built infrastructure and the suite of testing (including results, retests if required and conformance certificates) that has been completed on the installed infrastructure as set out in Condition 3.3.3 – full details are included in Section 7.

4.0 Description of Works

4.1 General

The location of the proposed works is indicated on Drawing No 10-02 – Proposed Pipeline Route.

The purpose of the works is to provide a pipeline transfer system instead of the current tankering by road arrangement for leachate that is generated at NKL.

The pipeline will convey the leachate to Castleisland WWTP where it will be adequately treated.

4.2 Project Description

The pipeline will commence at the existing reinforced concrete holding tank at NKL and terminate at Castleisland WWTP. The total distance is 10.8km. The pipeline will be HDPE, a pump sump will be constructed along the route to convey the leachate to the WWTP.

The detail of the proposal is set out in the following sections.

4.2.1 Route Selection

The proposed route from NKL to Castelisland WWTP is highlighted on Drawings No 10-02 to 10-09. The route has been selected in order to follow the line of public roadways as far as practical.

4.2.2 Pipeline Design

The pipeline system has been designed taking the following criteria into consideration;

- sealed system
- maximum use of existing infrastructure
- achievement of self cleansing velocities
- carrying capacity of gravity sections of pipeline
- maximum pressures that can be developed in the pipeline sections
- break pressure tank location
- location of installations relative to receptors
- mitigation and potential nuisance
- ease of cleaning and maintenance
- leak detection
- integrity testing during construction and in service
- material compatibility
- ease of construction and avoiding unnecessary hazards
- operational control and interface with the WWTP

The scheme layout consists of;

- interconnecting the existing lagoons with the recently constructed reinforced concrete holding tank at NKL
- pumping from the holding tank to a break point in the pipeline
- gravity flow from break point to pump sump
- pumping leachate from pump sump to WWTP for treatment
- flow meters at various locations to confirm integrity of pipeline during service
- continuous monitoring to ensure compliance with operational procedures

The layout of the pipeline is shown in Drawings No 10-02 to 10-09.

The pressure rating of pipeline exceeds any potential pressures that can be developed in the line allowing for an adequate factor of safety. The diameter of the main will also be designed taking account of the flow regime (pumped/gravity).

Fusion welded HDPE (PE 100) has been chosen as the material type and jointing method due to its pressure rating, resistance to chemical attack and aggressive soil conditions, robustness and ease of fabricating the welds. Fusion welding facilitates visual check on weld success.

HDPE is compatible with DI fittings both in sizes and material (air valves, hydrants, valves etc.)

The pump at the holding tank, which will be a variable speed pump will have a pressure limit switch. Thus, if the pressure at the pump exceeds the set limit then the pump will automatically shut down.

The pipeline will discharge into a pump sump from where it will be pumped to the WWTP. The rising main will have adequate capacity to convey the leachate from the pump sump. The pump sump will have a low and high level cut in/out probes and a high level alarm which will notify an emergency number in case of emergency and a duty and stand by pump arrangement.

In the event of blockage the high level alarm will trigger before the flow is diverted through the bypass pipework. Any such bypass flow will be fully retained within the pipeline as it is a sealed system. A duty/stand by pump arrangement in an adjacent dry well is proposed for this location.

The rising main will have flow meters at the NKL discharge point, pump sump and inlet to the WWTP. These will confirm the continuous integrity of the line with regard to bulk flows.

4.2.3 Excavation details

The pipeline will be placed in a 600mm trench, pipe bedding 150mm of Type A material with 300mm above the crown, backfill with type B material to road formation, minimum cover 750mm. Where cover is less than 750mm concrete surround will be used.

Stream crossings will be completed by strapping to the structure and lagging the pipe against frost action.

All trenches on roads will be cut in advance by a road saw and temporary reinstatement will follow pipe testing. Permanent reinstatement will be completed as per the construction works programme.

4.2.4 Break Pressure Tanks

Break Pressure Tanks (BPT) are proposed in order to dissipate potential hydraulic pressures – the details of the tanks are outlined in Drawing No 10-12.

