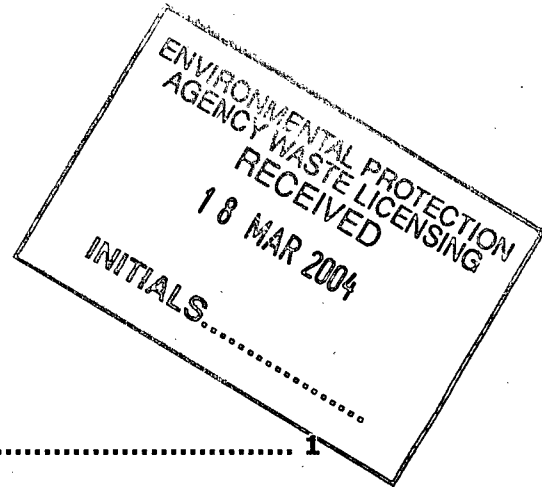


SECTION 4

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4. ENVIRONMENTAL MONITORING 1

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4. ENVIRONMENTAL MONITORING

A number of waste licenses have been issued which encompass similar waste management activities as the proposed development at Whitestown Lower. These waste licenses were reviewed to develop a proposed monitoring regime. This regime is for guidance, and is likely to be superseded once a waste licence for the proposed facility is issued.

Figure 4.1 depicts the location of all proposed monitoring points at the proposed Whitestown facility. It is noted that the proposed monitoring locations are outside the proposed footprint for development. Table 4.1 depicts the proposed monitoring locations. The proposed monitoring regime is presented in Table 4.2. Table 4.3 depicts the proposed analytical parameters for groundwater, surface water and leachate.

Some baseline sampling has already been undertaken at this site at the existing monitoring points.

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Table 4.1: Proposed Monitoring Points and Grid Reference Locations

MEDIA	LOCATION
DUST	D-1
	D-2
	D-3
	D-4
	D-5
ODOUR	OD-1
	OD-2
	OD-3
NOISE	N-1
	N-2
	N-3
	N-4
	N-5
	N-6
LANDFILL GAS (OFFICES & BUILDINGS)	Office 1
	Office 2
	BUILDINGS
	BUILDINGS
LANDFILL GAS (BOREHOLES)	G-1
	G-2
	G-3
	G-4
	G-5
	G-6
	G-7
	G-8
LANDFILL GAS (FLARE)	Flare
GROUNDWATER	MW-3
	MW-4
	MW-6
	MW-7
	MW-8
	MW-9
	MW-10
MW04-4	
SURFACE WATER	SW-2
	SW-3
	SW-5
SURFACE WATER DISCHARGE MONITORING POINT	S-1
	S-2
	S-3

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Table 4.2: Proposed Monitoring Regime at the Whitestown Lower Facility

Media	Parameter	Frequency	ELV*	Comments
Air	Dust	Three times annually	350 mg/m ³ /day	It is proposed to monitor dust at the locations shown in Figure 4.1. In addition the site manager will observe and record dust generation daily. Complaints will be recorded and appropriate actions taken.
	Odour	Annually	N/A	Parameters tested will include VOCs, mercaptans, hydrogen sulphide.
	Noise	Annually	Day: 55 dB(A) Night: 45 dB(A)	It is proposed to monitor noise at the 6 locations shown in Figure 4.1.
Landfill Gas Monitoring Boreholes	CH ₄ , CO ₂ , O ₂ , Atmospheric Pressure, Temperature	Monthly	CH ₄ - 1% v/v (20% LEL) CO ₂ - 1.5% v/v	The concentration of methane, carbon dioxide, and oxygen will be measured in landfill perimeter gas monitoring boreholes and in shallow gas monitoring boreholes near the offices and canteen. Readings will also be taken in the site offices and RRB.
Landfill Gas Site Offices & Buildings		Weekly		
Landfill Gas Flare Inlet	CH ₄ , CO ₂ , O ₂ , S, Cl, Fl	Continuous Annually	To be agreed with Agency	Appropriate sampling methods will be adopted.
Landfill Gas Flare Outlet	CO, NO _x , SO ₂ , TOC, HCL, HFL	Continuous Annually	To be agreed with Agency	Appropriate sampling methods will be adopted.
Groundwater	Levels	Monthly	Trigger levels will be established	A minimum of one upgradient and three downgradient boreholes will be sampled quarterly.
	Quality	Quarterly		Standard and extensive list of parameters for groundwater will be used (see Table 4.3)
Surface Water	Visual Inspection	Weekly	Trigger levels will be established.	Discharge from site drains will be inspected weekly and sampled quarterly (S1 to S3).
	Quality	Quarterly		The three sampling locations along the Carrigower River, as shown on Figure 4.1 will be used for surface water monitoring. Standard and extensive list of parameters for Surface Water will be used (see Table 4.3)
	Ecological Assessment	Annually	N/A	This will be carried out by a third party.

