Kabeyun Limited
(W0121-01)

Gibralter
Castleshane
Co. Monaghan

Annual Environmental Report

2008

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1.0 Reporting Period

For the Year 2008.

2.0 Waste Activities

Kabeyun Ltd is licensed by the Environmental Protection Agency in accordance with the Fourth Schedule of the Waste Management Act 1996 to 2003 for

Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes):

Kabeyun Ltd produces mushroom substrate (compost) at its facility.

3.0 Decommissioning and Aftercare

Section *2.5* of Kabeyun Ltd's Environmental Liabilities Risk Assessment, conducted by WYG Environmental in September 2007 outlines the *Provisions for Site Closure,* and is included below:

2.5 Provisions for Site Closure

Operations at the facility are ongoing with an open-ended lifespan. In the event of a decision to close the facility a closure plan will be developed. This plan will allow for removal of all raw materials, intermediate materials and compost from the site and cleaning of all surfaces where materials/compost were handled and/or stored. A monitoring programme will be carried out on environmental media including air and water to ensure that all emissions from the facility have ceased.

It is assumed that upon closure of the site, the premises will be suitable for industrial or other use and will have a re-sale value, which will cover the costs of removal of materials/compost, site cleaning and monitoring.

When operations cease at the site it is expected that the bulk of the site infrastructure will be sold on to a prospective buyer as an asset. This will include the site buildings, offices, compost tunnels, fencing, gates, lighting, fire alarms and drainage/sewage infrastructure. The potential buyer may also require other plant equipment. However, if not, these will be sold off to other potential buyers separately or dismantled and disposed off site at a licensed facility. Other plant equipment includes generator, site machinery, oil storage tanks and bunds.

When Operations cease at the site any residual compost/waste will be removed and disposed at relevant licensed recovery/disposal facilities. The entire site floors and walls will be power swept and washed to clear all debris and dust. Silt traps will be dislodged and interceptors cleaned out. The waste from the cleaning operations will be disposed to relevant licensed facilities. It is not anticipated that any specialist recovery or disposal will be required.

A monitoring programme of all potential emissions including surface water, foul waters and dust will be carried out after this process in order to ensure that emissions from the site have ceased. The monitoring programme will be designed to include at least two rounds of sampling carried out within two months of the decommissioning of the facility and within at least two weeks apart.

As stated above, operations at the facility are ongoing with an open-ended lifespan. To date, an aftercare management plan has not been developed. Potential nuisances at the site are limited to operational emissions such as odour, dust and noise. After closure and cleaning of the site as described above and when operations have ceased and assuming confirmation from the monitoring programme that all emissions have ceased, it is expected that there will be no requirement for long term aftercare management at the site.

For more details please refer to the ELRA submitted to the EPA on 1st October 2007.

4.0 Capacity of the Facility

In 2008 Kabeyun Ltd produced:

59, 975 Tonnes - Mushroom Substrate (Phase II)

5.0 Waste

5.1 Waste Received:

Table 5.1.1 Type and quantity of Waste received in Kabeyun Limited 2008

Waste Type	EWC Code	Quantity (Tonnes)
Chicken Manure	02 01 06	14,746.25
Gypsum	17 08 02	2,289.56

5.2 Waste Recovered:

See **Table 5.1.1** above.

5.3 Waste Disposed:

See 'Onsite treatment & offsite transfers of waste' in Appendix A.

6.0 Water Usage

Water is provided for Kabeyun Ltd by two groundwater wells on site. A total of 66, 758 m^3 of water was used in 2008 - an average of 5,563 m^3 of water per month, or 1284 m^3 per week. Water usage was slightly lower in 2008, compared to 2007.

7.0 Emissions

7.1 Water monitoring:

Kabeyun Ltd is required to monitor two types of water i.e. surface water and groundwater. Surface water sampling locations include SW1. Two groundwater monitoring locations exist; GW1 and GW2.