Each BPT has both a flow limiting valve and emergency shut off valve layout on entry to the tank. The flow limiting valve ensures that the entry flow cannot exceed the outlet flow from the tank and the shut off is a fail safe device that will shut down the flow if a pre-determined height of liquid is reached in the tank.

The tanks will be constructed from HDPE material on the inner face and reinforced concrete on the outer side. The HDPE is resistant to attack from leachate. Entry and exit pipework will be welded to the HDPE walls with puddle collars ready for concrete surround. Access to the tank would be via a pressure rated access hatch (one to each chamber).

They will be located to break the potential pressure head into equal values and avoid any receptors.

The flow limit valve and fail safe valves shall be the Cla Val series or similar namely;

- Cla-val series 40-01 flow limiting valve
- Cla-val on/off float level control 100-CF9.

The valves and materials are compatible with flanged HDPE pipework.

The pipeline has been designed to withstand the maximum hydrostatic pressures that could develop in each discrete section of the pipeline in an emergency situation.

The pipeline has been designed to ensure that self cleansing velocities are achieved along the length of the pipeline.

4.2.5 Pipeline Cleaning (in-service).

Air scouring is the intended method of cleaning the pipeline.

Cleaning chambers will be constructed approximately every 500–700m along the line. Each will be as per the general detail shown in Drawing No 10-14.

These locations will also be used for pressure testing the pipeline during construction and also post construction (every 5 years coinciding with three cleaning cycles).

Precautions in the design have been taken to limit the potential for calcification and sedimentation within the system.

The main constraint on the cleaning process is to capture all discharge from the line during the cleaning – this will be done by connecting the scour outlet to a tanker with a suitable rated flexible pipe and fitting.

The layout of each station will have a sluice valve at either end of the station with scour, hydrant and air valve in between. It is intended to construct the station within a RC chamber with lockable covers to ensure water tightness, security (avoid possible tampering with valve settings) and facilitate ease of cleaning.

All the fittings and interconnecting pipework will be DI.

4.2.6 Calcification

The factors contributing to calcification are reduced in the proposed pipeline, namely smooth internal bore, constant temperature and a non-reactive pipe material.

The open holding lagoons connected in series and with stilling infrastructure affords an opportunity for the calcification to occur in areas where the solid material can settle and be removed during lagoon/tank cleaning.

Precautions have been taken in the holding tank design. The outlet pipework within the tank will be set higher than the floor level thus settled material is not drawn into the pipeline at this point. Similar arrangements are to be installed in the upstream holding lagoons.

These factors coupled with a dedicated cleaning system and achievement of self cleansing velocities eliminate the requirement for a calcification plant before discharge.

4.2.7 Material Compatibility

Construction materials to be used will include;

- HDPE
- ductile iron fittings
- concrete

HDPE is resistant to attack from leachate and has a time established record for effective operation within landfills. It is susceptible to degradation by exposure to sunlight over an extended period. All pipelines will be buried as per the detail above.

All fittings such as air valves, scour, gate and those around the BPT are of similar construction. The body is ductile iron with epoxy coating, the internal mechanisms combine stainless steel, zinc coating and EPDM rings.

All the fittings have been used in similar applications and in landfill pipelines in general and have a time established record for successful operation.

The materials are compatible with each other in both size and reactivity.

5.0 Methane Evolution

The outline design was assessed using a Operational Hazard Analysis Procedure to consider process hazards.

This analysis particularly concentrated on the potential for methane evolution.

The report made a number of recommendations which will be followed to address the issues identified.

The bulk of the recommendations referred to the elimination of unventilated headspaces within the system. This has been adhered to in the design.

The exercise was completed based upon an outline design. Since its completion a fundamental design change has been included, namely, that the leachate main will discharge directly to the WWTP and will not connect to the municipal foul collection network.

This has eliminated the potential hazard of gas migration within the collection network.

