

BORD NA MÓNA 

BORD NA MÓNA ENERGY LIMITED

Derrygreenagh, Rochfortbridge, Mullingar, Co-Westmeath.

**Annual Environmental Report 2010
Clonbullogue Ash Repository
Waste Licence W0049-02**

March 2011

Bord na Móna today operates 5 main subsidiary companies in more than 20 locations throughout Ireland, the UK and USA. The principal businesses are in the Energy, Resource Recovery, Horticulture, Home Heating and Wastewater Treatment and Air Pollution Abatement markets. The company also engages in an extensive rehabilitation program to develop its peat lands in an environmentally sustainable manner.

A NEW CONTRACT WITH NATURE

Bord na Móna has long recognised the need to diversify its activities in order to secure a sustainable future. In this context we identified the energy and resource recovery sectors as appropriate areas of growth and development, given our assets, strengths and skills. Significant challenges face Ireland in meeting the country's needs to provide secure sustainable energy and manage waste while minimising the impact on the environment.

Bord na Móna is in a strong position to contribute to dealing with these challenges. We have a unique mixture of assets, experience and innovation which will enable us to cross-link our activities in energy, water and resource recovery to provide products and services which will meet Ireland's needs. We also have the capacity to become an exemplar for others to follow in these fields. With this background we have scoped out a new vision for the future sustainable development of Bord na Móna.

Following on from our vision, we have developed a new mission for Bord na Móna which the Company is committed to achieving.

In 1934 the Turf Development Board was formed to 'develop and improve the turf industry.' The experience of fuel shortages during the war re-enforced the Irish State's commitment to developing the country's bogs. In 1944 the TDB was asked to devise and submit a comprehensive programme, the outcome was the transformation in 1946 of the TDB into Bord na Móna. The Board was given a mandate to increase the use of peat as a fuel and in energy production. Markets for the use of moss peat in horticulture were also developed.

In 1990 Bord na Móna implemented a divisionalised and decentralised structure, designed to delegate responsibility downwards ensuring a sharper focus on each profit centre and a greater spirit of enterprise.

Group Vision

We conduct our affairs with openness, honesty and integrity.

We are Ireland's leading environmentally responsible integrated utility service provider encompassing electricity, heating solutions, resource recovery, water, horticulture and related services.

We capitalise on international opportunities where we have a competitive advantage.

We achieve continuing growth through superior customer service, outstanding quality and innovation delivered through the excellence and commitment of our people.

We engage in sustainable profitable business in the communities we serve, which is rewarding and challenging for employees and other stakeholders.

Group Mission



The vision statement defines the Company's purpose, in terms of its values.

Values are guiding beliefs about how things should be done.

The vision statement communicates both the purpose and values of Bord na Móna.

For employees, it gives direction about how they are expected to behave and inspires them to give their best. Shared with customers, it shapes the customers' understanding of why they should work with Bord na Móna.

Bord na Móna will seek solutions that optimise the creative energy and potential of the organisation, driven by long term goals and the organisation's vision and mission.

In this context our devolved business units will align their vision and strategic planning with the global direction provided.

Consistent with our vision, innovation will once again return to the core of everything we do. We will capitalise on opportunities to cross fertilise our unique range of skills and technologies that add value and are socially and environmentally sustainable.

Greater focus will be placed on managing and developing our land assets in a responsible and sustainable manner. Our award winning initiatives at Lough Boora (Co. Offaly) and Oweninny (Co Mayo), provide shining examples of what can be achieved

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Ground Water,
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Section 1.

1.1 Introduction

The following is the Annual Environmental Report for the Clonbullogue Ash Repository, located at Cloncreen, Clonbullogue, Co Offaly. It covers the period from 1st Jan 2010 to 31st December 2010.

1.1.1. Environmental Policy



Environmental Policy Statement

Bord Na Mona Energy Limited is a commercial semi-state body with responsibility to develop Ireland's peat resources in the national interest.

Bord Na Mona Energy Limited is committed to gather and make available information on all aspects of its environmental impact and to help improve understanding among the public generally of its role and of the importance of Irish peatlands.

Bord Na Mona Energy Limited recognises the importance of peatland conservation.

Bord Na Mona Energy Limited will leave behind all areas it owns as either an economically or socially integrated resource of high environmental value.

Bord Na Mona Energy Limited seeks to conduct all aspects of its business in an environmentally sensitive manner.

Bord Na Mona Energy Limited operates an environmental management system specifically addressing the following impacts:

- Discharges to water
- Emissions to atmosphere
- Waste disposal
- Use of natural resources
- Noise, vibration, odour, dust and visual effects
- Natural environmental and eco-system

The environmental management system will be monitored, maintained and continually improved. A system of regular environmental audits will be put in place.

Bord Na Mona Energy Limited will continue research and development (R&D) into all aspects of its environmental impact.

This statement is published and is available at all locations within the section and its contents are brought to the attention of all employees.

1.2 Site Description

The Clonbullogue Ash Repository is located approximately 8 km South West of the Town of Edenderry and 2 km North West of Clonbullogue village. The facility is located approximately 0.75 km from the Clonbullogue to Daingean road (third class road which links the Edenderry to Tullamore Regional Road – R402). It is located on Cloncreen bog, a cut-away peatland area within the Allen Group of Bogs. The Northern, Western and Eastern sides of the landfill are bounded by raised and/or cut-away peatlands, while the Southern side is bounded by a tree line, which is subsequently bound by pastoral land.

Topographically, the Allen Group of Bogs consists of raised bogs of the Central Lowlands which have been extensively harvested by mechanised cutting. Drainage ditches evacuated in the surrounding peatlands by Bord na Mona are orientated in an East – West axis and essentially divert any seepage or drainage water from the peatlands. Drainage from the site is along a West – East drainage ditch which discharges ultimately to the Figile River. The geology of the Cloncreen site is dominated by the Upper Palaeozoic Lower Carboniferous Allenwood formation (Edenderry Limestone).

1.3 Waste Activities carried out at the Clonbullogue Ash Facility.

The functional element of the Bord na Mona Energy Ltd, Clonbullogue Ash Repository is to dispose of inert waste products (fly ash and bottom ash), arising from peat combustion within the boiler of the Edenderry Power Ltd., Peat Fired Power Station.

Further to this, Bord na Mona was successful in 2006, in a review process of the facility licence. This review was carried out as a result of Edenderry Power Ltd gaining permission to co-fuel peat with biomass and or meat and bonemeal.

The main aspect of the review was to allow a change in the type of ash that could be accepted because the previous licence only allowed for the acceptance of peat ash.

During 2010 there was 99,175 tonnes of biomass co fuelled in the station. This produced approximately 495.87 tonnes of biomass ash, which was transported to the repository and deposited in cell 3 B.

The relevant waste disposal and waste recovery activities, as per the Third and Fourth Schedules of the Waste Management Act 1996 to which this activity applies are:

Third Schedule – Waste Disposal Activities:

Activities on the site can be categorised as “deposit on, in or under land”

Fourth Schedule – waste Recovery Activities:

No activities as defined by the Fourth Schedule of the Waste Management Act 1996 will take place on-site.

Section 2: Environmental Data

2.1 Waste Quantity & Composition

Quantity

During the reporting period (1st Jan 2010 to 31st December 2010) a total of 5,475 tonnes of Bottom Ash and 26,684 tonnes of Fly Ash were disposed of in the Ash Repository.

This gives a total of 32,159 tonnes for the period.

In addition one waste skip, weighing 3.5 tonnes was removed off site as part of a general clean up conducted during the year.

Composition

Bottom Ash & Fly Ash Composition – Mineralogy: Furnace bottom ash is a solid, coarse grained, granular ash. White fly ash is lighter and fine grained and accounts for – 80% of the ash produced from peat combustion. Compositional analysis of the fly ash indicates the presence of a large quantity of inerts which are calcium, magnesium, iron, silica and sulphur based (Calcite – CaCO_3 , Hydrated Lime – $\text{Ca}(\text{OH})_2$, Quartz – SiO_2 Brucite – $\text{Mg}(\text{OH})_2$ and Magnesium Carbonate MgCO_3 , are typically the main phases present) and trace amounts of heavy metals (Zn, Cu, Pb, B Ni, V Mo, Cr, As, Sr).

Bottom Ash & Fly Ash Leachate Composition: In general, the chemical quality (BOD, COD, Phosphorous – P, NH_3 – N, NO_3 – N) of the leachate associated with the fly and bottom ash samples are good. The leachate generated from peat fly ash, dominated by admixed and surface adsorbed alkali and alkaline salts, is slightly acidic due to the dissolution of the absorbed SO_2 onto the surface of dissolved organic salts. However, thereafter, the solution becomes quickly alkaline due to the hydrolysis of CaO flecks and the dissolution of $\text{Ca}(\text{OH})_2$. A significantly elevated pH is, therefore noted for both leachate samples. Only trace amounts of heavy metals (As, Sn, Hg, Cr, Zn, Cd, Pb, Co, Ni, Fe, B, Cu, Al, Ba) were detected in both leachate samples.

2.2 Remaining Capacity at Ash Site

At present the facility has just completed its tenth year of operation. At current ash volumes being accepted at the facility and experiences to date in cells 1, 2 and 3, it is estimated that the remaining capacity for peat ash is approximately 811,866 tonnes, to be deposited in five future cells.

Under current conditions cell 3 B is expected to receive approximately two more years of ash, although this may reduce depending on whether meat and bonemeal is co-fuelled with peat in the future.

2.3 Emission Data

2.3.1 Pollution Emission Register Report

There are no materials used in the operation of this facility which come within the remit of the pollution emission register.

2.3.2 Pollution Emission Register Proposal

Should operations at the facility require the use of materials on the pollution emission register, a report on such materials will be included in future AER's.

2.3.3 Dust

Dust monitoring was carried out between April and September 2010. Monitoring took place at four locations: DM01, DM02, DM03 and DM04. The Bergerhoff method of collection was used. During the period the dust monitoring was compliant and no complaints of a dust nuisance were received. Dust suppression was deployed as required during the reporting period. Suppression was carried out using a tractor drawn water bauser, which wetted down the surface area of exposed ash. There were no non-compliances in relation to dust during the reporting period. Dust monitoring will be carried out at the same locations in 2011. The results of dust monitoring are attached in Appendix 1.

2.3.4 Noise

Noise monitoring is no longer scheduled as a parameter of the Licence monitoring regime, unless requested by the Agency.

2.3.5 Ground Water

Groundwater monitoring took place on a monthly basis, at bore wells MW02 – MW11. As was the case in 2009, due to cell development works, MW04 had become redundant. Wells MW08 – MW11 are bedrock wells, with 8 and 10 being up gradient and 9 and 11 down gradient. The remaining wells are overburden and only extend into the overburden peat. Appendix 2 contains graphs of monitoring results.

Comment:

In general ground water quality at the facility showed no great variation during the period. Elevated **ammonia** at MW2, MW3, MW5 & MW 6 can be expected as these are overburden wells located in peat. These four wells are located up gradient of the facility. Ammonia at the four bed rock wells was consistently below 4 mg/l.

Conductivity at the four bedrock wells was consistently below 1000 $\mu\text{S}/\text{cm}$, with only slightly elevated results in the overburden wells. The highest being 1115 $\mu\text{S}/\text{cm}$ at MW03 which is up gradient of the facility and representative of background levels. Although elevated in comparison with other groundwater monitoring locations, results were still within the I/PV of 2500 mg/l,- Drinking Water Directive. Following the repairs to the lagoon in 2009, conductivity levels at MW 11 have demonstrated a continuous reduction.

pH values at all wells have been satisfactory, with the more acidic overburden wells giving expected slightly lower pH values. The pH values ranged from 6.42 to 8.23 pH units. In general pH values have been consistent since sampling began.

Sulphate results were elevated at MW03 as was the case in 2009. As mentioned above this is an overburden well up gradient of the facility. However the highest recorded result of 108.7 mg/l is still within the I/PV of 250 mg/l,- Drinking Water Directive. Ground water **levels** have remained constant, with an expected season dip occurring in August.

Following representations from the Agency all results are now demonstrated in tabular form with graphs showing trends from 2008 also attached.

The tables and graphs are attached in appendix 2

2.3.6 Surfacewaters

Surface water monitoring took place on a quarterly basis with visual inspections carried out weekly. The monitoring locations were at SW4, SW5, SW6, SW7 and SW8.

SW4 is immediately downstream of the leachate lagoon outlet L2, SW8 is half way to the confluence of the East / West drain with the river and SW7 is at the confluence. SW5 and SW6 are up and down stream of the confluence respectively.

Comment:

With the exception of one occasion at SW4, results clearly show that **pH** levels in the Figile River at SW 5 (upstream), are consistently above levels recorded at the site, with no great variation between the upstream and downstream recordings at SW6. Additional monitoring at SW4 also took place during discharge events from the leachate lagoon at L2.

Suspended solids remained within emission limit values during the monitoring period. Although within emission limits, slightly elevated results were recorded at SW4, however results at SW8 and SW7 during the same monitoring event indicate a marked reduction in suspended solids.

Ammonia results were all below the I/PV of 4mg/l for A3 Waters. Results were of the range 0.03 mg/l and 0.75 mg/l.

COD results, with the exception of one peak of 108 mg/l at SW4, were below the Bord na Mona set trigger levels of 100 mg/l. The I/PV is 40 mg/l for A3 Waters. Results were of the range 47 mg/l and 72 mg/l. Background COD levels in the Figile River at SW5 and SW6 appear to have decreased during the period.

Following representations from the Agency all results are now demonstrated in tabular form with graphs showing trends from 2008 also attached.

The tables and graphs are attached in appendix 2

2.3.7 Discharges To Surfacewater

Discharge to surfacewater monitoring took place at SWR1. This is located at the exit to the surface water runoff silt settlement pond and the frequency was quarterly.