Monitoring was carried out: - on ground waters in January, June, September and November 2008. In December 2008 by the EPA.
- on SW1 in February 2008. On river water in December 2008 by the EPA.

7.2 Airborne Micro-Organism Monitoring:

Four Airborne Micro-Organism monitoring locations exist on the Kabeyun site; AB1, AB2, AB3 and AB4. During sampling all four locations were monitored: AB1, located upwind of the facility, with AB2, AB3 and AB4 situated downwind of the facility.

Monitoring was carried out: - July 2008.

7.3 Dust Monitoring:

Four dust monitoring locations exist on the Kabeyun site, D1, D2, D3 and D4. Time period required to complete dust monitoring is 30 (+/- 2) days.

Monitoring was carried out: - April/May 2008.
- August/September 2008.
- October/November 2008.

7.4 Noise Monitoring:

Monitoring was carried out: - April 2008.
- October 2008.

7.5 Biological Survey of the Cor River:

Survey was carried out: - September 2008.

8.0 Results and Interpretation

8.1 Water

Table 8.1.1 Groundwater Monitoring Results for Kabeyun Limited 2008 – GW1

	GW1 (Top Well)				
	30.01.08	**09.06.08**	**05.09.08**	**28.11.08**	**19.12.08**
pH	7.46	7.2	7.56	7.4	7.3
COD (mg/l O2)	14	<4	4.5	5.6	<10
Ammonia (mg/l) NH4-N	0.188	0.386	0.387	0.254	0.39
Nitrates (mg/l) NO3-N	<0.5	1.26	0.57	1.35	-
Sulphate	32	24	18	17	19.5
Total Coliforms (per 100ml)	Absent	Absent	Absent	Absent	-
E.Coli (per 100ml)	Absent	Absent	Absent	Absent	-

Table 8.1.2 Groundwater Monitoring Results for Kabeyun Limited 2008 – GW2

	GW2 (Bottom Well)				
	30.01.08	**09.06.08**	**05.09.08**	**28.11.08**	**19.12.08**
pH	7.17	7.14	7.34	7.23	7.2
COD (mg/l O2)	10	<4	4.1	7.5	<10
Ammonia (mg/l) NH4-N	0.276	0.227	0.367	0.168	0.4
Nitrates (mg/l) NO3-N	<0.5	1.10	0.79	0.96	-
Sulphate	51	19	20	18	19.9
Total Coliforms (per 100ml)	Absent	Absent	Absent	Absent	-
E.Coli (per 100ml)	Absent	Absent	Absent	Absent	-

Groundwater monitoring was conducted on five occasions at Kabeyun Ltd during 2008 – in January, June, September and November by Bio-labs, Monaghan and in December by the EPA, Monaghan. Results are displayed in **Tables 8.1.1 and 8.1.2** above. All samples were found to have satisfactory results; not exceeding specified limits.

Table 8.1.3 Surface water Monitoring Results for Kabeyun Ltd 2008 – SW1 and Cor River

	SW1	Upstream	Downstream
	12.02.08	**19.12.08**	**19.12.08**
Temperature	-	5.2	5.2
(% saturation)	-	96	96
COD (mg/l O2)	7	16	25
pH	6.76	7.6	7.8
Ammonia (mg/l N)	0.013	0.09	0.08
TON (mg/l N)	-	0.94	1.04
Sulphate (mg/l SO4)	20	9.6	12.7
Total P (mg/l P)	0.36	0.044	0.039
BOD (mg/l O2)	1.4	<1.5	<1.5
Conductivity	425	302	310
Suspended Solids (mg/l)	6.2	<5	<5

SW1; the surface water pipe entering the Cor River, upstream of the Kabeyun facility was sampled in February 2009. All results fell within specified limits. The EPA, Monaghan then carried out surface water monitoring on the Cor River in December 2008; all results displayed in **Table 8.1.3** above. The Cor River runs along the eastern perimeter of the Kabeyun facility, in a NE direction. The EPA found no results to be exceeding specified limits. Water quality downstream is consistent with water quality upstream indicating no adverse impact from the Kabeyun facility.

