Attachment J: Environmental Monitoring

Emissions or potential emissions from the facility are shown in the drawing 'emission points' included in Attachment H.

The emission points are as follows:

Emission point	Grid reference	Description
EP:A1-1	251995E 245869N	Biofilters for Composting Tunnels
EP:A1-2	252027E 245808N	Biofilter for mixed waste ASPs
EP:A1-3	252003E 245772N	Biofilter for green waste ASPs
EP:A1-4	251897E 245805N	Biofilter for waste reception area
EP:A1-5	252016E 245721N	Green waste shredder
EP:A1-6	252140E 245703N	Fugitive emissions of dust from general site activities
EP:SW2	252054E 245993N	Surface water run-off
EP:SW4	252336E 245756N	Outlet from water treatment plant
EP:GW1	252322E 245703N	Percolation area from domestic waste water treatment system
EP:N1	252140E 245703N	General noise emissions from vehicles and plant

These emission points were considered when designing the proposed monitoring for the site.

Suggested monitoring points are identified in the following table and are shown in the attached drawings 'monitoring points (a)' and 'monitoring points (b)'

Monitoring point	Grid reference	Description
A1-1	251995E 245869N	Biofilters for Composting Tunnels
A1-2	252027E 245808N	Biofilter for mixed waste ASPs
A1-3	252003E 245772N	Biofilter for green waste ASPs
A1-4	251897E 245805N	Biofilter for waste reception area
A1-5	252016E 245721N	Green waste shredder
A2-1	252912E 244862N	Air sensitive receptor
A2-2	253251E 245422N	Air sensitive receptor
A2-3	252744E 246113N	Air sensitive receptor
A2-4	251617E 246631N	Air sensitive receptor
A2-5	252231E 245606N	Point on site boundary
SW1	252026E 246022N	Upstream surface water
SW2	252054E 245993N	Outlet from water treatment plant
SW3	251855E 245980N	Upstream surface water
SW4	252383E 245688N	Downstream monitoring point
GW1	252133E 245852N	Groundwater monitoring point
GW2	252065E 245620N	Groundwater monitoring point
GW3	252322E 245687N	Down-gradient groundwater monitoring point
GW4	251837E 245805N	Up-gradient groundwater monitoring point
M1	252143E 245629N	Weather station
N1	252912E 244862N	Noise sensitive receptor
N2	253251E 245422N	Noise sensitive receptor
N3	252744E 246113N	Noise sensitive receptor
N4	251617E 246631N	Noise sensitive receptor
N5	252231E 245606N	Site boundary

J1. Dust, PM10 and bioaerosol

Dust , PM10 and Bioaerosol monitoring will be carried out at the locations and frequency specified in the table below:

Ref	Location	Parameter	Frequency
A2-1	Air sensitive receptor	Dust, PM10, Total Bacteria & Fungi	Quarterly
A2-2	Air sensitive receptor	Dust, PM10, Total Bacteria & Fungi	Quarterly
A2-3	Air sensitive receptor	Dust, PM10, Total Bacteria & Fungi	Quarterly
A2-4	Air sensitive receptor	Dust, PM10, Total Bacteria & Fungi	Quarterly
A2-5	Point on site boundary	Dust, PM10, Total Bacteria & Fungi	Quarterly

Methodology: Dust

Quarterly dust deposition sampling over a one-month period will be conducted using Bergerhoff gauges in accordance with the German Standard VDI 2119, at the specified monitoring locations. This will require the placement of a 1.5m pole with a deposition jar (Bergerhoff Gauges) at each location. These will be exposed to ambient air for approximately 30 days, after which the jars will be sent to a contracted laboratory for analysis of total dust content. The mass of dust deposited per unit area of the jars' internal surface over the monitoring period will be measured.

Methodology: PM_{10}

PM_{10} monitoring will involve the use of a portable particulate air sampling unit (such as the Airmetrics MiniVol or similar) which will be fixed at each monitoring point. The MiniVol is placed at a monitoring point for a period of 24hrs, this equipment sucks in air through a pre-weighed, selective filter which will trap only those dust particles of less than or equal to 10 µm in diameter. The weight of the particulate matter is determined subsequently in the laboratory, and will be reported as $\mu g/m^3$.

Methodology: Bioaerosols

The Environment Agency for England and Wales (Ref. 1) sets out a number of appropriate methodologies for sampling of bioaerosols. The following methodology can be used where monitoring locations are remote from mains power supply.