Comment:

As is evident from the graph attached, **pH** values have remained constant, with all results being within the emission limit values of 6 – 10 pH units.

COD results were below Bord na Mona set trigger levels of 100 mg/l and showed a marked reduction during the reporting period.

Ammonia results were all below the I/PV of 4mg/l for A3 Waters and again showed a marked reduction during the reporting period.

Suspended Solid results were all within the emission limit value of 35 mg/l.

Following representations from the Agency all results are now demonstrated in tabular form with graphs showing trends from 2008 also attached. The tables and graphs are attached in appendix 2

2.3.8 Leachate

Leachate monitoring took place at the sumps, LC1A, LC2A , LC3A and LC3B. Monitoring also took place at the leachate lagoon L1. The monitoring frequency was bi-annual. All locations are afforded the protection of a 2mm thick high density polyethylene lining system. The sump in active cell 3B was included in the second monitoring event 2010.

Comment:

As is normal, all parameters were elevated at each of the monitoring locations. LC1A, LC2A, LC3A and LC3B, which are located within fully lined cells and are contained. A similar situation pertains to L1, which is a fully lined Lagoon and is also designed for total containment. However, the management of leachate at the site again proved difficult due to the limits on leachate discharge rates. Additional capping does appear to have reduced the ingress of surface water into the body of the waste, however further investigations as to how best to further reduce the ingress will continue in 2011 with the assistance of Bord na Mona Innovation.

2.3.9 Leachate Discharge:

Leachate discharge monitoring took place at L2. This is the outlet point of the leachate lagoon and the monitoring frequency was quarterly, however an additional monitoring event took place in error, the results of which are also included.

Comment:

COD values were below Bord na Mona set trigger levels of 100 mg/l. With the exception of one peak of 80 mg/l results showed a downward trend on previous years.

Ammonia also showed a decrease over the period, with results well below the I/PV of 4mg/l for A3 Waters. Results were of the range 0.02 mg/l and 0.97 mg/l.

Conductivity remained constant over the five monitoring events with all results below 1000 µS/cm.

pH values ranged from 8.4 to 9.4 pH units. This has remained constant over the past two reporting periods.

Suspended Solids have also been consistent over the past two reporting periods with results being below 20 mg/l.

Dissolved Oxygen % showed a downward trend over the period while **Dissolved Oxygen mg/l** appeared to be constant during monitoring events.

Outside of the scheduled leachate discharge monitoring, additional leachate discharge monitoring also took place during all discharge events as per the Leachate Management Plan.

This monitoring took place both before and during each leachate discharge event from L2.

During these discharge events, all emission limit values had to be satisfied prior to any discharge.

The estimated total volume of leachate generated was approximately 4,400 m³ which following dilution resulted in a discharged volume of 31,815 m³ of treated effluent.

The results of additional discharge monitoring are retained on file at the site office.

Following representations from the Agency all results are now demonstrated in tabular form with graphs showing trends from 2008 also attached.

The tables and graphs are attached in appendix 2

Monitoring Locations are attached in appendix 3

2.3.10 Meteorology

Meteorological data was gathered from the Agency agreed weather station at Derrygreenagh Works, 10 km from the facility. September proved to be the wettest month, with 169.3mm of rainfall recorded and April proved to be the driest, with 37.3mm.

Below is a table containing all the gathered met data for 2010.

MONTHLY VALUES OF ELEMENTS AT MIDLAND SITES IN 2010

air temperature MSL CBL

| | rainfall | mean max. | mean min. | mean pressure | mean pressure | mean R.H. |
|-----------|----------|-----------------|--------------|------------------|------------------|--------------|
| January | 47.0 | 4.9 | -1.5 | 1015.5 | 1002.9 | 93.4 |
| February | 40.5 | 6.3 | -1.0 | 1004.0 | 991.5 | 92.1 |
| March | 78.1 | 10.4 | 1.1 | 1015.3 | 1002.8 | 82.3 |
| April | 37.3 | 14.6 | 1.7 | 1018.3 | 1005.9 | 79.1 |
| May | 41.9 | 16.9 | 5.4 | 1019.0 | 1006.7 | 77.3 |
| June | 56.9 | 21.1 | 9.6 | 1018.0 | 1005.9 | 78.6 |
| July | 123.7 | 20.0 | 11.4 | 1012.2 | 1000.2 | 85.0 |
| August | 44.2 | 18.9 | 9.5 | 1014.8 | 1002.6 | 83.7 |
| September | 169.3 | 17.6 | 9.0 | 1012.8 | 1000.7 | 87.4 |
| October | 72.0 | 14.0 | 4.9 | 1010.7 | 998.4 | 89.2 |
| November | 113.0 | 8.4 | 0.9 | 1004.9 | 992.5 | 91.5 |
| December | | 2.9 | -4.9 | 1016.6 | 1003.8 | 94.3 |
| | mm. | degrees Celsius | | hectoPascals | | % |

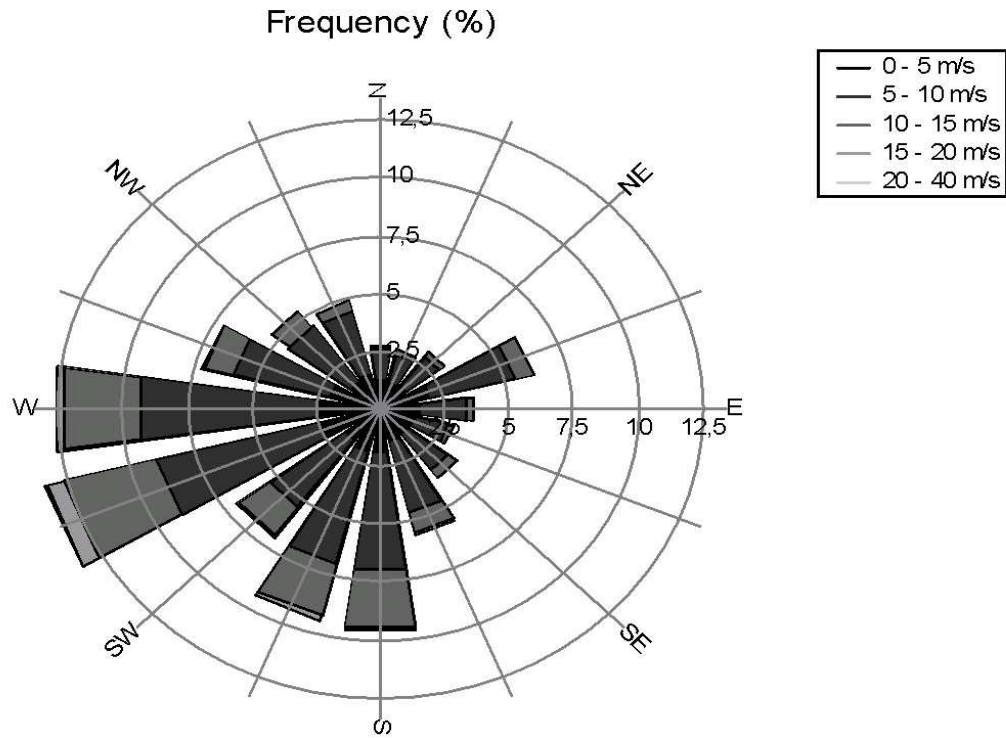
Rainfall and temperature from Derrygreenagh

Pressure and humidity from Mullingar

MSL: corrected to mean sea level

CBL: barometer level

Wind Atlas for the Cloncreen Area



Comment:

A wind-rose for the period was unavailable for inclusion in this report. The image above is generated from a wind atlas of Ireland and is representative of the Cloncreen area. It is not directly based on any measurements; rather it is based on a predictive model of the wind regime for the country, which has been checked against actual data when its accuracy was being assessed.

2.4 Energy Consumption

Diesel is used in the every day operation, of ash transportation, placement and dust suppression. It is envisaged that these figures will remain constant as long as there isn't a change in the plant used at the facility. The electricity usage at the facility extends to approximately 1300 kwh/year.

| Machine Type | Consumption Litres/Week | Annual Consumption Megawatt/Hours | Annual Consumption Litres |
|-----------------|-------------------------|-----------------------------------|---------------------------|
| Locomotive | 600 | 317.02 | 31200 |
| Frontend Loader | 954 | 504.07 | 49608 |
| Tractor | 272 | 143.72 | 7072 |
| Bulldozer | 480 | 253.62 | 12480 |
| Excavator | 480 | 253.62 | 12480 |
| Diesel Pump | 50 | 26.42 | 2600 |
| Totals | 2836 | 1498.46 | 115440 |

2.4.1 Energy Efficiency Audit Report

An energy efficiency audit was carried out at the facility in 2007. As operations at the facility and the ash transportation and placement equipment are unchanged, all aspects of energy efficiency remain the same. Should there be a change in operations, the most efficient means of carrying out such operations will be reassessed and included in future AER's.

2.5 Environmental Expenditure.

| Environmental Expenditure 2010 | |
|--------------------------------|--------------------|
| Description | Cost € |
| Operating Costs | |
| Material | 16,798 |
| Wages | 145,733 |
| Monitoring Costs | |
| Analysis & Reports | 19,880 |
| EPA Fees | |
| Fee Payable to EPA | 15,204 |
| Total | €197,614.51 |

2.6 Environmental Incidents & Complaints.

| Environmental Incidents 2010 | | |
|------------------------------------|--|----------|
| Licence: W0049-02 | | |
| Works: Clonbullogue Ash Repository | | |
| | | Number |
| Incidents | | 3 |
| Requiring corrective action | | 3 |
| Category | | |
| Water | | 2 |
| Air | | |
| Procedural | | 1 |
| Miscellaneous | | |
| Total | | 3 |

Note: The above incidents are actual non – compliances. Two were in relation to the findings of an Agency audit and one was in relation to elevated pH from a lagoon discharge event of which the Agency was informed. The audit findings included leachate levels above 1 meter in leachate sumps and the non completion of a slope stability test.

| Environmental Complaints 2010 | |
|------------------------------------|--------|
| Licence:W0049-02 | |
| Works: Clonbullogue Ash Repository | |
| | Number |

| | | | |
|-----------------------------|--|--|----------|
| Complaints | | | 0 |
| Requiring corrective action | | | 0 |
| Category | | | |
| Water | | | |
| Air | | | |
| Procedural | | | |
| Miscellaneous | | | |
| Total | | | 0 |

Note: No complaints of an environmental nature were received during the reporting period.

Section 3: Environmental Management

3.1 Management & Staffing Structure

Environmental Management System Management Structure (Condition 2.6)

Management Structure (including Environmental Emergency Response Team)

Resource Manager (1)

(Resource Assistant) (2)
Transport / Quality Manager

Environmental Co-ordinator (3)

- (1) Overall responsibility rests with the Resource Manager.
- (2) Day to Day Transport Management (Based at the Power Station Office)
- (3) Site Management, Monitoring, Records, Reports and Inspections

| <i>Position</i> | <i>Duties & Responsibilities</i> | <i>Experience/Qualifications</i> |
|---|--|---|
| Resource Manager | Overall responsibility for the ongoing management of the site and maintenance of the waste licence. Delegation of authority and responsibility to ensure the effective management of the facility. | Resource Manager since 2007 Previously held other management positions. With Bord na Mona since 1977. |
| Resource Assistant Transport / Quality Manager | Responsibility for the transportation of ash to the facility as directed by the Resource Manager. The transport manager is based at the Power Station for the majority of the time. | Quality Manager, Derrygreenagh Works for 21 years with responsibility for transport of peat / ash and peat quality. |
| Environmental Co-Coordinator | Responsibility for the day to day implementation of routine compliance monitoring, maintenance of all environmental records and the environmental file and preparation of environmental reports as directed by the Resource Manager. | Environmental Co-ordinator Derrygreenagh for 4½ years. Previous experience as a supervisor in Bord na Mona for 5 years. Holder of National Skills Cert- Waste Management. |

3.2 Raw Material / Waste Management Efficiency

The only raw materials used on site are those used in the construction of cell embankments as they are required.

3.3 Water Demand / Trade Effluent Management

The only water used on site is collected surface water runoff which is used in the management of leachate and dust suppression.

There is no domestic water connection at the facility.

Leachate quantities are being reduced by the placement of additional capping as per project 4 of the Environmental Management Programme.

3.4 Site Development Works.

3.4.1 Development Works Undertaken during the Reporting period

Cell 4 Floor Formation.

The cell floor was developed to the specification set out in the licence review application documentation as submitted to the Agency.

Cell 4 Embankments

Initial placement of cell embankment material took place with 60% of the embankments in place on all sides.

Capping.

Additional capping material was placed to help reduce the ingress of surface water into the already capped cells one and two.

3.4.2 Proposed Development Works for 2011

It is proposed to continue with the development of cell 4. Works will include the continued development of the cells embankments. Capping will also commence on a portion of cell Three A. Additional capping may also be placed on cells one and two to further reduce the ingress of surface water.

3.5 Restoration of Completed Cells/Phases

An ecological survey of the capped cell 1 and cell 2 was carried out by Bord na Mona's Land Development Manager, the findings of which are outlined below. This survey was carried out in March 2011 but is included in this report for the purposes of fulfilling the requirements of the AER.

The site was visited the site on 10th march and all the old vegetated areas are firmly established with a strong tussocky growth of grass and also with strong scrub growth of gorse and also birch in places. Work is ongoing in the hollows between the cells and an open drainage system has been installed to cater for runoff. The spoil has been levelled from these excavations and will need to be seeded this Spring, to re-establish vegetation cover and also on the machine passes and once

this is done then the vegetation cover will be 100%. Work is ongoing on spreading subsoil on the newer areas and all this looks very satisfactory for grass establishment also.