8.2 Airborne Micro-Organisms

Table 8.2.1 Airborne Micro-Organism Results for Kabeyun Ltd 2008

Monitoring Location	Mesophillic Bacteria cfu/m^3		Aspergillus fumigatus cfu/m^3	
	Sample 1	Sample 2	Sample 1	Sample 2
AB1 u/w	410	28	0	0
AB2 d/w of bale breaking line	7,138	2,320	0	0
AB3 d/w at site entrance	459	1,088	0	14
AB4 d/w at nearest receptor	28	14	0	0
Control Sample	0	-	0	-
Typical Reported Concentrations at Compost Facilities	10,000 - 10,000,000		0 - 10,000	

As per Schedule ***E.3 Airborne Microbes*** of our Waste Licence, Airborne Micro-Organism monitoring was conducted on 29 July 2008 by QED Engineering Ltd. Results of which are displayed in **Table 8.2.1** above.

A South Easterly wind was evident on the day and four sampling locations were chosen accordingly, one upwind of the facility (AB1), and three downwind of the facility (AB2, AB3 and AB4). AB1 and AB3 were at a distance of 25m from the site. AB2 was located on site, slightly downwind of the bale breaking line. AB4 was located 400m from the site, at the nearest sensitive receptor (house). At each sample location two samples for Mesophillic Bacteria analysis and two samples for Aspergillus fumigatus analysis were taken. At location AB3, a control sample was also taken.

A small concentration of Mesophillic Bacteria was recorded at AB1, upwind of the facility; Sample 1 - 410 cfu/m^3 and Sample 2 – 28 cfu/m^3. These results act as an indicator of the background levels of bio-aerosols present naturally in the environment. A higher concentration of Mesophillic Bacteria was recorded at AB2, with results of 7,138 cfu/m^3 and 2,320 cfu/m^3. This sampling location was slightly downwind of the bale breaking line in the Phase I working area. Both Mesophillic Bacteria (459 cfu/m^3 and 1,088 cfu/m^3) and a small concentration of Aspergillus fumigatus (14 cfu/m^3) were recorded at AB3. But levels here were much lower than at AB2, which indicates a natural drop-off with distance from the working area. At AB4, 400m from the site, a small concentration of Mesophillic Bacteria was recorded in both samples; 28 cfu/m^3 and 14 cfu/m^3. As can be seen from Table **Table 8.2.1**, all concentrations

present at Kabeyun Ltd are lower than typical levels recorded at compost facilities. Therefore it can be assumed that Kabeyun Ltd is not adversely impacting on the environment in relation to airborne micro-organisms. For more details please refer to the monitoring report submitted to the EPA on 25 August 2008.

8.3 *Dust*

Table 8.3.1 Dust Monitoring Results Kabeyun Ltd – April/May 2008

Monitoring Location	Survey period 03/04/08 - 02/05/08	Dust Deposition ($mg/m^2/day$)
D1	29 Days	182.2
D2		10.7
D3		Jar Broken
D4		819.9(1)

Note 1: A large amount of organic matter was present in D4. This organic matter is deemed to have contaminated the sample and therefore, an accurate determination of the dust deposition levels at D4 was not possible.

Table 8.3.2 Dust Monitoring Results Kabeyun Ltd – August/September 2008

Monitoring Location	Survey period 05/08/08 - 02/09/08	Dust Deposition ($mg/m^2/day$)
D1	28 Days	671.8(1)
D2		28.7
D3		5.7
D4		803.9(1)

Note 1: Organic matter was noted in D1 and D4.

Table 8.3.3 Dust Monitoring Results Kabeyun Ltd – October/November 2008

Monitoring Location	Survey period 16/10/08 - 13/11/08	Dust Deposition ($mg/m^2/day$)
D1	28 Days	166.5(1)
D2		126.3(1)
D3		780.9
D4		252.6

Note 1: Leaves were noted in D1 and D2.