Venting the system allows the potential for emissions that may give rise to nuisance (see Section 6).

The pipeline will have double air valves at high points, significant changes in grade and break pressure tanks. Each DAV will be connected within its chamber to a 4m vent column. Columns in areas which could be sensitive will have activated carbon inserts to counter any odourous compounds in the release.

The on-site process of collection and storage of the leachate and its residence time in the lagoons will ensure that passive emissions will occur at the open lagoons at NKL rather than within the pipeline system.

Measurements of the level of methane in solution in the leachate has been completed to get a representative time bound data set.

As an initial data search samples were retrieved on May 25th 2010 directly from three cells which contain leachate of varying ages from fresh, medium to old. The results of this assessment is presented in Table 5.3.1

Table 5.3.1: Assessment of leachate directly from cells 16, 11 and 5

	<i>Ammonium</i>	<i>pH</i>	<i>Conductivity</i>	<i>COD</i>	<i>Total Organic Carbon</i>	<i>Methane</i>
	mg/l	pH units	µS/cm	mg/l	mg/l	mg/l
<i>Cell 16 (fresh)</i>	1,804	7.7	14,920	1,770	519	0.08
<i>Cell 11 (medium)</i>	185	7.3	2,340	196	53.7	2.12
<i>Cell 5 (old)</i>	783	7.3	7,490	850	224.9	1.27

On foot of the initial assessment a more extended monitoring set was required for the leachate held within the holding lagoons.

Leachate held in the lagoons 1 and 2 has been assessed for methane in solution, the following table details the results of this analysis. The samples have been retrieved over an extended period in order to gain a representative data set which would take account of variable factors such as weather changes etc.

Table 5.3.2: Leachte Assessment – Holding Lagoons 1 and 2.

<i>Date</i>	<i>Lagoon 1 (40% site flow)</i>			<i>Lagoon 2 (52% site flow)</i>		
	<i>Methane, mg/l</i>	<i>pH</i>	<i>Ammonia as NH₃-N</i>	<i>Methane, mg/l</i>	<i>pH</i>	<i>Ammonia as NH₃-N</i>
27.07.10	0.88	7.36	388.6	1.21	7.62	888.8
03.08.10	0.75	7.16	194.3	0.88	7.34	217.3
17.08.10	1.54	8.12	196.7	3.11	7.96	909.5
24.08.10	0.94	7.81	112.5	2.51	7.90	713.0
31.08.10	0.78	7.59	89.4	1.55	7.65	425.0
07.09.10	0.47	8.23	33.4	1.01	8.47	238.0
Average	0.89	7.71	169.2	1.72	7.82	565.3

Lagoon 3 receives run off from the composting slab – this contributes 8% of site flow and does not have methane in solution.

As can be seen from the above data the concentration of methane in solution is low – as the holding tank will have leachate from three lagoons a weighted average figure for the concentration is 1.32mg/l.

Notwithstanding the low concentrations the primary safeguards upon which the system relies are;

- the elimination of unventilated headspaces in the system
- headspace methane monitor in holding tank – no discharge if above a reference limit
- use of ATEX rated devices in areas zoned pending the area assessments
- direct connection between NKL and the WWTP - passive receptor

6.1 General

Potential nuisance from the system could include, odour, noise and vectors.

These will be addressed on site at NKL prior to any discharge. This will be done by a combination of aeration, residence time, balancing and passive venting.

Precautions are taken along the pipeline route such that in the event of any nuisance it will be abated satisfactorily and not cause a nuisance.

The pipeline system is vented to the atmosphere at various locations along its length. Each vent point will terminate at a height of 4m above ground level.

The air valves will be located in locations removed from any receptors. The columns in the vicinity of any receptors will be fitted with insert activated carbon filters (which will be changed once exhausted).

Noise from the pipeline filling/emptying will only occur in full bore locations (when the system acts in rising main conditions). The air valves in these sections are not in the vicinity of any receptors however they will have an acoustic insert to satisfactorily abate any potential noise.