3.5.1 Topographical Survey

Site Survey

A site survey was carried out in early 2009. This survey formed part of the Specified Engineering Works proposal sent to the Agency in relation to the lining of the remaining half of cell 3.

3.6 Achievement of Objectives & Targets 2010

| Project | Description & Status |
|---|--|
| <p>Project 1: Conduct all operations on site in accordance with the schedules and conditions of the waste licence and also in conjunction with the restoration and aftercare programme</p> | <p>Achieved.</p> <p>All operations on site were carried out in accordance with the schedules and conditions of the waste licence and also in conjunction with the Restoration & Aftercare programme.</p> |
| <p>Project 2: Future cell development</p> | <p>Achieved</p> <p>The floor of cell 4 was constructed to the required specification. Cell embankment construction also commenced.</p> |
| <p>Project 3: Seed the remainder of capped cell 2</p> | <p>Not Achieved</p> <p>This work was delayed.</p> |
| <p>Project 4: Leachate Management Plan</p> | <p>Ongoing</p> <p>Additional capping was placed to reduce the ingress of water into the capped cells thus reducing the amounts of leachate produced.</p> |
| <p>Project 5: Alternative Use</p> | <p>Ongoing.</p> <p>Bord na Mona Innovation have been tasked with finding an alternative use for the ash as well as a more efficient leachate treatment system.</p> |

Proposed Environmental Objectives & Targets for 2011

| Project | Description & Status |
|--|--|
| Project 1: Conduct all operations on site in accordance with the schedules and conditions of the waste licence and also in conjunction with the restoration and aftercare programme | Continue to conduct all operations on site in accordance with the schedules and conditions of the waste licence and also in conjunction with the Restoration & Aftercare programme. |
| Project 2: Future cell development | Continue with the development of cell 4, to the specification set out in the review. |
| Project 3: Seed the remainder of capped cell 2 | Grass seed the remaining section of capped cell 2 and a portion of cell 3A. |
| Project 4: Leachate Management Plan | Carry out a comprehensive survey of the existing capping systems of cells 1 and 2. Depending on findings, additional capping may be introduced to further enhance the existing caps. |
| Project 5: Alternative ash / leachate use | Continue with research for alternative use's / re-use's of ash waste and leachate. |

3.7 C.R.A.M.P. / E.L.R.A. Review

The CRAMP / ELRA assessment was reviewed by Bord na Mona Environmental Limited in October 2010 the findings of which will be submitted once appropriate financial measures are agreed with the Agency.

3.8 Mass Balance of Construction Material

Cell embankments were constructed to approximately 60% of final finished profile. The material used was sourced from the material excavated in the formation of the cell floors. Should additional material be required it will be sourced to the west of cell 4 on the footprint of cell 5.

3.9 Slope Stability Assessment Report

Several permanent markers were installed along the embankments and surveyed. These markers will be surveyed intermittently into the future with results used to determine the stability of the embankments. The stability assessment report will be resubmitted with a revised 2009 AER as requested by the Agency.

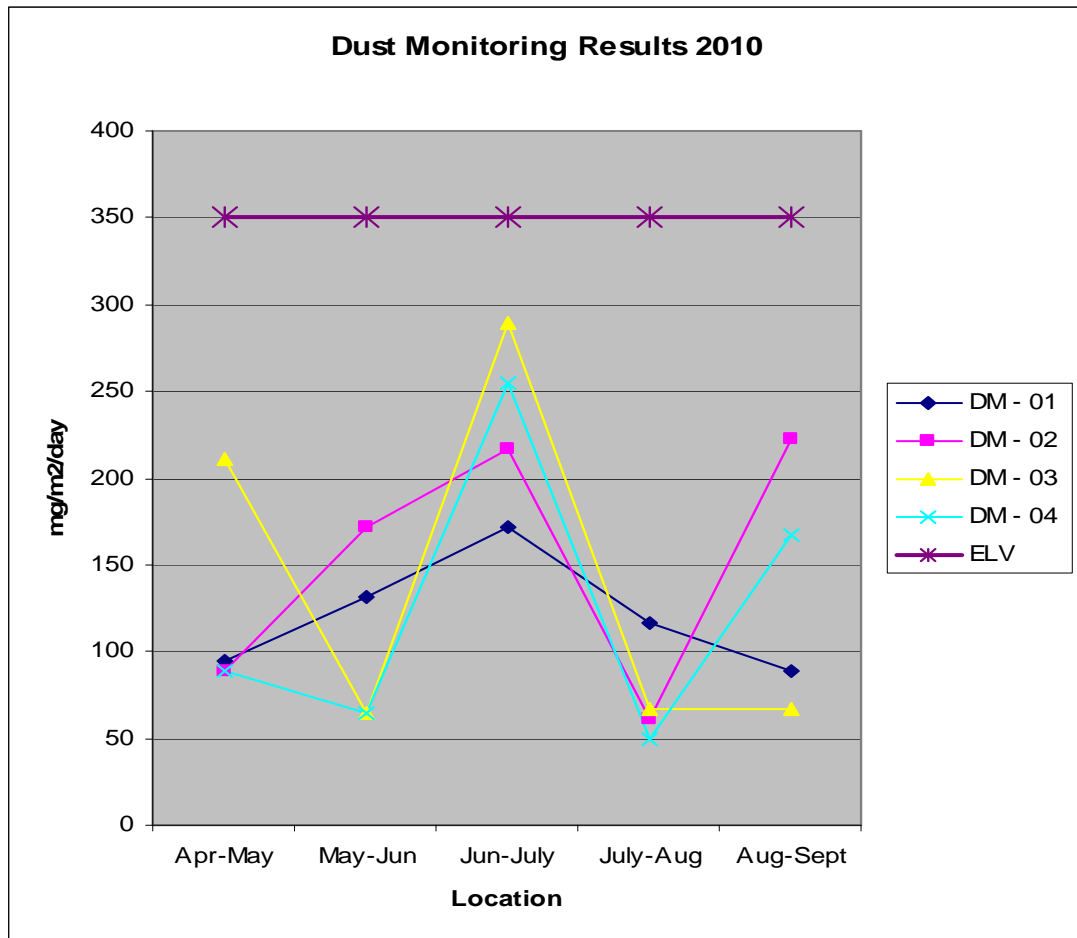
3.10 Programme for Public Information

The Bord na Mona Energy Ltd site office at the Power Station, is the main ash site office for keeping all the records associated with the ordinary day to day operation of the landfill and the Waste Licence. Documents kept here include the Annual Environmental Report, Environmental Management Programme, Schedule of Objectives and Targets, all Monitoring Data, ash tonnages and volumes, Emergency Response Procedure, Bord na Mona Energy LTD's, Environmental Policy. Any individual wishing to view these documents may call to the office during working hours.

Appendix 1

Dust Monitoring Results

| Dust Monitoring Results 2010 | | | | |
|------------------------------|---------|---------|---------|---------|
| Sample Period | DM - 01 | DM - 02 | DM - 03 | DM - 04 |
| Apr-May | 94 | 89 | 211 | 89 |
| May-Jun | 131 | 172 | 65 | 65 |
| Jun-July | 172 | 217 | 289 | 255 |
| July-Aug | 117 | 61 | 67 | 50 |
| Aug-Sept | 89 | 222 | 67 | 167 |



Note: Emission Limit Value = 350 mg/m²/day. There were no dust non-compliances or complaints of a dust nuisance during the reporting period.

Appendix 2

Water Monitoring Results

Ground Water

| Monitoring Location: MW02 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 68.502 | 68.502 | 68.502 | 68.402 | 67.902 | 67.902 | 68.352 | 67.852 | 68.452 | 68.552 | 68.552 | 68.502 |
| pH (pH units) | Monthly | 7.4 | 7.5 | 7.2 | 7.7 | 7.6 | 7.5 | 7.6 | 7.3 | 7.4 | 7.4 | 7.4 | 7.4 |
| Electrical Conductivity (µS/cm) | Monthly | 665 | 628 | 628 | 630 | 643 | 709 | 677 | 759 | 701 | 774 | 649 | 668 |
| Total Ammonia | Monthly | 6 | 5.9 | 6 | 6.2 | 5.9 | 6.2 | 5.8 | 6.5 | 6.3 | 6.3 | 6.2 | 6.2 |
| Sulphate(SO4) | Monthly | 2.7 | 1.96 | 1.6 | 1.8 | 1.22 | 1.17 | 1.94 | 1.77 | 1.69 | 1.06 | 2.07 | 1.33 |

| Monitoring Location: MW03 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 68.356 | 67.756 | 67.606 | 67.756 | 67.406 | 67.456 | 67.906 | 67.406 | 68.006 | 67.406 | 68.256 | 67.756 |
| pH (pH units) | Monthly | 6.8 | 7.1 | 7 | 7.1 | 6.9 | 6.8 | 7.1 | 6.8 | 6.8 | 6.9 | 7.1 | 6.9 |
| Electrical Conductivity (µS/cm) | Monthly | 937 | 990 | 921 | 946 | 978 | 1024 | 982 | 999 | 1115 | 1084 | 632 | 1015 |
| Total Ammonia | Monthly | 2.85 | 4.08 | 4.35 | 4.16 | 4.2 | 4.6 | 4.24 | 4.55 | 3.53 | 3.83 | 0.18 | 2.21 |
| Sulphate(SO4) | Monthly | 71.67 | 84.64 | 82.79 | 79.88 | 76.9 | 75.93 | 82.2 | 80.88 | 87.1 | 105.86 | 86.2 | 108.57 |

| Monitoring Location: MW05 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 66.684 | 66.584 | 66.584 | 66.534 | 66.284 | 66.384 | 66.584 | 66.384 | 66.584 | 66.584 | 66.634 | 66.584 |
| pH (pH units) | Monthly | 7.1 | 7.1 | 7.1 | 7.3 | 7.1 | 7 | 7.6 | 7.1 | 7.1 | 7 | 7 | 7 |
| Electrical Conductivity (µS/cm) | Monthly | 719 | 699 | 680 | 689 | 728 | 783 | 706 | 721 | 708 | 732 | 655 | 715 |
| Total Ammonia | Monthly | 6.7 | 6.4 | 6.4 | 6.4 | 6.5 | 6.1 | 6.5 | 6.1 | 6.3 | 6.4 | 6.1 | 6.4 |
| Sulphate(SO4) | Monthly | 2.9 | 1.9 | 1.43 | 1.35 | 2.98 | 1.83 | 1.79 | 0.52 | 0.75 | 0.82 | 0.66 | 0.72 |

| Monitoring Location: MW06 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 68.163 | 68.113 | 68.063 | 69.163 | 67.963 | 67.913 | 68.063 | 67.863 | 68.113 | 68.113 | 68.213 | 68.113 |
| pH (pH units) | Monthly | 7 | 7 | 7 | 7.2 | 6.9 | 6.9 | 7.3 | 6.8 | 6.9 | 7 | 7 | 6.9 |
| Electrical Conductivity (µS/cm) | Monthly | 544 | 580 | 557 | 548 | 583 | 620 | 592 | 600 | 561 | 599 | 506 | 556 |
| Total Ammonia | Monthly | 6.7 | 6.7 | 6.8 | 6.5 | 6.9 | 6.5 | 6.7 | 6.7 | 6.3 | 6.4 | 6.4 | 6.4 |
| Sulphate(SO4) | Monthly | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |

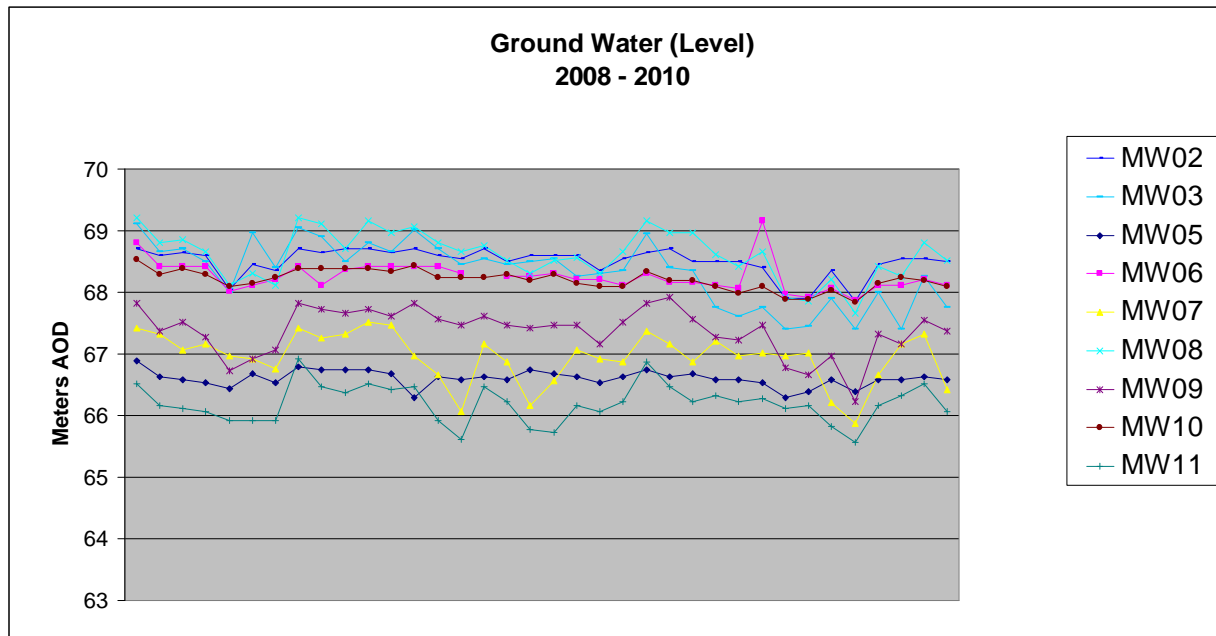
| Monitoring Location: MW07 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 66.866 | 67.216 | 66.966 | 67.016 | 66.966 | 67.016 | 66.216 | 65.866 | 66.666 | 67.166 | 67.316 | 66.416 |
| pH (pH units) | Monthly | 7 | 6.9 | 7 | 7.2 | 6.9 | 6.9 | 7.3 | 6.9 | 6.9 | 6.9 | 7 | 6.9 |
| Electrical Conductivity (µS/cm) | Monthly | 763 | 772 | 770 | 738 | 756 | 844 | 839 | 799 | 921 | 945 | 810 | 792 |
| Total Ammonia | Monthly | 2.04 | 2.18 | 2.2 | 2.06 | 2.1 | 2.41 | 2.16 | 2.42 | 1.84 | 2.41 | 1.75 | 2.26 |
| Sulphate(SO4) | Monthly | 10.95 | 11.16 | 9.62 | 10.81 | 6.15 | 3.66 | 11.62 | 7.11 | 23.12 | 11.37 | 16.31 | 9.2 |