Samples of bioaerosols in ambient air will be obtained using battery operated SKC pumps. A sample time of approximately 15 minutes per sample will be used, with the pumps set to a flow rate of approximately 2 litres per minute, giving a total sample volume of approximately 30 litres.

Sterilised Micropore filters of pore size 0.4µm, stored in sterile Petri dishes, are used to collect samples of total bacteria and total fungi. In addition one 'field blank' and one 'box blanks' will also be collected. The field blank is a filter which is handled in the same manner as the sample filters but not exposed to ambient air to assess any bacteria or fungi picked up during handling and transport, and the box blank is a filter that is not handled, but is used to assess levels of bacteria and fungi pre-present on the filters before exposure.
After sampling the filters will be placed in the Petri dishes and sent to a laboratory for analysis. The samples are placed upon selective growing media for bacteria or fungi and the total numbers of colony forming units is recorded for each sample.

The results are analysed and the numbers of colony forming units per cubic meter of ambient air are calculated.

J2. Ecological

No ecological monitoring is proposed.

J3. Groundwater

Monitoring will be carried out at the locations and frequency specified in the table below:

Ref	Location	Parameter	Frequency
GW1	Groundwater monitoring point	Groundwater level	Quarterly
		Ammoniacal Nitrogen (as NH_4-N)	Quarterly
		Chloride	Quarterly
		Electrical Conductivity	Monthly
		pH	Monthly
		Coliforms (total, faecal)	Quarterly
GW2	Groundwater monitoring point	Groundwater level	Quarterly
		Ammoniacal Nitrogen (as NH_4-N)	Quarterly
		Chloride	Quarterly
		Electrical Conductivity	Monthly
		pH	Monthly
		Coliforms (total, faecal)	Quarterly
GW3	Down-gradient groundwater monitoring point	Groundwater level	Quarterly
		Ammoniacal Nitrogen (as NH_4-N)	Quarterly
		Chloride	Quarterly
		Electrical Conductivity	Monthly
		pH	Monthly
		Coliforms (total, faecal)	Quarterly
GW4	Up-gradient groundwater monitoring point	Groundwater level	Quarterly
		Ammoniacal Nitrogen (as NH_4-N)	Quarterly
		Chloride	Quarterly
		Electrical Conductivity	Monthly
		pH	Monthly
		Coliforms (total, faecal)	Quarterly

Methodology

Samples will be taken by use of bailers. It shall be ensured that between 2 and 5 bore volumes are purged from the boreholes prior to any samples being taken, samples will not be collected until three concurrent readings of electrical conductivity are recorded. These measures will ensure that representative samples of the overall groundwater quality are assessed. Samples will be collected in pre-labelled samples bottles.

J4. Air

Monitoring will be carried out at the locations and frequency specified in the table below:

Ref	Location	Parameter	Frequency
A1-1	Biofilters for Composting Tunnels	Inlet and outlet gas: ♦ Ammonia, Hydrogen Sulphide and Mercaptans Bed media: ♦ Moisture content, pH, ammonia, Total viable counts ♦ Odour and condition and depth of biofilter	Bi-annually Bi-annually Daily
A1-2	Biofilter for mixed waste ASPs	Inlet and outlet gas: ♦ Ammonia, Hydrogen Sulphide and Mercaptans Bed media: ♦ Moisture content, pH, ammonia, Total viable counts ♦ Odour and condition and depth of biofilter	Bi-annually Bi-annually Daily
A1-3	Biofilter for green waste ASPs	Inlet and outlet gas: ♦ Ammonia, Hydrogen Sulphide and Mercaptans Bed media: ♦ Moisture content, pH, ammonia, Total viable counts ♦ Odour and condition and depth of biofilter	Bi-annually Bi-annually Daily
A1-4	Biofilter for waste reception area	Inlet and outlet gas: ♦ Ammonia, Hydrogen Sulphide and Mercaptans Bed media: ♦ Moisture content, pH, ammonia, Total viable counts ♦ Odour and condition and depth of biofilter	Bi-annually Bi-annually Daily

Methodology

Daily subjective odour assessments will be carried out at each biofilter. The condition and depth of the biofilter will be checked at the same time, to ensure that no channelling is evident and that moisture content is adequate.

Bi-annual monitoring of the bed media and inlet and outlet gases will be carried out using standard laboratory procedures.