Flow into the break pressure tanks takes place under the top level of liquid and thus eliminates this potential source of noise. The tank will be covered and the vent will have an acoustic insert as an additional measure.

There is no identified potential for any nuisance due to vectors.

A complaints register exists as part of the Environmental Management System for the Facility. It records all complaints due to the operation of the facility.

A particular register is included for the system as part of the EMS to ensure its satisfactory operation and maintenance.

This particular register will capture all comments on the pipeline system and form a review structure – it will include information on the nature of the complaint/observation, immediate action taken, follow up action, detail on feed back to complainant and any consequent review of procedures (see SOP's).

6.2 During Construction

It is not anticipated that the works will result in any increased potential nuisance during construction.

The works area will be mobile and operate within a small defined area. Traffic control will be required during construction.

A Health and Safety Plan will be developed for the project by the PSCS and it will detail all measures to be taken for the safe completion of the works.

6.3 System in Operation

The pipeline is intended to convey leachate from NKL to Castelisland WWTP.

As the pumping of the leachate from site will be sequenced to coincide with troughs in the flow load at the WWTP then some section of the pipeline will regularly fill/empty – refer to Drawing No 10-11 for details.

As a result air within the system will be discharged during filling.

This discharge will be controlled through double air valves (DAV) at predetermined locations – they have been located in areas removed from receptors.

As a precaution the DAV will be connected to a vent column with a minimum 4m height above ground level. Further any columns within 150m of any receptors will have activated carbon inserts in the column which will be replenished as required.

A specific set of Standard Operating Procedures have been developed for the transfer system – these have been developed to ensure that the system is operated without nuisance.

7.0 Construction Quality Assurance Validation (CQAV)

7.1 Construction Testing and Record Keeping

Detailed records will be taken of all testing of the system as it is constructed.

These original records will be included in the CQAV report. Each test will be witnessed and signed off by the supervisory personnel.

Fusion welding of the pipes will be undertaken by experienced and trained personnel.

Each weld will be completed following the manufacturers recommendations. As an additional precaution all welds will be completed within a weather proof enclosure.

Manufacturers' Declaration of Conformity certificates – codes to which they have been manufactured, quality of the raw material used and batch material testing - will be collated for inclusion in the CQAV for the HDPE pipes and fittings. All HDPE pipes and fittings will be to PE 100 specification.

Similarly certificates of conformance and warranty for all fittings (valves etc.) will be included in the report. These will also form part of the Safety File for the project.

Pipeline testing will be completed in sections up to 500m in length – it is intended to test lengths between cleaning stations where stub ends will be available for test fittings. The pipeline lengths will be tested to 1.5 times its working pressure.

The hydrostatic test will confirm the integrity of the pipeline as constructed.

Break pressure tanks, chambers and manholes will have infiltration tests and water tightness tests completed to ensure integrity.

7.2 In-Service Testing

Continuous integrity testing will be confirmed by the installation of three Mag Flow meters at the holding tank, pump sump and close to the discharge chamber at the WWTP.

The totalised flows should be equal allowing for the amount within the pipe – the pipeline will never be fully empty given its profile but the difference should remain constant.

Future hydrostatic pressures testing of the pipeline will also be conducted every 5 years (coincide with three cleaning cycles).

In service wear rate assessment can be completed at locations subjected to higher velocities – a sacrificial segment will be retrieved and measured. This is a practical option in this instance.

A full CQAV will be completed on completion of the project and submitted to the EPA as per the waste licence condition.

8.0 Waste Water Treatment Plant

8.1 General

As per condition 6.7.2 of W0001-04 the Water Services Authority responsible for Castleisland WWTP have been consulted in the preparation of this proposal.

The condition states;

All leachate tankered from the facility shall be transported via tanker to Castleisland or Tralee wastewater treatment plants and disposed of there unless otherwise agreed in advance by the Agency. Permission for the disposal of leachate at the above mentioned wastewater treatment plants shall be obtained from the relevant Sanitary Authority on an annual basis. The quantity of leachate disposed of shall be subject to the prior agreement of the Sanitary Authority. Disposal procedures for the leachate at the treatment plant shall be in accordance with any written requirements of the Sanitary Authority.