Tables 8.3.1, 8.3.2 and 8.3.3 above display dust deposition results from monitoring conducted at Kabeyun Ltd in April/May 2008, August/September 2008 and October/November 2008 by White Young & Green Environmental Ltd. During the course of monitoring several jars became contaminated with leaves and other organic matter, therefore determination of the dust deposition at these locations on these occasions was not possible. All remaining results however fell within licence limits of 350 $mg/m^2/day$, with the exception of D3 during the third round of monitoring, which had a dust deposition level of 780.9 $mg/m^2/day$ (**Table 8.3.3**). There doesn't appear to be any obvious reason for this level of dust deposition on this occasion. For more details please refer to the monitoring reports submitted to the EPA on 06 June 2008 and 11 December 2008. It is planned to assess the situation further by completing the required monitoring in 2009.

8.4 Noise

Table 8.4.1 Day Time Noise Monitoring Results for Kabeyun Ltd; 3rd April 2008

Noise Monitoring Location	Survey Start Time	$L(A)_{eq}$ dB	$L(A)_{10}$ dB	$L(A)_{90}$ dB	Main Noise Sources
NSL1 Day	12.30 - 13.00	50.9	50.1	40.8	Intermittent traffic, reversing beacons on loaders, tractor.
NSL2 Day	10.55 - 11.25	44.0	46.0	31.8	Distant intermittent traffic, loaders on site, generally quiet.

Table 8.4.2 Night Time Noise Monitoring Results for Kabeyun Ltd; 3rd April 2008

Noise Monitoring Location	Survey Start Time	$L(A)_{eq}$ dB	$L(A)_{10}$ dB	$L(A)_{90}$ dB	Main Noise Sources
NSL1 Night	23.03 - 23.18	44.9	46.5	41.7	Intermittent traffic, fans.
NSL2 Night	22.46 - 23.01	45.8	47.2	43.2	Distant intermittent traffic, generally very quiet.

Table 8.4.3 Day Time Noise Monitoring Results for Kabeyun Ltd; 8th October 2008

Noise Monitoring Location	Survey Start Time	$L(A)_{eq}$ dB	$L(A)_{10}$ dB	$L(A)_{90}$ dB	Main Noise Sources
NSL1 Day	16.07 - 16.37	45.5	48.6	39.8	Intermittent traffic from main road and adjacent road, reversing beacons on loaders, tractor.
NSL2 Day	15.25 - 15.55	41.2	44.3	35.0	Distant intermittent traffic, bird song, generally quiet.

Table 8.4.4 Night Time Noise Monitoring Results for Kabeyun Ltd; 8th October 2008

Noise Monitoring Location	Survey Start Time	$L(A)_{eq}$ dB	$L(A)_{10}$ dB	$L(A)_{90}$ dB	Main Noise Sources
NSL1 Night	22.45 - 23.15	36.0	38.5	32.4	Intermittent traffic in the distance, horses or cattle in adjacent field.
NSL2 Night	23.28 - 23.58	44.7	48.8	28.2	Distant intermittent traffic from main road, generally very quiet.

Noise monitoring was carried out in April 2008; **Tables 8.4.1** and **8.4.2** and in October 2008; **Tables 8.4.3 and 8.4.4**, by White Young & Green Environmental Ltd. The daytime $L(A)_{eq}$ levels at both NSL1 and NSL2 on both occasions, were below the daytime limit of 55dB, with noise levels of 50.9dB, 44.0dB, 45.5dB and 41.2dB. Night-time levels at NSL1 and NSL2 on both occasions were also within the limits set (45dB) with $L(A)_{eq}$ levels of 44.9dB, 45.8dB, 36.0dB and 44.7dB, with main noise sources being intermittent traffic. For more details please refer to the monitoring reports submitted to the EPA on 06 May 2008 and 23 December 2008.