J.5 Sewer Discharge

Not applicable

J6. Meteorological Data

A weather station will be located on site to collect the following data:

Ref	Location	Parameter	Frequency
M1	Site office	♦ Precipitation volume ♦ Wind speed & direction	continuously

J7. Noise

Monitoring will be carried out at the locations and frequency specified in the table below:

Ref	Location	Parameter	Frequency
N1	Noise sensitive receptor	♦ $L(A)_{EQ}$ [30mins] ♦ $L(A)_{10}$ [30 mins] ♦ $L(A)_{90}$ [30 mins] ♦ Frequency Analysis (1/3 Octave band analysis)	Bi-annually
N2	Noise sensitive receptor	♦ $L(A)_{EQ}$ [30mins] ♦ $L(A)_{10}$ [30 mins] ♦ $L(A)_{90}$ [30 mins] ♦ Frequency Analysis (1/3 Octave band analysis)	Bi-annually
N3	Noise sensitive receptor	♦ $L(A)_{EQ}$ [30mins] ♦ $L(A)_{10}$ [30 mins] ♦ $L(A)_{90}$ [30 mins] ♦ Frequency Analysis (1/3 Octave band analysis)	Bi-annually
N4	Noise sensitive receptor	♦ $L(A)_{EQ}$ [30mins] ♦ $L(A)_{10}$ [30 mins] ♦ $L(A)_{90}$ [30 mins] ♦ Frequency Analysis (1/3 Octave band analysis)	Bi-annually
N5	Site boundary	♦ $L(A)_{EQ}$ [30mins] ♦ $L(A)_{10}$ [30 mins] ♦ $L(A)_{90}$ [30 mins] ♦ Frequency Analysis (1/3 Octave band analysis)	Bi-annually

Monitoring Method

Noise surveys will involve bi-annual statistical analysis (LAeq and LA90) and frequency analysis during the day-time. A sound level meter will be set up at each noise sensitive receptor for a period of 30 minutes, in accordance with the guidance given in ISO 1996 Acoustics, parts 1-3, (Description and Measurement of Environmental Noise). Results are logged and saved from the sound level meter. Results will be interpreted and reported by a qualified acoustics / noise consultant, with reference to potential sources of noise emissions and levels of on and off site activity during the survey period.

J8. Odours

See J4, Air monitoring.

J9. Surface Water

Monitoring will be carried out at the locations and frequency specified in the table below:

Ref	Location	Parameter	Frequency
SW1	Upstream surface water	♦ Visual inspection ♦ Ammoniacal Nitrogen ♦ $BOD_{(5day)}$ ♦ Electrical Conductivity ♦ pH ♦ Total Suspended solids ♦ Coliforms (total, faecal)	Weekly Quarterly Quarterly Monthly Monthly Quarterly Quarterly
SW2	Outlet from water treatment plant	♦ Visual inspection ♦ Ammoniacal Nitrogen ♦ $BOD_{(5day)}$ ♦ Electrical Conductivity ♦ pH ♦ Total Suspended solids ♦ Coliforms (total, faecal)	Weekly Quarterly Quarterly Monthly Monthly Quarterly Quarterly
SW3	Upstream surface water	♦ Visual inspection ♦ Ammoniacal Nitrogen ♦ $BOD_{(5day)}$ ♦ Electrical Conductivity ♦ pH ♦ Total Suspended solids ♦ Coliforms (total, faecal)	Weekly Quarterly Quarterly Monthly Monthly Quarterly Quarterly
SW4	Surface water run-off from site	♦ Visual inspection ♦ Ammoniacal Nitrogen ♦ $BOD_{(5day)}$ ♦ Electrical Conductivity ♦ pH ♦ Total Suspended solids ♦ Coliforms (total, faecal)	Weekly Quarterly Quarterly Monthly Monthly Quarterly Quarterly

Monitoring Methods

It is recognised that surface water monitoring schedules must take account of the quality of natural surface waters (e.g. the existing or receiving environment) and the quality of discharges to these surface waters (e.g. outflow from storm water attenuation ditches). Existing surface waters will be monitored by grab sampling at the above stated frequency. Discharges from the storm water/treatment plant outlets will be monitored by composite, flow-proportional sampling over a 24-hour monitoring period to ensure that all samples and analytical results are representative of any continuous discharge.