In compliance with this condition it is intended to divert leachate for disposal from Tralee to Castleisland WWTP once the pipeline has been constructed.

A formal confirmation of Water Services consent will be forwarded as per the condition.

The proposed change in the terms of the condition refers to the use of a dedicated pipeline as described in this SEW from the current method of tankering the leachate by road.

Disposal procedures (SOP) has been developed in draft form for the project – these will be formalised with the Water Services Authority in advance of the project being completed. A draft copy of the SOP's have been included for information in Appendix No 1.

8.2 Intended Operation.

The intended operational procedure is that discharge from NKL will only occur during low flow conditions at the plant. In normal operational conditions this would refer to discharges from mid-night to 8am.

However storm events will put the WWTP off line for periods and consequently a Standard Operating Procedure has been developed which sets out contingency arrangements. A copy of the SOP's as developed in draft form are included in Appendix 1 for information.

There is approximately 2,000m³ of available site storage in the lagoons and holding tank.

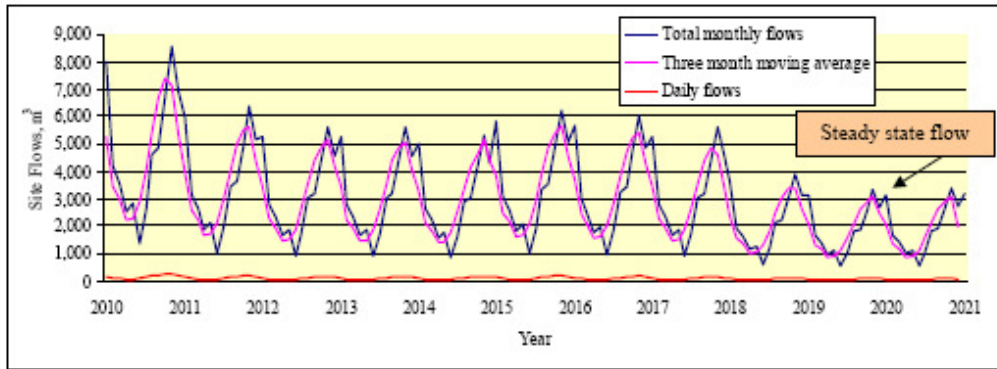
In steady state conditions there will be a maximum hydraulic flow of 98m³d⁻¹ and within the operational phase it will be 188m³d⁻¹. This equates to 20 to 10 days available site storage. Reference to Table 8.2 outlines the hydraulic flow profile.

The estimated Biological and Hydraulic Loading are set out in the following tables and graphs.

Table 8.1: Estimated PE loading

Location	Description	% Site Flow	Volume, m ³	BOD, mg/l	PE eq at 60g/p/d
Lagoon 1	Receives 12 capped cells	40	29,490	21.8	29
Lagoon 2	Receives 2 capped and 2 active	52	38,338	254	444
Lagoon 3	Composting slab	8	5,898	19.8	5
In 2009			73,726		479
In 2016			39,997		212

Graph 8.1: Site flows until aftercare



The red line in Graph 8.1 represents the averaged daily flows that will be expected until steady state is achieved. These figures are reproduced in the Table 8.2.