Table 4.2: Proposed Monitoring Regime at Whitestown Lower Facility (cont'd)

Leachate	Levels	Daily	N/A	Pressure Transducers will be used to record leachate levels.
	Quality	Quarterly	For leachate tankered to a Wastewater Treatment Plant: pH 6-8 COD 25.000 ppm	Leachate composition will be monitored at the leachate holding tank. Standard and extensive list of parameters (see Table 4.3)
Meteorological	Precipitation Volume, Temperature, Wind Force & Direction, Evaporation, Atmospheric Pressure, Humidity	Daily	Not applicable	A meteorological station will be installed. Evaporation and evapotranspiration data will be obtained from a nearby Met station.

* ELV – Emission Limit Value.

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**Table 4.3: Monitoring Parameters for Surface Water, Groundwater, and Leachate
(Based on Waste Licence No. 165-1)**

Parameter	Surface Water* Monitoring Frequency	Groundwater Monitoring Frequency	Leachate Monitoring Frequency
Odour/Visual Inspection	Weekly	Quarterly	Biannually
Groundwater Level	Not Applicable	Monthly	Not Applicable
Leachate Level	Not Applicable	Not Applicable	Continuous
Flow	Weekly	Not Applicable	Not Applicable
Ammoniacal Nitrogen	Quarterly	Quarterly	Biannually
BOD	Quarterly	Not Applicable	Biannually
COD	Quarterly	Not Applicable	Biannually
Chloride	Quarterly	Quarterly	Biannually
Fluoride	Not Applicable	Quarterly	Biannually
Sulphate	Quarterly	Quarterly	Biannually
Phosphorus	Quarterly	Quarterly	Biannually
Total orthophosphate	Quarterly	Quarterly	Biannually
Dissolved Oxygen	Quarterly	Quarterly	Not Applicable
Electrical Conductivity	Quarterly	Quarterly	Biannually
pH	Quarterly	Quarterly	Biannually
Total Suspended Solids	Quarterly	Not Applicable	Biannually
Temperature	Quarterly	Quarterly	Biannually
Arsenic	Not Applicable	Quarterly	Biannually
Barium	Not Applicable	Quarterly	Biannually
Boron	Not Applicable	Quarterly	Biannually
Cadmium	Quarterly	Quarterly	Biannually
Calcium	Quarterly	Quarterly	Biannually
Chromium (Total)	Quarterly	Quarterly	Biannually
Copper	Quarterly	Quarterly	Biannually
Cyanide (Total)	Not Applicable	Quarterly	Biannually
Iron	Quarterly	Quarterly	Biannually
Lead	Quarterly	Quarterly	Biannually
Magnesium	Quarterly	Quarterly	Biannually
Manganese	Quarterly	Quarterly	Biannually
Mercury	Quarterly	Quarterly	Biannually
Nickel	Quarterly	Quarterly	Biannually
Potassium	Quarterly	Quarterly	Biannually
Selenium	Not Applicable	Quarterly	Not Applicable
Silver	Not Applicable	Quarterly	Not Applicable
Sodium	Quarterly	Quarterly	Biannually
Zinc	Quarterly	Quarterly	Biannually
List I/II organic substances	Quarterly	Quarterly	Biannually
Total Alkalinity	Quarterly	Quarterly	Biannually
Total Oxidised Nitrogen	Quarterly	Quarterly	Biannually

Table 4.3: Monitoring Parameters for Surface Water, Groundwater, and Leachate (Based on Waste Licence No. 165-1)

Total Organic Carbon	Quarterly	Quarterly	Biannually
Residue on evaporation	Not Applicable	Quarterly	Biannually
Faecal Coliforms	Quarterly	Quarterly	Not Applicable
Total Coliforms	Quarterly	Quarterly	Not Applicable
Phenol	Not Applicable	Quarterly	Not Applicable

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