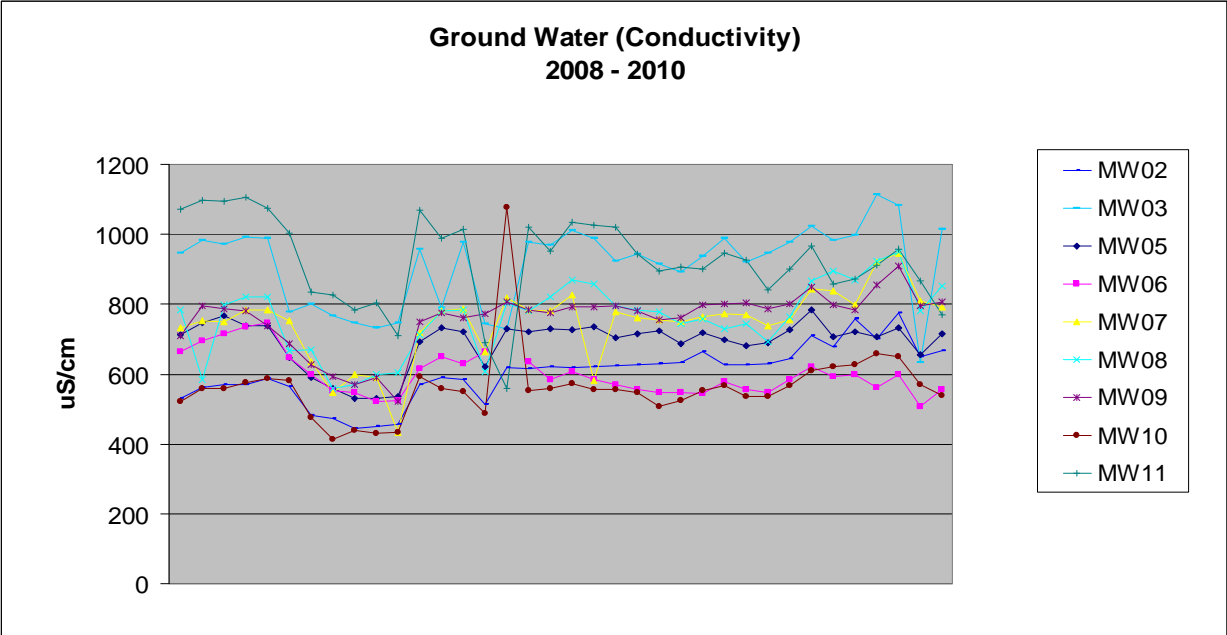
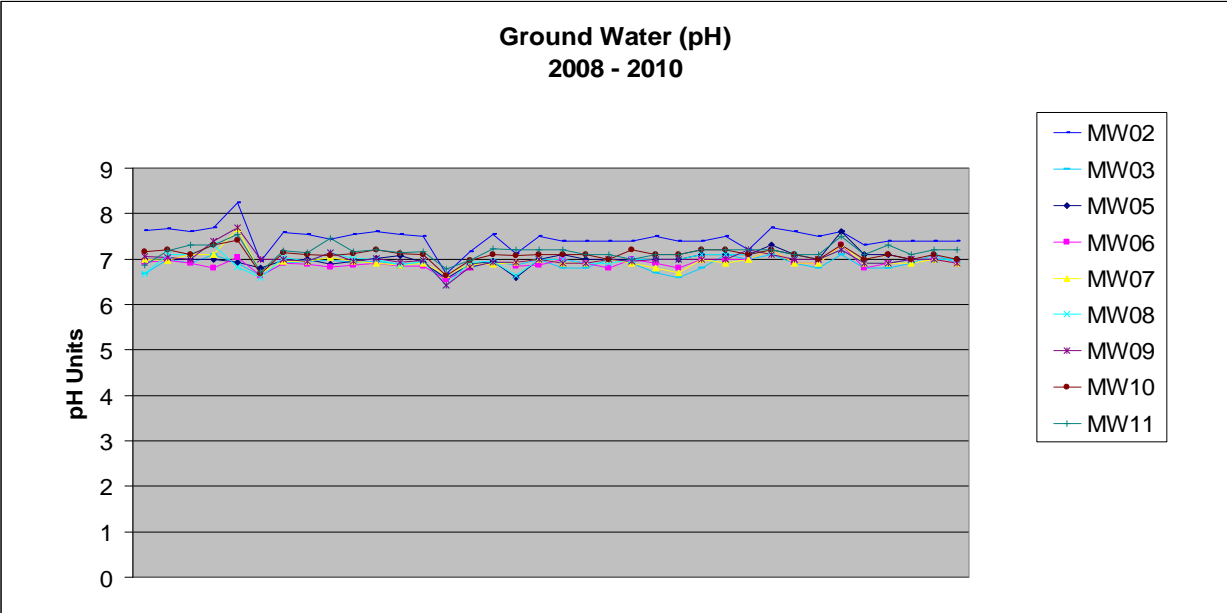
| Monitoring Location: MW08 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 68.962 | 68.612 | 68.412 | 68.662 | 67.912 | 67.862 | 68.212 | 67.662 | 68.412 | 68.252 | 68.812 | 68.512 |
| pH (pH units) | Monthly | 7.1 | 7.1 | 7.1 | 7.2 | 7.1 | 7 | 7.2 | 6.9 | 6.9 | 7 | 7 | 7 |
| Electrical Conductivity (µS/cm) | Monthly | 757 | 730 | 745 | 694 | 763 | 867 | 894 | 869 | 924 | 949 | 781 | 852 |
| Total Ammonia | Monthly | 0.49 | 0.9 | 1.77 | 0.6 | 1.5 | 2.64 | 2.32 | 2.96 | 2.3 | 3.6 | 0.7 | 2.45 |
| Sulphate(SO4) | Monthly | 82.8 | 67.97 | 69.7 | 64.59 | 61.06 | 60.84 | 61.66 | 60.27 | 58.8 | 51.75 | 68.42 | 62.01 |

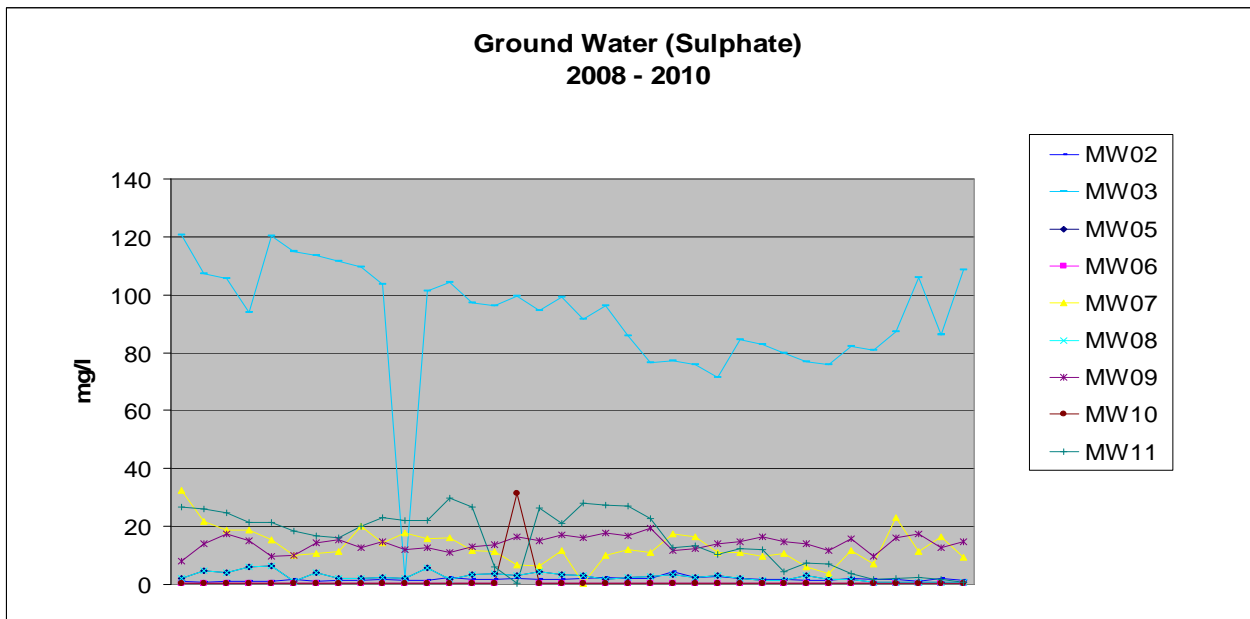
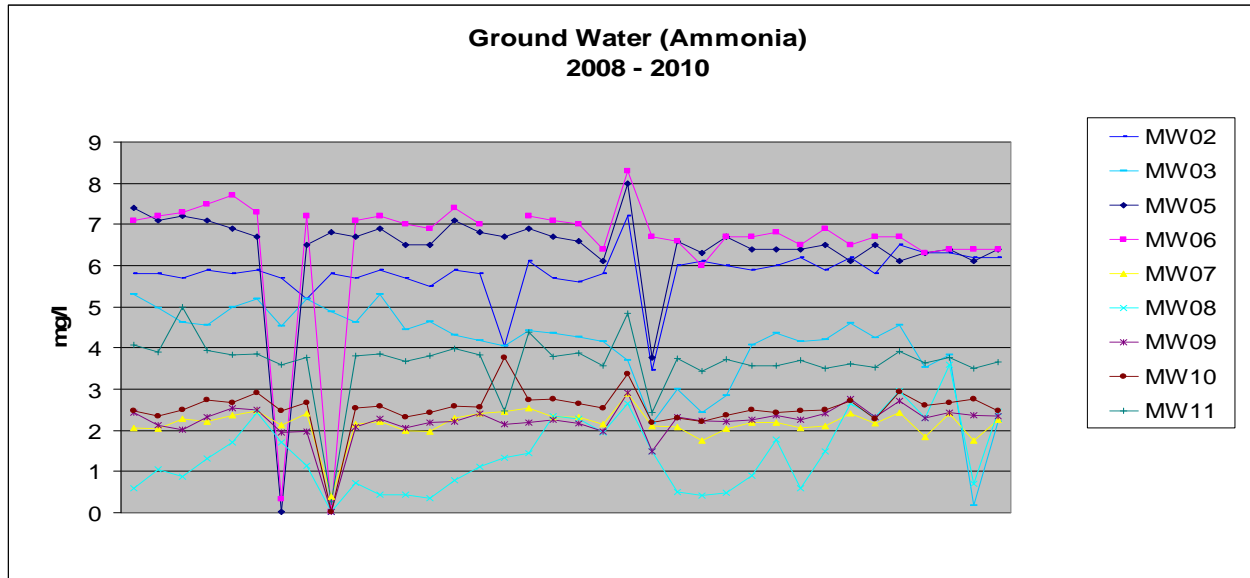
| Monitoring Location: MW09 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 67.568 | 67.268 | 67.218 | 67.468 | 66.768 | 66.668 | 66.968 | 66.218 | 67.318 | 67.168 | 67.548 | 67.368 |
| pH (pH units) | Monthly | 7 | 7 | 7.2 | 7.1 | 7 | 7 | 7.2 | 6.9 | 6.9 | 7 | 7 | 6.9 |
| Electrical Conductivity (µS/cm) | Monthly | 798 | 801 | 803 | 788 | 802 | 849 | 799 | 784 | 855 | 908 | 794 | 806 |
| Total Ammonia | Monthly | 2.21 | 2.26 | 2.37 | 2.26 | 2.4 | 2.76 | 2.33 | 2.72 | 2.3 | 2.43 | 2.36 | 2.34 |
| Sulphate(SO4) | Monthly | 13.95 | 14.64 | 16.51 | 14.86 | 14.1 | 11.75 | 15.68 | 9.81 | 16 | 17.21 | 12.8 | 14.59 |

| Monitoring Location: MW10 | | | | | | | | | | | | | |
|----------------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 68.19 | 68.09 | 67.99 | 68.09 | 67.89 | 67.89 | 68.04 | 67.84 | 68.14 | 68.24 | 68.19 | 68.09 |
| pH (pH units) | Monthly | 7.2 | 7.2 | 7.1 | 7.2 | 7.1 | 7 | 7.3 | 7 | 7.1 | 7 | 7.1 | 7 |
| Electrical Conductivity (µS/cm) | Monthly | 554 | 568 | 535 | 536 | 568 | 611 | 620 | 627 | 659 | 649 | 571 | 538 |
| Total Ammonia | Monthly | 2.36 | 2.49 | 2.43 | 2.48 | 2.5 | 2.71 | 2.28 | 2.93 | 2.6 | 2.68 | 2.76 | 2.48 |
| Sulphate(SO4) | Monthly | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |

| Monitoring Location: MW11 | | | | | | | | | | | | | |
|---------------------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Parameter | Date | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 |
| Groundwater level (m AOD) | Monthly | 66.219 | 66.319 | 66.219 | 66.269 | 66.119 | 66.169 | 65.819 | 65.569 | 66.169 | 66.319 | 66.519 | 66.069 |
| pH (pH units) | Monthly | 7.2 | 7.2 | 7.2 | 7.2 | 7.1 | 7.1 | 7.5 | 7.1 | 7.3 | 7.1 | 7.2 | 7.2 |
| Electrical Conductivity (µS/cm) | Monthly | 901 | 946 | 926 | 842 | 901 | 965 | 859 | 873 | 911 | 958 | 866 | 771 |
| Total Ammonia | Monthly | 3.73 | 3.56 | 3.57 | 3.69 | 3.5 | 3.61 | 3.52 | 3.91 | 3.64 | 3.76 | 3.5 | 3.66 |
| Sulphate(SO4) | Monthly | 10.36 | 12.48 | 12.08 | 4.18 | 7.19 | 7.09 | 3.8 | 1.83 | 2.12 | 2.28 | 1.53 | 0.56 |







SurfaceWater.