All samples will be sent to an accredited contract laboratory for analysis. Monthly pH and conductivity monitoring of groundwater and surface water will be carried out by the site environmental manager using meters which will be kept on site. The Environmental Manager will be trained in the use of the monitoring equipment.

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File name: MIB1493.dwg

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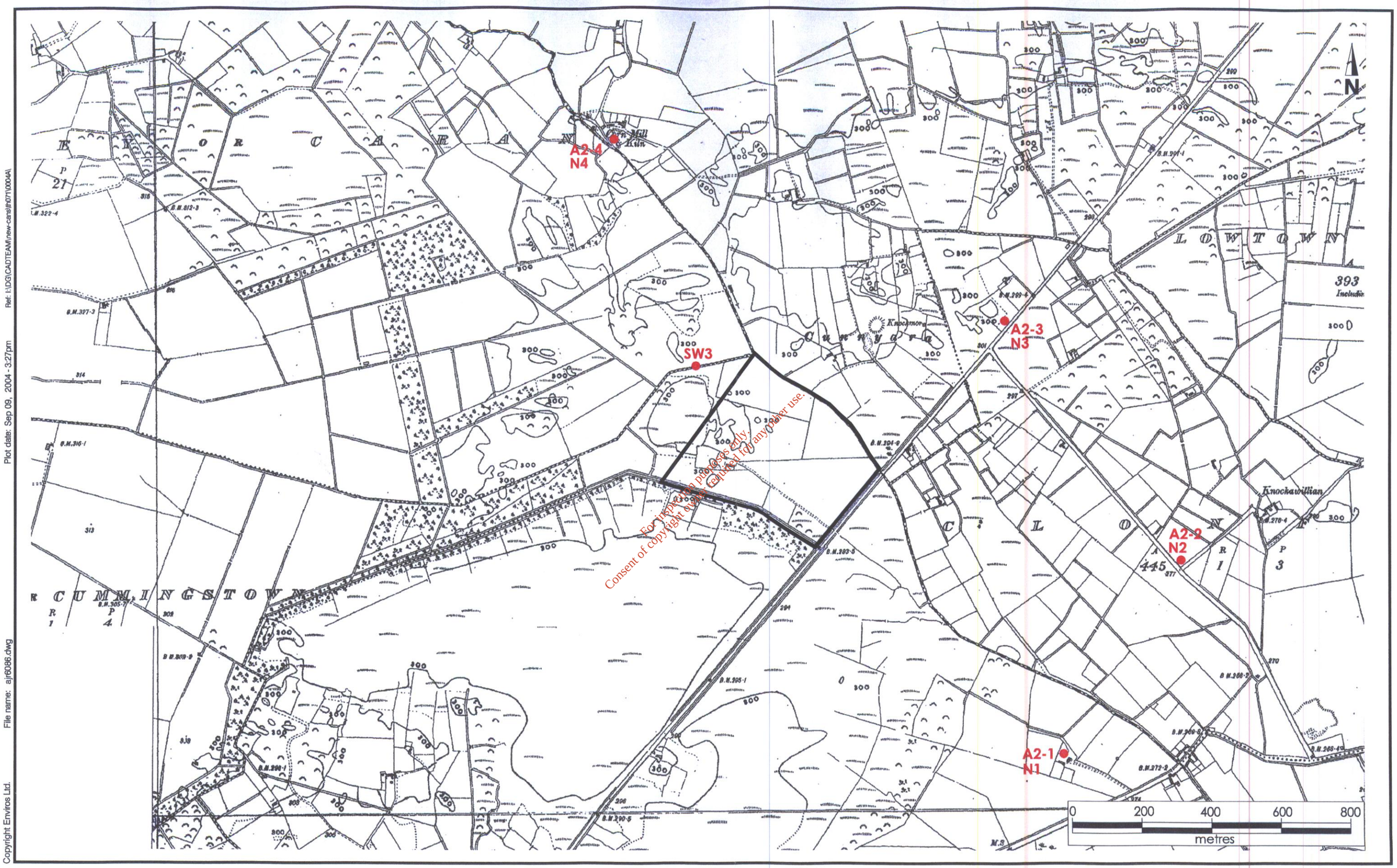
ATTACHMENT J

MONITORING POINTS (a)

KEY:

✱ Monitoring Point Location



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ATTACHMENT J
MONITORING POINTS (b)

KEY:
- Monitoring Point Location