Table 8.2 – Average daily site flows, $m^3 d^{-1}$ and flow rate from site over 8 hours ls^{-1}

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Max
2010									179	223	246	238	246
2011	178	131	85	74	56	57	71	100	134	167	184	187	187
2012	147	115	75	65	49	50	63	88	118	147	162	171	171
2013	140	115	75	65	49	50	63	88	118	146	161	168	168
2014	135	109	71	61	46	47	60	84	111	139	153	172	172
2015	147	128	83	72	54	55	70	98	130	162	179	188	188
2016	152	124	81	70	53	53	67	95	126	157	174	180	180
2017	143	115	75	65	49	50	63	88	118	147	162	154	162
2018	112	80	52	45	34	35	44	61	82	102	112	113	113
2019	88	68	45	38	29	30	37	52	70	87	96	102	102
2020	83	69	45	39	29	30	38	53	70	88	97	103	103
2021	84	69	45	39	30	30	38	53	71	88	98	68	98

Site flow over 8 hours, ls^{-1}

2010									6.22	7.75	8.55	8.28	8.55
2011	6.19	4.54	2.96	2.56	1.93	1.96	2.48	3.48	4.65	5.78	6.38	6.49	6.49
2012	5.09	4.00	2.61	2.25	1.70	1.73	2.19	3.07	4.09	5.10	5.62	5.95	5.95
2013	4.85	3.99	2.60	2.25	1.70	1.73	2.18	3.06	4.08	5.08	5.60	5.84	5.84
2014	4.68	3.79	2.47	2.13	1.61	1.64	2.07	2.90	3.87	4.82	5.32	5.96	5.96
2015	5.09	4.43	2.89	2.49	1.88	1.92	2.42	3.40	4.53	5.64	6.22	6.53	6.53
2016	5.27	4.29	2.80	2.42	1.83	1.86	2.34	3.29	4.39	5.46	6.03	6.24	6.24
2017	4.98	4.00	2.61	2.25	1.70	1.73	2.18	3.06	4.09	5.09	5.61	5.33	5.61
2018	3.91	2.78	1.81	1.56	1.18	1.20	1.52	2.13	2.84	3.54	3.90	3.93	3.93
2019	3.06	2.37	1.55	1.33	1.01	1.03	1.29	1.82	2.42	3.02	3.33	3.54	3.54
2020	2.89	2.39	1.56	1.35	1.02	1.03	1.31	1.83	2.45	3.05	3.36	3.57	3.57
2021	2.92	2.41	1.57	1.36	1.03	1.04	1.32	1.85	2.47	3.07	3.39	2.37	3.39

The flows of relevance are those from 2012 onwards, assuming 40 week construction commencing 2011.

Blending and balancing at NKL will eliminate the possibility of shock loading and the site flows can be coincided with the low flow pattern at the WWTP.

Leachate has previously been disposed of at Castleisland WWTP – some initial operational difficulties arose at the time.

These were as a result of the method of transportation resulting in shock loading. The shock loading of fresh leachate presented some operational difficulties however these were resolved and the plant then operated satisfactorily

Currently all leachate is tankered to Tralee WWTP where it is adequately treated.

9.0 Comparable Infrastructure

Contact has been made with other landfills where similar systems are in operation and cognisance has been taken of the time won experience at these facilities.

The facilities are;

- Kinsale Road, W0012-02 (latest) – leachate is collected and discharged to public sewer.
- Corramure Landfill, W0077-03 - leachate is collected and is discharged directly to WWTP.

10.0 Works Schedule

The works will commence in 2011 once the project has received the necessary Planning Permission and Agency approval.

It is estimated that works will be completed within forty weeks.

A CQAV will be completed and forwarded to the agency once the works are complete.

11.0 Appendices

Appendix No 1 – Standard Operating Procedures (draft)

Appendix No 2 - Drawings

Drawing Schedule:

10-01	Cover Sheet
10-02	Proposed pipeline Route
10-03	Pipeline Route, Map 1 of 7
10-04	Pipeline Route, Map 2 of 7
10-05	Pipeline Route, Map 3 of 7
10-06	Pipeline Route, Map 4 of 7
10-07	Pipeline Route, Map 5 of 7
10-08	Pipeline Route, Map 6 of 7
10-09	Pipeline Route, Map 7 of 7
10-10	Pumping Station – Details
10-11	Longitudinal Sections
10-12	Break Pressure Tank - Details
10-13	North Kerry Landfill - Works
10-14	Cleaning Chamber, DAV and Trench Details