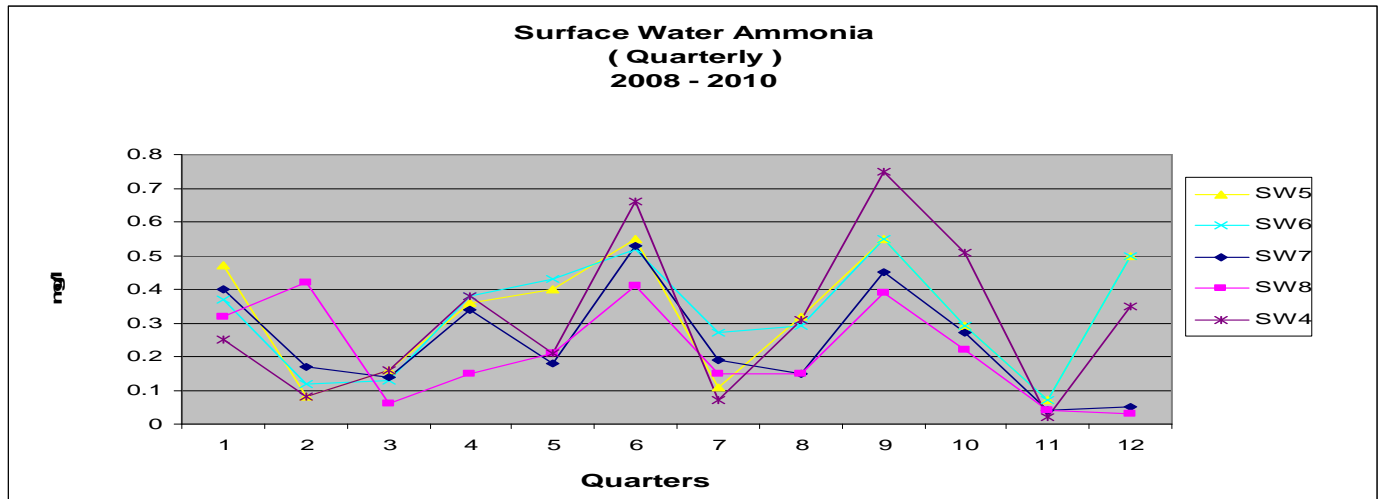
| Monitoring Location: SW4 | | | | | |
|---------------------------------|------------------|------------|------------|------------|------------|
| Parameter | Date | 15/02/2010 | 19/05/2010 | 30/08/2010 | 29/11/2010 |
| Ammonia | Quarterly | 0.75 | 0.51 | 0.02 | 0.35 |
| COD (mg/l) | Quarterly | 51 | 50 | 108 | 56 |
| pH (pH units) | Quarterly | 7.7 | 7.6 | 9.2 | 7.6 |
| Total Suspended Solids (mg/l) | Quarterly | 5 | 5 | 27 | 7 |

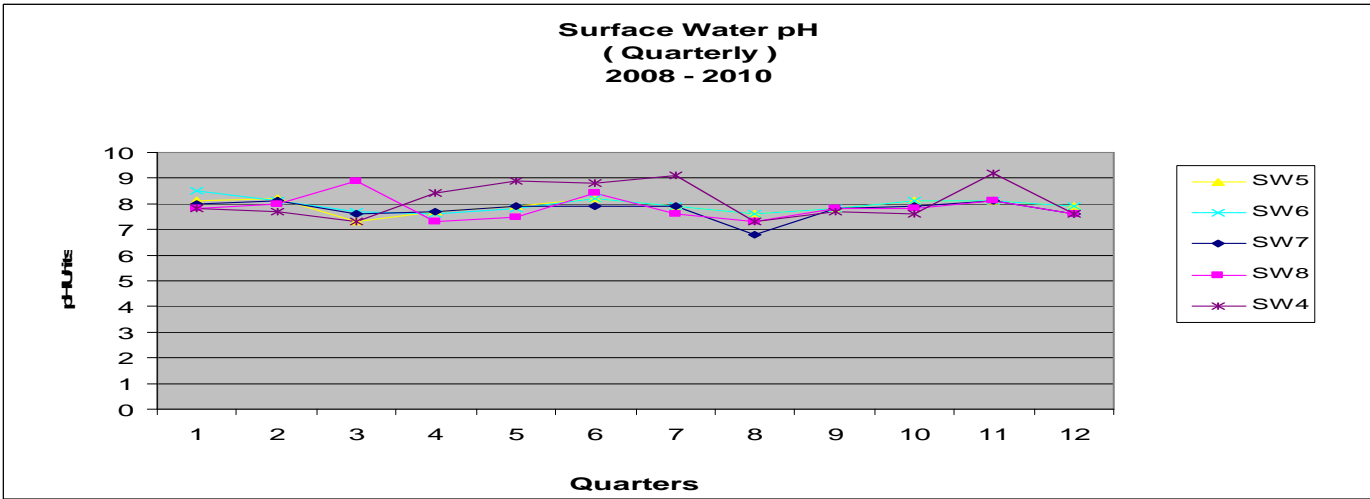
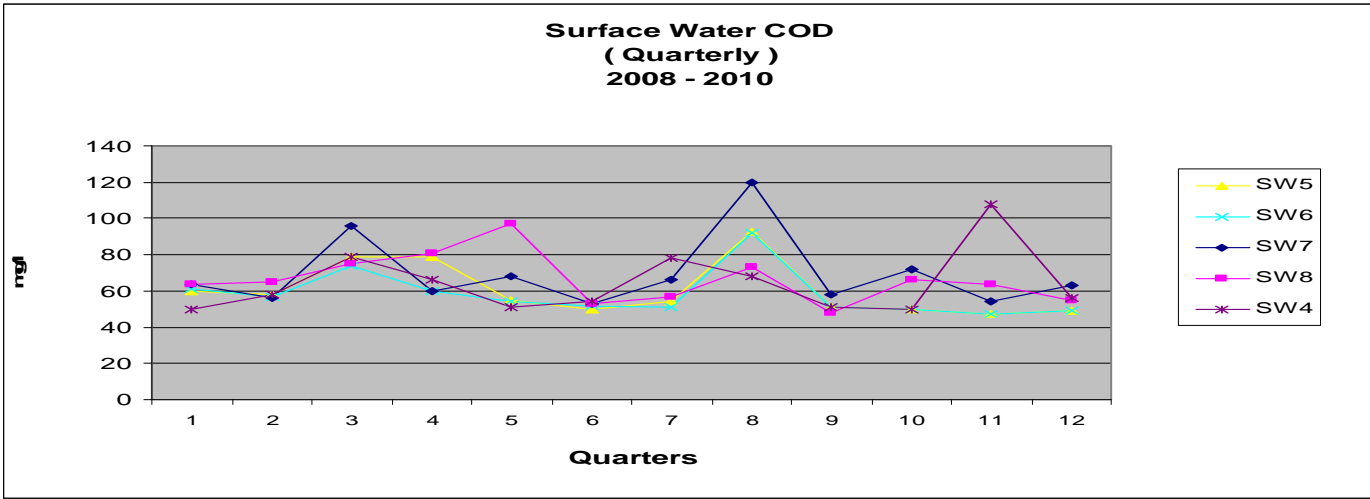
| Monitoring Location: SW5 | | | | | |
|---------------------------------|------------------|------------|------------|------------|------------|
| Parameter | Date | 15/02/2010 | 19/05/2010 | 30/08/2010 | 29/11/2010 |
| Ammonia | Quarterly | 0.55 | 0.29 | 0.07 | 0.5 |
| COD (mg/l) | Quarterly | 51 | 50 | 47 | 49 |
| pH (pH units) | Quarterly | 7.8 | 8.1 | 8.1 | 7.9 |
| Total Suspended Solids (mg/l) | Quarterly | 8 | 5 | 5 | 5 |

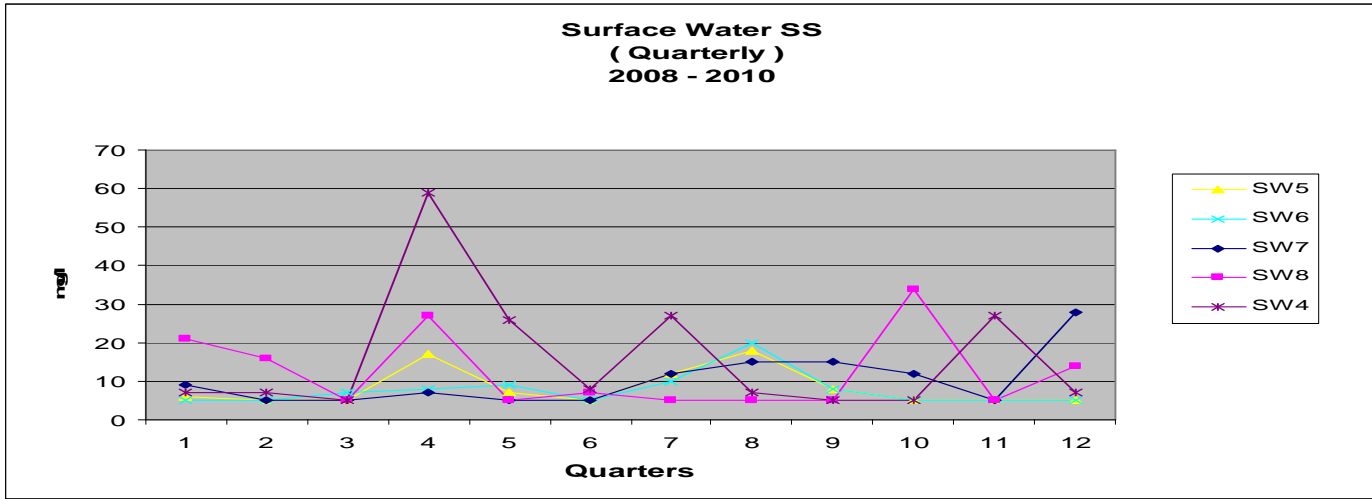
| Monitoring Location: SW6 | | | | | |
|---------------------------------|------------------|------------|------------|------------|------------|
| Parameter | Date | 15/02/2010 | 19/05/2010 | 30/08/2010 | 29/11/2010 |
| Ammonia | Quarterly | 0.55 | 0.29 | 0.07 | 0.5 |
| COD (mg/l) | Quarterly | 51 | 50 | 47 | 49 |
| pH (pH units) | Quarterly | 7.8 | 8.1 | 8.1 | 7.9 |
| Total Suspended Solids (mg/l) | Quarterly | 8 | 5 | 5 | 5 |

| Monitoring Location: SW7 | | | | | |
|---------------------------------|------------------|------------|------------|------------|------------|
| Parameter | Date | 15/02/2010 | 19/05/2010 | 30/08/2010 | 29/11/2010 |
| Ammonia | Quarterly | 0.45 | 0.27 | 0.04 | 0.05 |
| COD (mg/l) | Quarterly | 58 | 72 | 54 | 63 |
| pH (pH units) | Quarterly | 7.8 | 7.9 | 8.1 | 7.6 |
| Suspended Solids (mg/l) | Quarterly | 15 | 12 | 5 | 28 |

| Monitoring Location: SW8 | | | | | |
|---------------------------------|------------------|------------|------------|------------|------------|
| Parameter | Date | 25/02/2010 | 19/05/2010 | 30/08/2010 | 29/11/2010 |
| Ammonia | Quarterly | 0.39 | 0.22 | 0.04 | 0.03 |
| COD (mg/l) | Quarterly | 48 | 66 | 64 | 55 |
| pH (pH units) | Quarterly | 7.8 | 7.8 | 8.1 | 7.6 |
| Suspended Solids (mg/l) | Quarterly | 5 | 34 | 5 | 14 |