8.5 Biological Survey of the Cor River

Table 8.5.1 Summary of Biological Monitoring Results 2000 – 2008

		2000	2006	2008
Upstream of Kabeyun Site	**Site 1**	Q3-4	Q3	Q3
	Site 2	Q3-4	Q2-3	Q3
Downstream of Kabeyun Site	**Site 3**	Q3-4	Q3	Q3

Biological monitoring of water quality in the vicinity of the Kabeyun Ltd facility was conducted by Conservation Services, Ecological and Environmental Consultants on 18 September 2008. A summary of results are displayed in **Table 8.5.1** above. All sites monitored in 2008 had a Q-Rating of Q3. The assessment concluded that there is no evidence of a pollution impact from the Kabeyun facility on the Cor River. For more details please refer to the monitoring report submitted to the EPA on 28 October 2008.

9.0 Resource and Energy Consumption

Electricity consumption in 2008 was 2,631,948 kw units. This shows a decrease of 152,399 kw units in 2008 from the 2007 figure of 2,784,347 kw units (5.5% decrease).

10.0 Proposed Development of Kabeyun Ltd

A new facility has been designed for Kabeyun Ltd. A planning application was submitted to Monaghan County Council in July 2008. Planning permission was granted in October 2008.

The new development consists of:

- A new building to facilitate the indoor storage of chicken litter and gypsum
- New enclosed bunkers for the production of phase I mushroom substrate
- A new building to facilitate the production of phase 2 and phase 3 mushroom substrate
- A telemetry system for the continuous monitoring required under Condition 3.16.1

11.0 Development works completed during 2008

See **Section 16.0** Costs. Planning permission for the new development was obtained. The new screen for the goodie water storage tank was commissioned.

12.0 Environmental Objectives and Targets for 2008

Several targets for 2008 were completed during the year, whilst progress was made on others.

- The required monitoring of water, dust, noise, odour, airborne micro-organisms and biological assessment of the Cor River were completed.
- Work is still underway for the installation of the new screen and aeration system in the goodie water storage tank.
- Planning permission has been received from Monaghan County Council for the re-development of the facility.

13.0 Environmental Objectives and Targets for 2009

Our environmental objectives were formulated as part of our EMS. These objectives include:

- Prevent pollution of land and waterways
- Use natural resources efficiently
- Reduce odour from the site
- Reduce waste and handle waste responsibly
- Improve management of chemicals and oils on-site

Targets have been set. Environmental Management Programmes are in place to help meet our targets and achieve our objectives.

The new development, outlined in **Section 10.0** will provide for improvement in all areas outlined in our objectives.

Other targets, specifically relating to our waste licence, that we plan to achieve in 2009 include:

- Complete the required monitoring of water, dust, noise, odour and airborne micro-organisms.
- Complete the installation of the aeration system in the goodie water storage tank.
- Commence work on the re-development of the facility.

14.0 Complaints

13 complaints were received in 2008, all regarding odour emissions from the facility.

Table 14.1 Complaint details for Kabeyun Limited 2008

Complainant	No. of complaints received
Kieran & Marita Sherry	7
Brendan Hamilton	3
Brendan & Jean Mc Cleary	2
Dessie Lynch	1

15.0 Nuisance Controls

A pest control system is in place in Kabeyun Ltd, run by Ecolab. Ecolab conduct regular checks on the vermin controls on the site, and a maintenance record is updated accordingly.

All Vehicles entering and leaving the site are inspected to ensure that they are appropriately covered.

Other nuisances are assessed and recorded daily.

16.0 Costs

Costs for environmental reports and monitoring completed in 2008 was c. €35,000 +VAT.
Costs for planning permission was c. 94,000 + VAT.
Costs for new screen in the goodie water tank was c. 92,000 +VAT.

17.0 Staff Training

Staff training is on-going. Training is conducted to maintain awareness with employees of our environmental objectives and targets and how they can be achieved. Posters and procedures have been erected in target areas for consultation if required.

The company environmental manager also completed the FAS Waste Management Training course in May 2008.