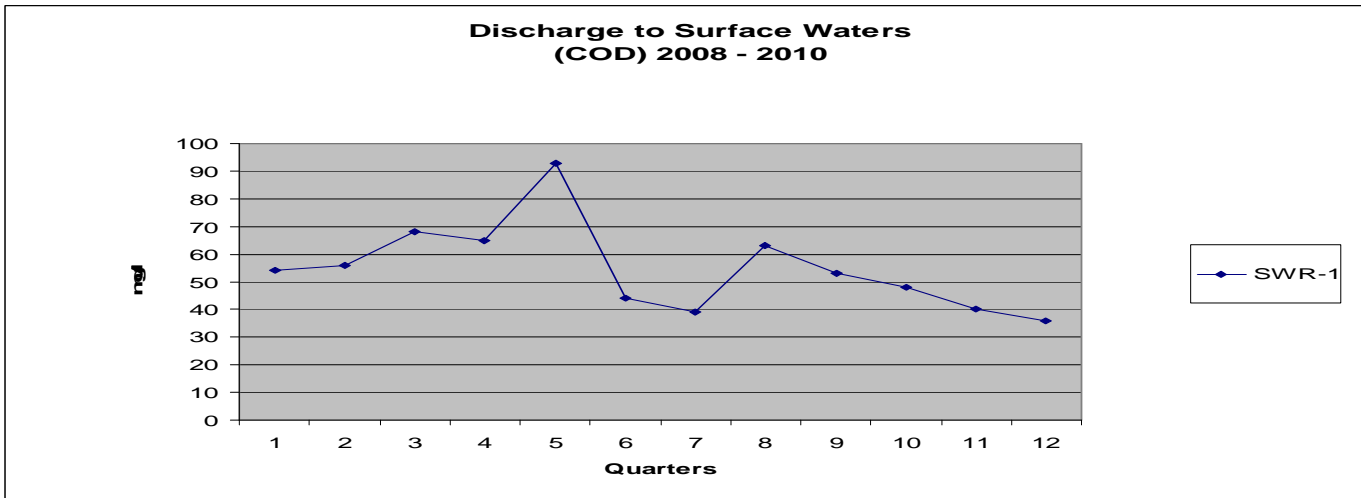
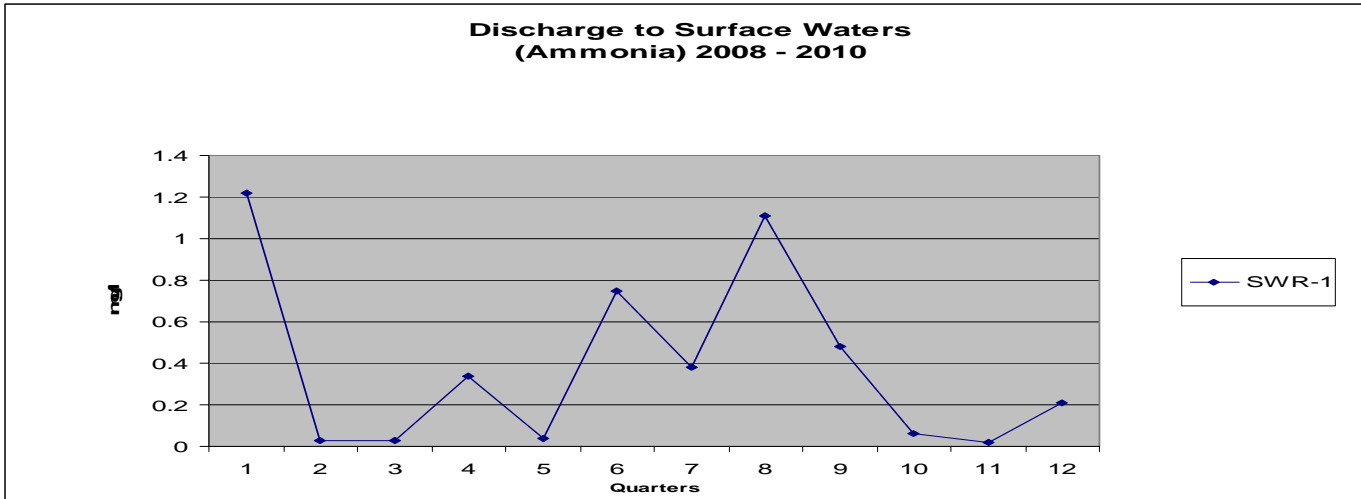


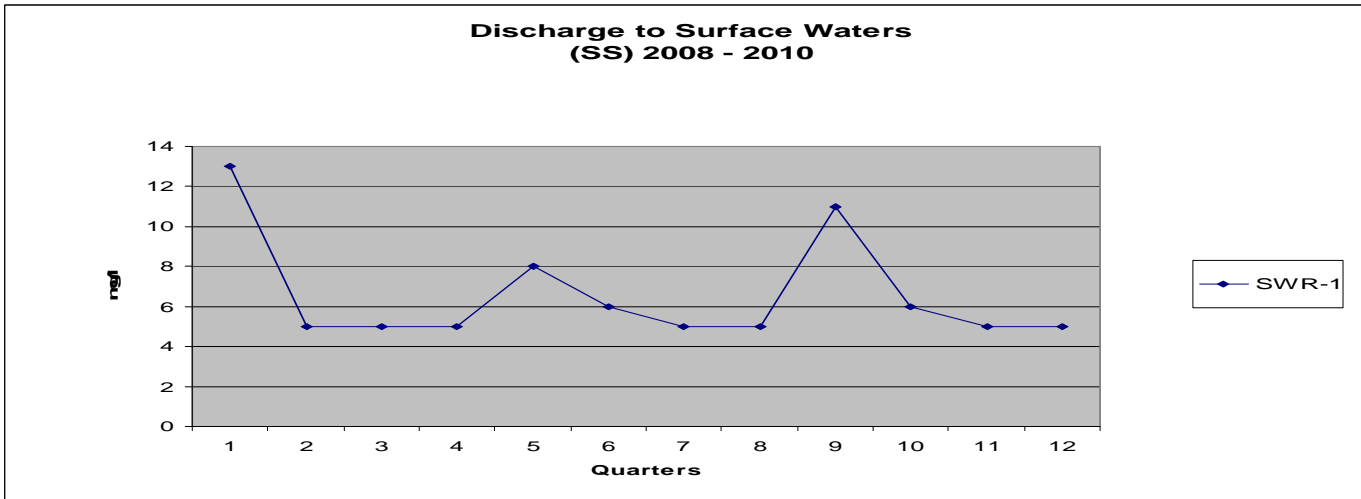
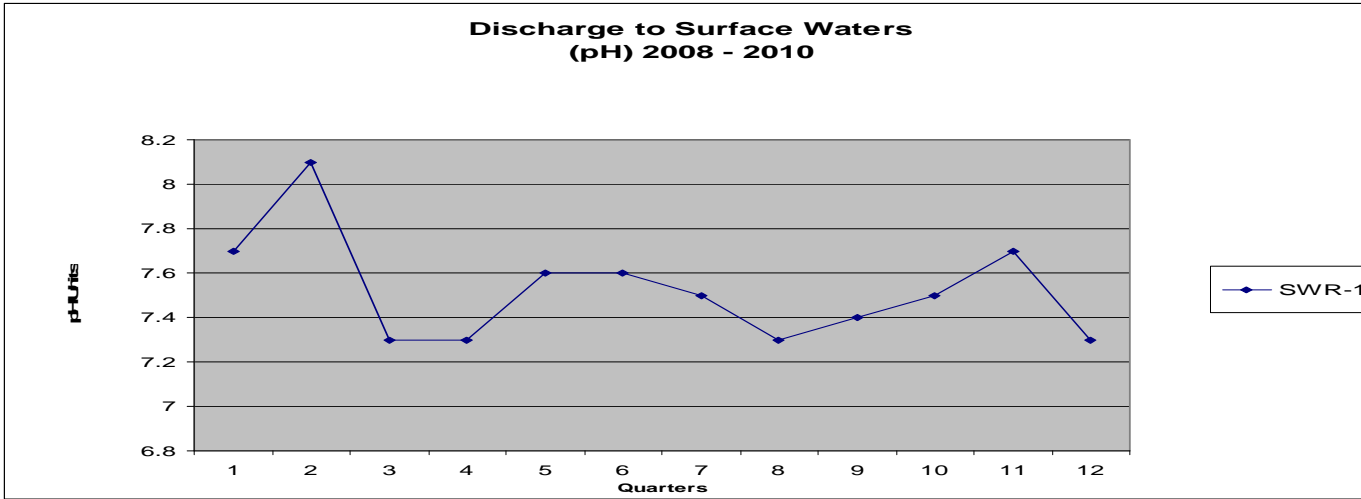




Discharges to Surface Waters.

| Monitoring Location: SWR1 | | | | | |
|----------------------------------|------------------|------------|------------|------------|------------|
| Parameter | Date | 25/02/2010 | 19/05/2010 | 30/08/2010 | 29/11/2010 |
| Ammonia | Quarterly | 0.48 | 0.06 | 0.02 | 0.21 |
| COD (mg/l) | Quarterly | 53 | 48 | 40 | 36 |
| pH (pH units) | Quarterly | 7.4 | 7.5 | 7.7 | 7.3 |
| Suspended Solids (mg/l) | Quarterly | 11 | 6 | 5 | 5 |





Leachate.

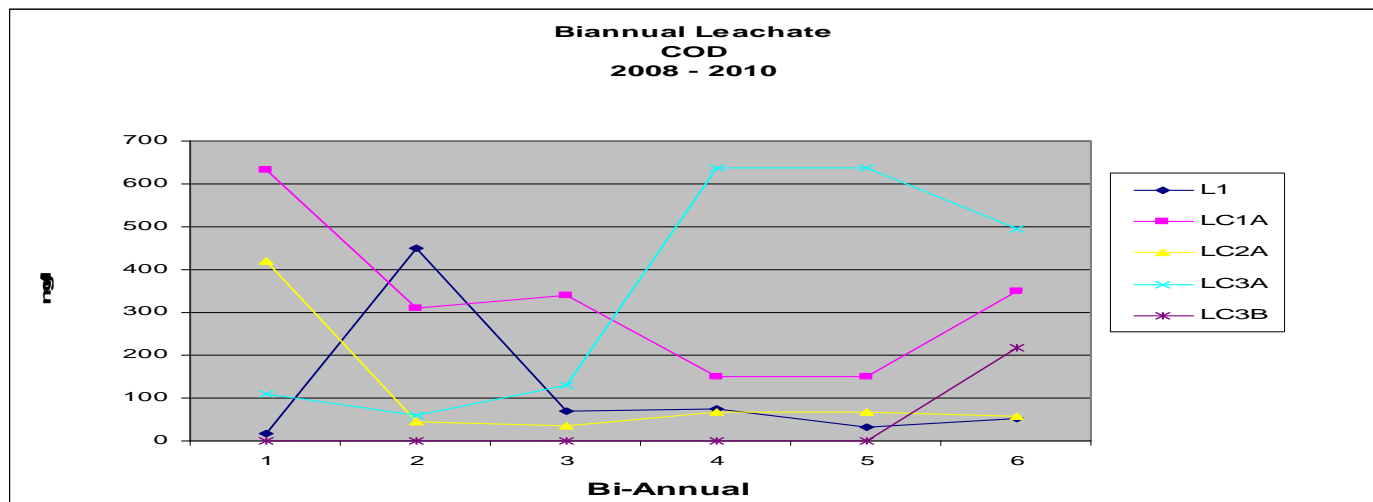
| Monitoring Location: L1 | | | |
|---------------------------------------|--------------------|------------|------------|
| Parameter | Date | 19/01/2010 | 26/07/2010 |
| COD (mg/l) | Bi-Annually | 33 | 53 |
| Amonical nitrogen (mg/l NH4) | Bi-Annually | 2.31 | 0.53 |
| Temperature (0C) | Bi-Annually | 9.5 | 11.1 |
| Electrical Conductivity (μ S/cm) | Bi-Annually | 886 | 972 |
| pH (pH units) | Bi-Annually | 8.8 | 9.1 |

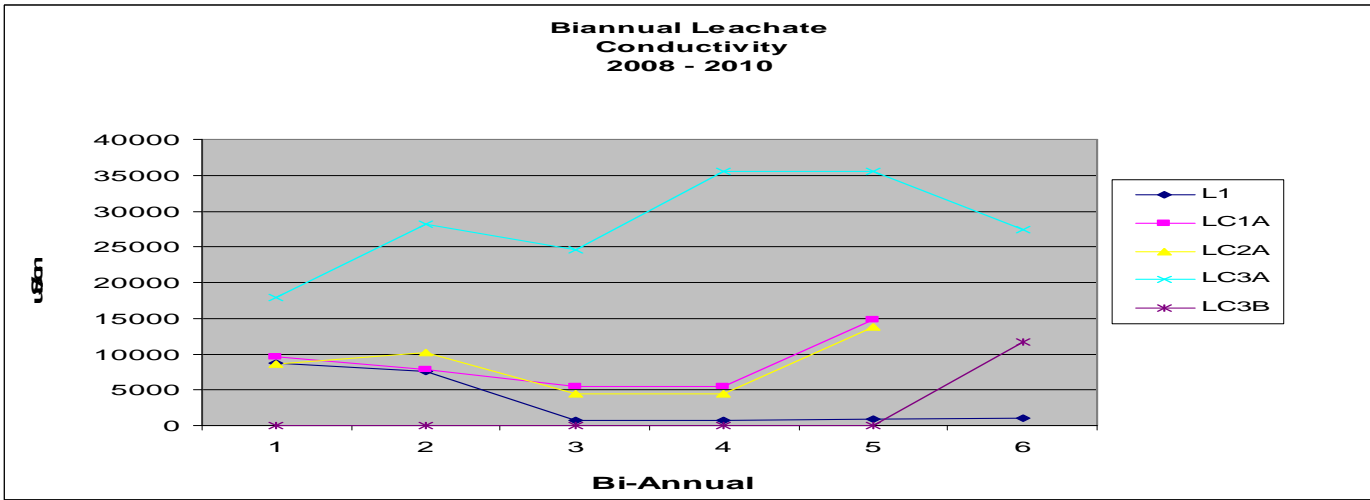
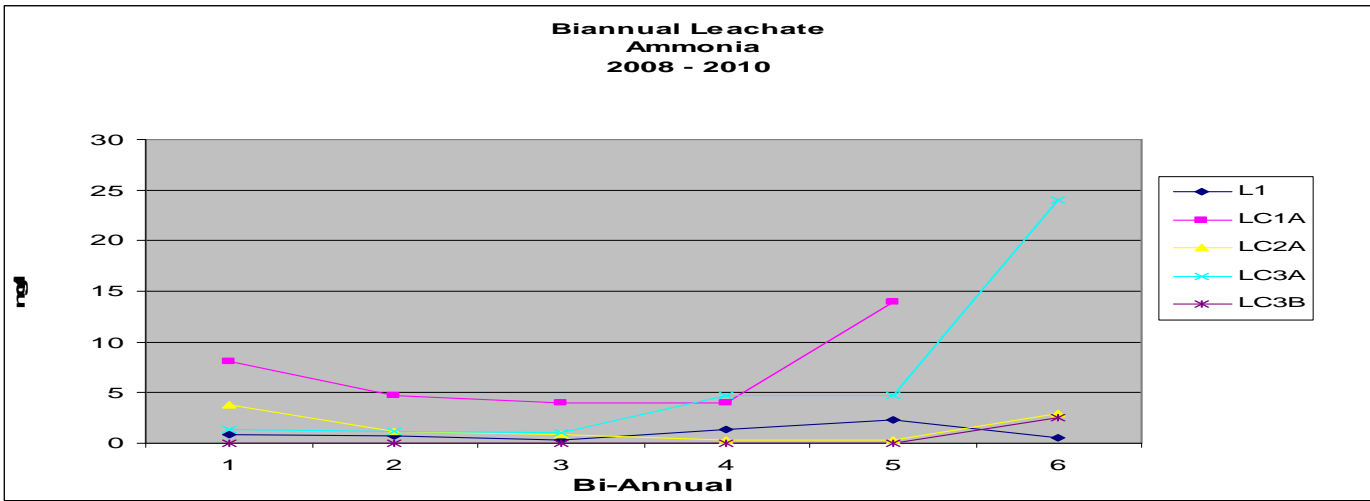
| Monitoring Location: LC1A | | | |
|---------------------------------------|--------------------|------------|------------|
| Parameter | Date | 07/01/2010 | 26/07/2010 |
| COD (mg/l) | Bi-Annually | 150 | 350 |
| Amonical nitrogen (mg/l NH4-N) | Bi-Annually | 3.94 | 14 |
| Temperature (0C) | Bi-Annually | 11.5 | 11.7 |
| Electrical Conductivity (μ S/cm) | Bi-Annually | 5440 | 14840 |
| pH (pH units) | Bi-Annually | 12.57 | 12.81 |

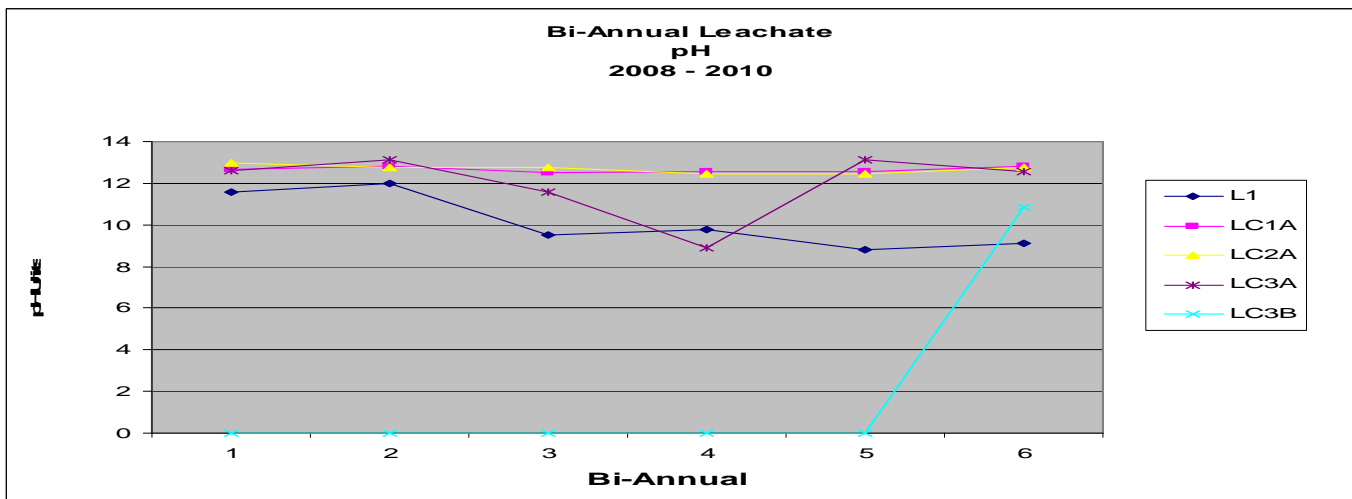
| Monitoring Location: LC2A | | | |
|---------------------------------------|--------------------|------------|------------|
| Parameter | Date | 07/01/2010 | 26/07/2010 |
| COD (mg/l) | Bi-Annually | 68 | 57 |
| Amonical nitrogen (mg/l NH4) | Bi-Annually | 0.34 | 2.92 |
| Temperature (0C) | Bi-Annually | 10.9 | 11.3 |
| Electrical Conductivity (μ S/cm) | Bi-Annually | 4400 | 13710 |
| pH (pH units) | Bi-Annually | 12.45 | 12.77 |

| Monitoring Location: LC3A | | | |
|---------------------------------------|-------------|------------|------------|
| Parameter | Date | 07/01/2010 | 26/07/2010 |
| COD (mg/l) | Bi-Annually | 637 | 496 |
| Amonical nitrogen (mg/l NH4) | Bi-Annually | 4.73 | 24 |
| Temperature (0C) | Bi-Annually | 9.7 | 11.9 |
| Electrical Conductivity (μ S/cm) | Bi-Annually | 35600 | 27410 |
| pH (pH units) | Bi-Annually | 13.1 | 12.55 |

| Monitoring Location: LC3B | | | |
|---------------------------------------|-------------|------------|------------|
| Parameter | Date | 07/01/2010 | 26/07/2010 |
| COD (mg/l) | Bi-Annually | No Sample | 217 |
| Amonical nitrogen (mg/l NH4) | Bi-Annually | | 2.54 |
| Temperature (0C) | Bi-Annually | | 11.5 |
| Electrical Conductivity (μ S/cm) | Bi-Annually | | 11670 |
| pH (pH units) | Bi-Annually | | 10.87 |



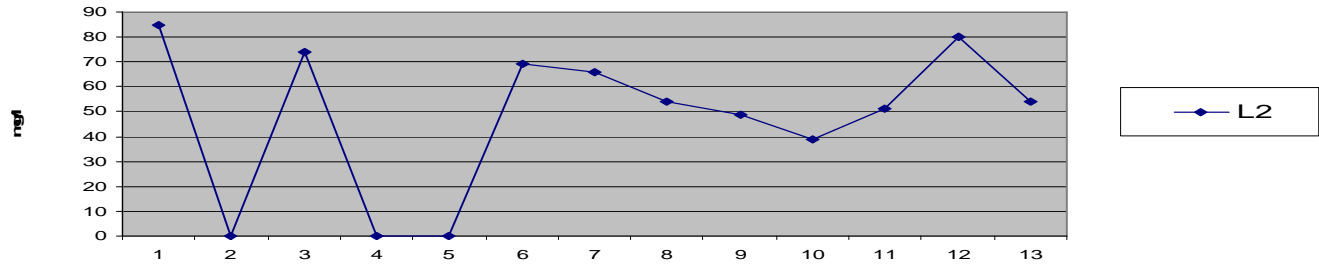




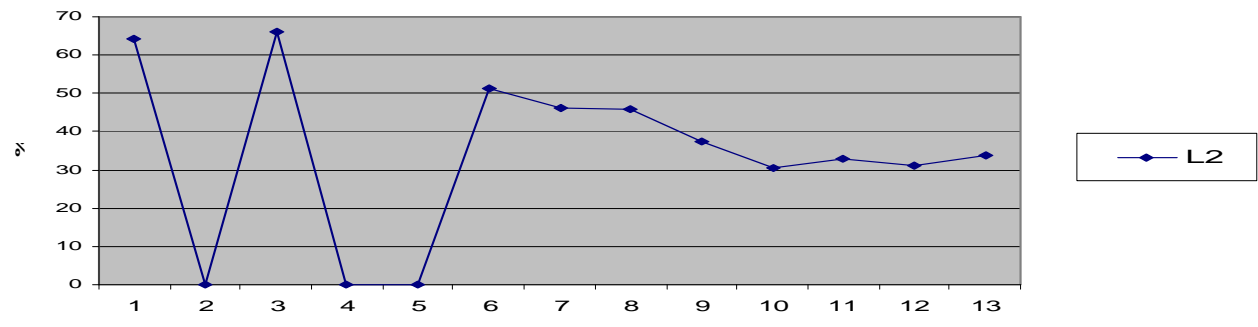
Leachate Discharges L2.

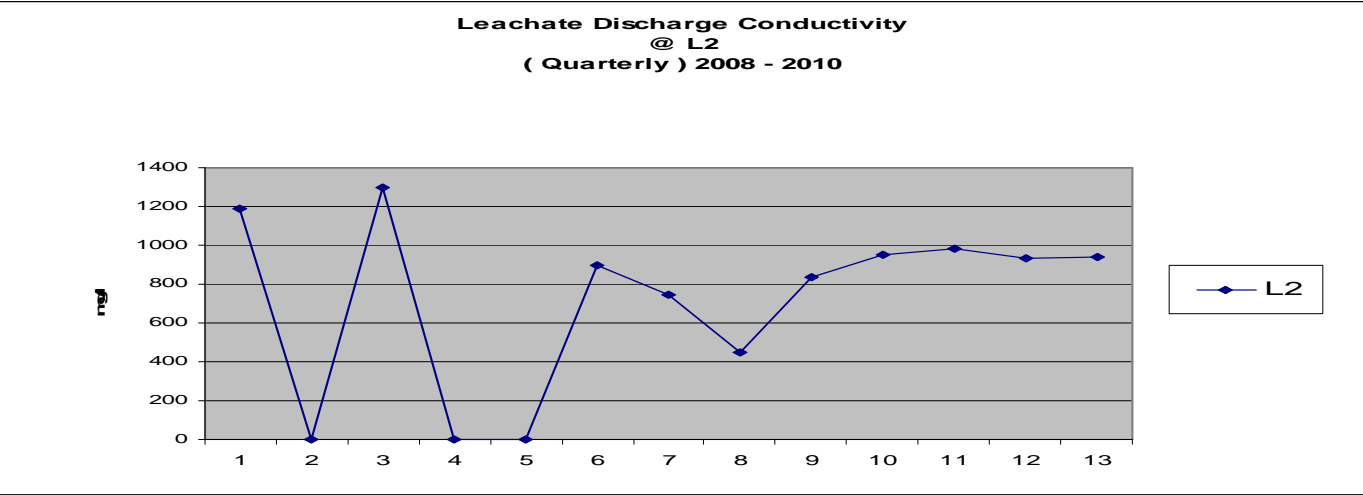
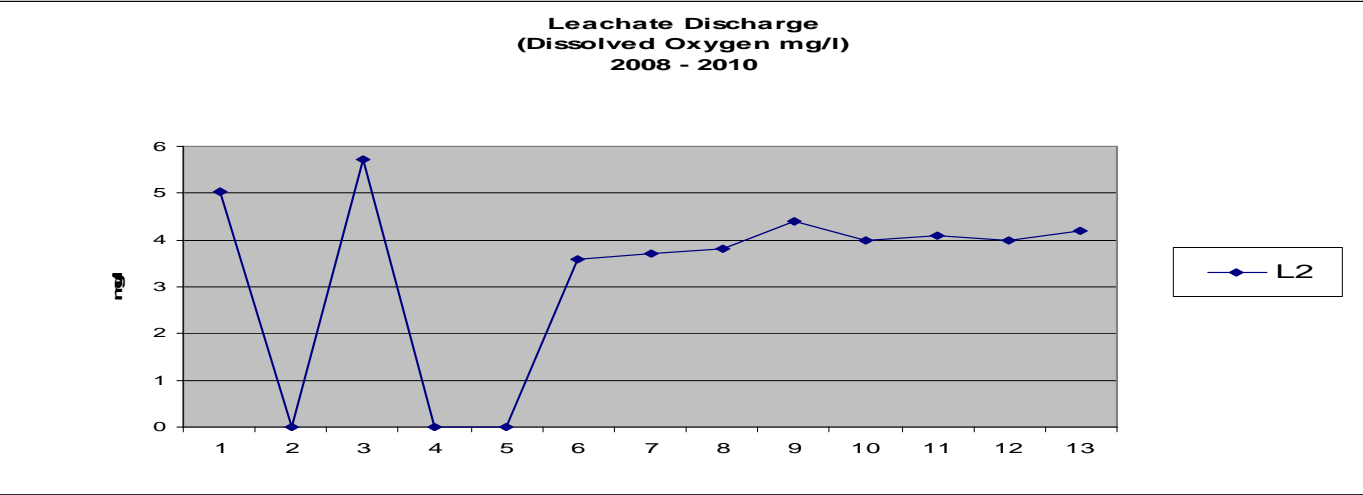
| Monitoring Location: L2 | | | | | | |
|---------------------------------|------------------|------------|------------|------------|------------|------------|
| Parameter | Date | 16/02/2010 | 21/05/2010 | 26/07/2010 | 30/08/2010 | 29/11/2010 |
| COD (mg/l) | Quarterly | 49 | 39 | 51 | 80 | 54 |
| Dissolved oxygen (%) | Quarterly | 37.5 | 30.6 | 32.8 | 31.2 | 33.8 |
| Dissolved oxygen (mg/l) | Quarterly | 4.4 | 3.98 | 4.1 | 3.99 | 4.2 |
| Electrical Conductivity (µS/cm) | Quarterly | 837 | 951 | 981 | 934 | 940 |
| Ammoniacal Nitrogen | Quarterly | 0.97 | 0.86 | 0.76 | 0.02 | 0.65 |
| pH (pH units) | Quarterly | 8.4 | 8.5 | 9.1 | 9.4 | 8.5 |
| Total Suspended Solids (mg/l) | Quarterly | 9 | 9 | 10 | 15 | 13 |

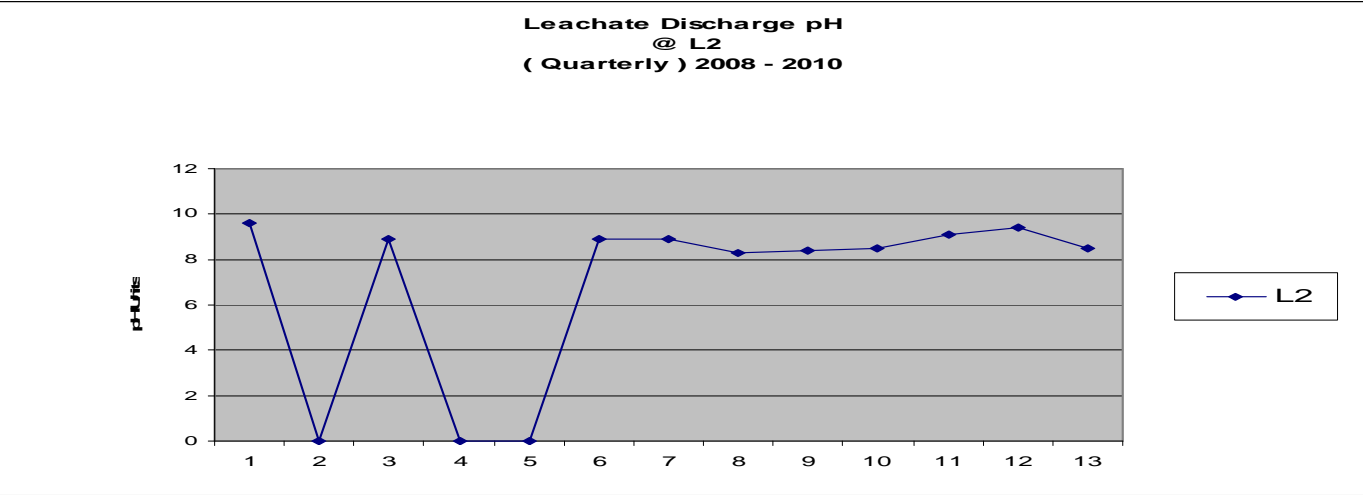
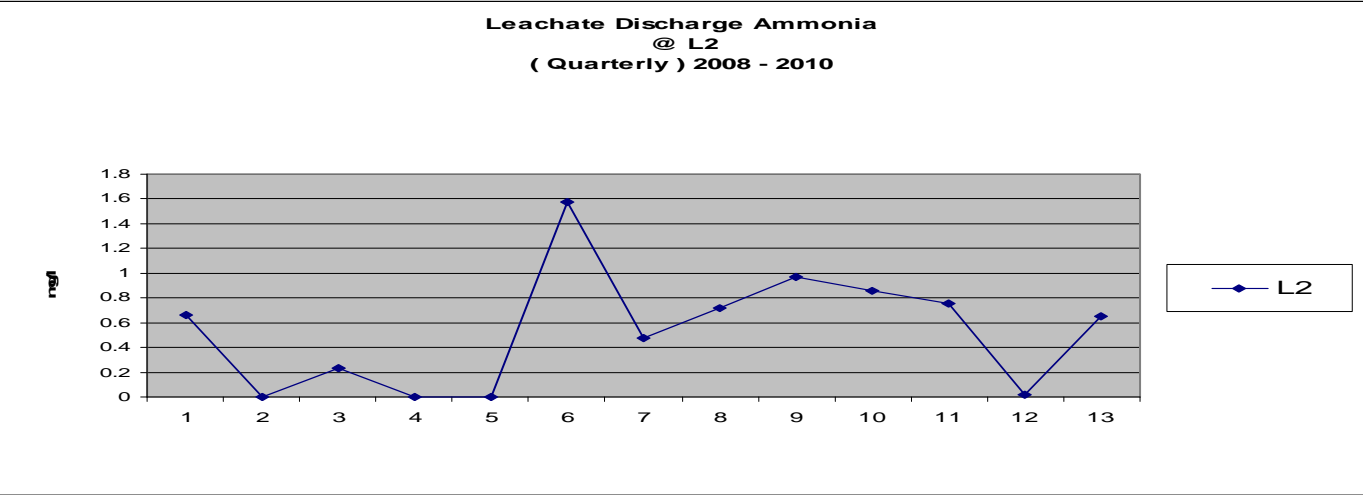
**Leachate Discharge COD
@ L2
(Quarterly) 2008 - 2010**



**Leachate Discharge
(Dissolved Oxygen %)
2008 - 2010**

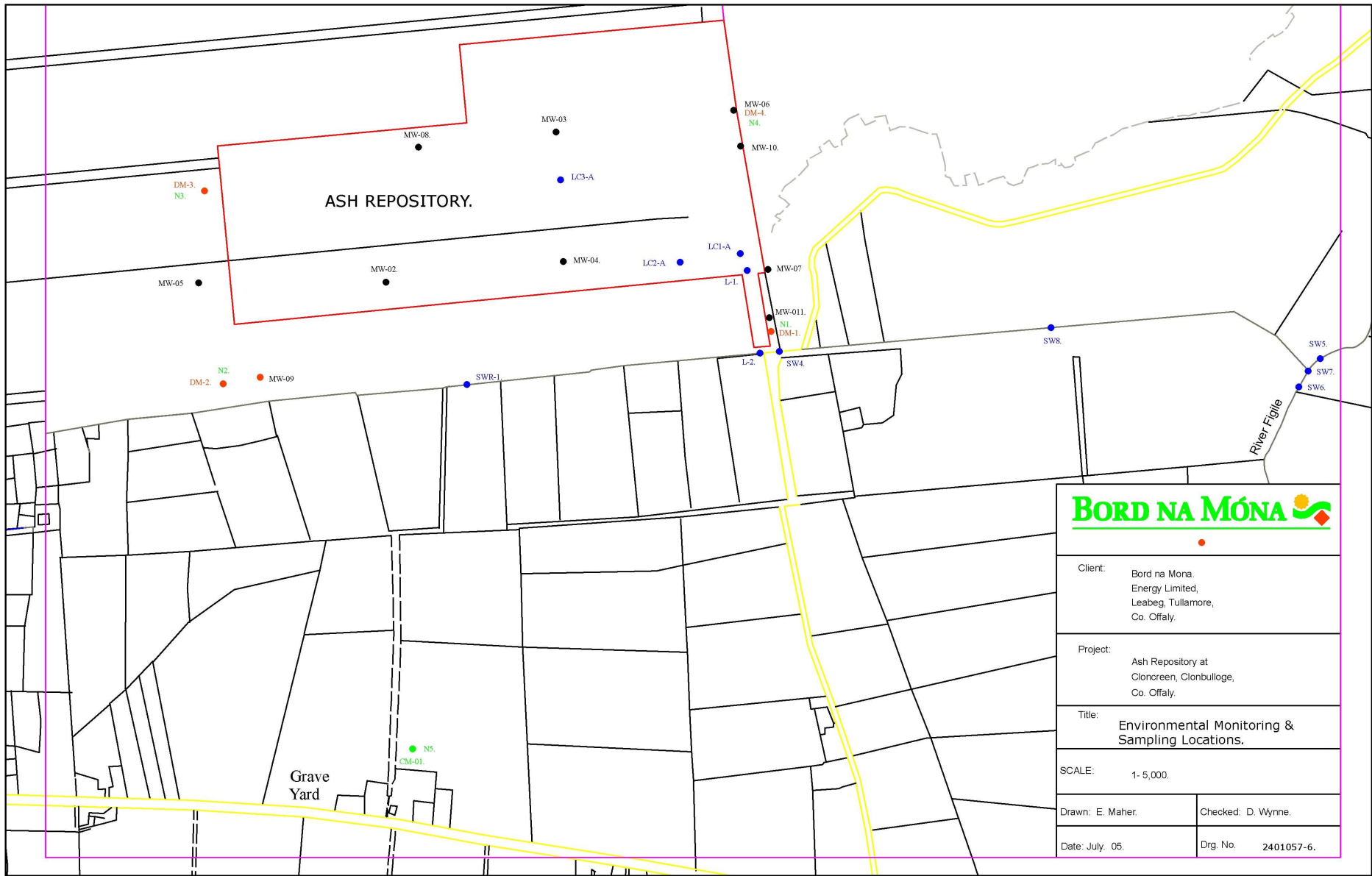






Appendix 3

Monitoring Locations



Client: Bord na Mona Energy Limited, Leabeg, Tullamore, Co. Offaly.

Project: Ash Repository at Cloncreen, Clonbulloge, Co. Offaly.

Title: Environmental Monitoring & Sampling Locations.

SCALE: 1-5,000.

Drawn: E. Maher. Checked: D. Wynne.

Date: July 05. Drg. No. 2401057-6.



[Guidance to completing the PRTR workbook](#)

AER Returns Workbook

Version 1.1.11

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

1. FACILITY IDENTIFICATION

| | |
|----------------------------|----------------------------|
| Parent Company Name | Bord Na Mona |
| Facility Name | Clonbulloge Ash Repository |
| PRTR Identification Number | W0049 |
| Licence Number | W0049-02 |

Waste or IPPC Classes of Activity

| No. | class_name |
|-----|---|
| 3.1 | The initial melting or production of iron and steel |

| | |
|--|---|
| Address 1 | Cloncreen Bog |
| Address 2 | Clonbulloge |
| Address 3 | Co. Offaly |
| Address 4 | |
| Country | Ireland |
| Coordinates of Location | -7.11013 53.274 |
| River Basin District | IESE |
| NACE Code | 3821 |
| Main Economic Activity | Treatment and disposal of non-hazardous waste |
| AER Returns Contact Name | Enda McDonagh (W0049) |
| AER Returns Contact Email Address | enda.mcdonagh@bnm.ie |
| AER Returns Contact Position | Head of Environmental Engineering |
| AER Returns Contact Telephone Number | 057 9345911 |
| AER Returns Contact Mobile Phone Number | 086 2370816 |
| AER Returns Contact Fax Number | 057 9345160 |
| Production Volume | 0.0 |
| Production Volume Units | |
| Number of Installations | 1 |
| Number of Operating Hours in Year | 3796 |
| Number of Employees | 4 |
| User Feedback/Comments | |
| Web Address | www.bnm.ie |

2. PRTR CLASS ACTIVITIES

| Activity Number | Activity Name |
|-----------------|---------------|
| 50.1 | General |

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

| | |
|---|----|
| Is it applicable? | No |
| 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 ? | |

4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR# : W0049 | Facility Name : Clonbulloge Ash Repository | Filename : W0049_2010(1).xls | Return Year : 2010 |

16/09/2011 16:55

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

| POLLUTANT | | METHOD | | | Please enter all quantities in this section in KGs | | | |
|--------------|------|--------|-------------|----------------------------|--|-------------------|------------------------|----------------------|
| No. Annex II | Name | M/C/E | Method Code | Designation or Description | Emission Point 1 | 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 B : REMAINING PRTR POLLUTANTS

| POLLUTANT | | METHOD | | | Please enter all quantities in this section in KGs | | | |
|--------------|------|--------|-------------|----------------------------|--|-------------------|------------------------|----------------------|
| No. Annex II | Name | M/C/E | Method Code | Designation or Description | Emission Point 1 | 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 | | METHOD | | | Please enter all quantities in this section in KGs | | | | QUANTITY | | |
|---------------|------|--------|-------------|----------------------------|--|------|------|------|-------------------|------------------------|----------------------|
| Pollutant No. | Name | M/C/E | Method Code | Designation or Description | DM01 | DM02 | DM03 | DM04 | T (Total) KG/Year | A (Accidental) KG/Year | F (Fugitive) KG/Year |
| 210 | Dust | C | OTH | VDI 2199 Blatt 2/Part 2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3763 | 0.0 | 0.3763 |

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

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH₄) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

| Landfill: Please enter summary data on the quantities of methane flared and / or utilised | Clonbulloge Ash Repository | | | |
|--|----------------------------|-------|-------------|-------------------------------------|
| | T (Total) kg/Year | M/C/E | Method Code | Designation or Description |
| Total estimated methane generation (as per site model) | 0.0 | | | Facility Total Capacity m3 per hour |
| Methane flared | 0.0 | | | 0.0 (Total Flaring Capacity) |
| Methane utilised in engines | 0.0 | | | 0.0 (Total Utilising Capacity) |
| Net methane emission (as reported in Section A above) | 0.0 | | | N/A |

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0049 | Facility Name : Clonbulloge Ash Repository | Filename : W0049_2010(1).xls | Return Year : 2010 |

16/09/2011 16:55

Please enter all quantities on this sheet in Tonnes

3

| Transfer Destination | European Waste Code | Hazardous | Quantity (Tonnes per Year) | Description of Waste | Waste Treatment Operation | Method Used | | Location of Treatment | Haz Waste : Name and Licence/Permit No of Next Destination Facility | Non | Haz Waste : Address of Next Destination Facility | Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY) | Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY) |
|----------------------|---------------------|-----------|----------------------------|-----------------------|---------------------------|--|---|-----------------------|---|---|--|--|--|
| | | | | | | Haz Waste : Name and Licence/Permit No of Recover/Disposer | Non Haz Waste : Address of Recover/Disposer | | Haz Waste : Name and Licence/Permit No of Recover/Disposer | Non Haz Waste : Address of Recover/Disposer | | | |
| Within the Country | 20 03 01 | No | 3.5 | mixed municipal waste | D1 | M | Weighed | Offsite in Ireland | AES,053/OY/39/02 | | Cappincur,Tullamore,Co Offaly,,Ireland | | |

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

[Link to previous years waste data](#)

[Link to previous years waste summary data & percentage change](#)