

Attachment E

Emissions

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E.1 Emissions to Atmosphere

The following Section E1 includes details of all emissions to atmosphere relating to the waste material recovery facility at Kilmeage. Refer also to Environmental Monitoring Plan (F.1) with respect to location of emission points.

E1(a) Composting Emissions

Not applicable. No composting of green waste takes place at the facility.

E1(b) Particulates – waste storage/treatment/handling

The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

Relevant details with respect to fugitive dust emissions are discussed below under Section E1(g).i.

E1(c) Landfill Gas Emissions

Not applicable. The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

E1(d) Landfill Leachate Emissions

Not applicable. The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

E1(e) Infectious organisms/pathogens (clinical waste handling)

Not applicable. The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

E1(f) Thermal oxidizer Emissions

Not applicable. The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

E1(g) Other Emissions.**E1(g).i. Fugitive Dust Emissions**

The materials to be recovered are principally “soils and stone” and inert construction and demolition waste. Any dust generated by the operation will comprise inert particulate matter.

Experience of reclamation workings indicates that mechanical activity is the most significant factor in material erosion and dust generation. Dust emanates from the placement of materials, the movement of vehicles on internal roads and loading and processing operations. However, the effect of wind is also an important factor in dust generation and problems may arise at reclamation workings when both factors arise simultaneously.

The impact of fugitive dust will be direct, temporary and non-cumulative and largely confined to the application site.

Dust emissions from solids stored in the open.

Refer to Table E.1(iv): Emissions to Atmosphere (Minor /Fugitive) with respect to measures to control (abatement) of fugitive (ground) emissions.

Loading and unloading operations.

Refer to Table E.1(iv): Emissions to Atmosphere (Minor /Fugitive) with respect to measures to control (abatement) of fugitive (ground) emissions.

Cleaning operations.

Refer to Table E.1(iv): Emissions to Atmosphere (Minor /Fugitive) with respect to measures to control (abatement) of fugitive (ground) emissions.

Emissions from wastewater/leachate treatment (e.g. volatile organics).

Not applicable. The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

Emissions from any pressure release valves on waste liquid tanks.

Not applicable. The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste.

Emissions from composting, including odour and bioaerosols.

Not applicable. No composting of green waste takes place at the facility.

TABLE E.1(i) LANDFILL GAS FLARE EMISSIONS TO ATMOSPHERE

Emission Point:

Emission Point Ref. N ^o :	NOT APPLICABLE
Location:	
Grid Ref. (12 digit, 6E,6N):	
Vent Details Diameter:	
Height above Ground(m):	
Date of commencement of emission:	

Characteristics of Emission:

CO		mg/m ³
Total organic carbon (TOC)		mg/m ³
NO _x		mg/Nm ³ 0°C. 3% O ₂ (Liquid or Gas), 6% O ₂ (Solid Fuel)
Maximum volume of emission		m ³ /hr
Temperature	°C(max) °C(min) °C(avg)	

(i) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up/shutdown to be included*):

Periods of Emission (avg)	_____ min/hr _____ hr/day day/yr
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TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. Nº:	NOT APPLICABLE
Source of Emission:	
Location:	
Grid Ref. (12 digit, 6E,6N):	
Vent Details Diameter:	
Height above Ground(m):	
Date of commencement:	

Characteristics of Emission:

(i) Volume to be emitted:	NOT APPLICABLE		
Average/day	m ³ /d	Maximum/day	m ³ /d
Maximum rate/hour	m ³ /h	Min efflux velocity	m.sec ⁻¹
(ii) Other factors			
Temperature	°C(max)	°C(min)	°C(avg)
For Combustion Sources:			
Volume terms expressed as:	<input type="checkbox"/> wet.	<input type="checkbox"/> dry.	_____ %O ₂

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included*):

Periods of Emission (avg)	_____ min/hr _____ hr/day day/yr
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TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE- Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: NOT APPLICABLE

Parameter	Prior to treatment ⁽¹⁾				Brief description of treatment	As discharged ⁽¹⁾					
	mg/Nm ³		kg/h			mg/Nm ³		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
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1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iv): EMISSIONS TO ATMOSPHERE - Minor /Fugitive

Emission point Reference Numbers	Description	Emission details ¹				Abatement system employed
		material	mg/Nm ³ (2)	kg/h.	kg/year	
*	Internal Haul Roads	Dust	Unknown	Unknown	Unknown	<p>During dry weather the haul roads are sprayed with water to dampen any likely dust blows. A water bowser will also be provided for use on temporary haul roads and active fill areas.</p> <p>Consideration will be given to location of mobile plant so as to ensure that any principle dust sources cannot adversely affect sensitive off-site locations. Static and mobile wet dust suppression systems will be located at strategic points in the process if required.</p> <p>Drop heights will be kept to a minimum by using short conveyors and maintaining stocks under the head drum load out points.</p> <p>A wheel wash facility has been installed on site and all vehicles are required to pass through the wheel wash on exiting the site.</p> <p>A sprinkler system has been installed on the site access road and is in operation during periods of dry weather.</p> <p>Main site haulage routes within the site shall be maintained with a good temporary surface, as is the case at present.</p> <p>All internal roadways will be adequately drained, to prevent ponding.</p> <p>A tractor with a road sweeper attachment will be provided to ensure that the site entrance and adjoining public roadway is regularly cleaned. The sweeper will be readily available at short notice to sweep up any materials which may accidentally fall onto the public roadway.</p> <p>Suitable vegetation is to be provided on restored areas at the earliest opportunity.</p> <p>Ongoing dust monitoring to ensure threshold limits are not exceeded</p>
*	Tipping Area	Dust	Unknown	Unknown	Unknown	
*	Processing Area	Dust	Unknown	Unknown	Unknown	

1 The maximum emission should be stated for each material emitted, the concentration should be based on the maximum 30 minute mean.

2 Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C/101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

* **Location Varies dependent on area of site being restored (Refer also to Environmental Monitoring Plan (F.1))**

E.2 Emissions to Surface Water

As the only material to be imported to site is “Soil and stone” and inert construction and demolition waste there will be no source of possible contamination of surface waters. The natural drainage pattern existing on site means that rain water falling on the site percolates through the existing soil strata (sand and gravel) to the underlying bedrock. The existing drainage pattern is expected to remain unaltered following cessation of the reclamation operations.

The wash-water from the existing wheel-wash is recycled within a self-contained holding tank with overflow to settlement tank. The tank is periodically cleaned out and the dried silt incorporated within the restoration scheme.

There are no surface water courses adjoining the site. Surface water-off within the site percolates to ground through the floor of the sand and gravel pit into the underlying bedrock. There is no discharge of surface water run-off from the site.

Potential impacts on surface water receptors are therefore not carried forward for impact assessment as there are no local receptors.

No surface water monitoring is proposed as there are no natural water features at or close to the site.

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TABLE E.2(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point: NOT APPLICABLE

Emission Point Ref. N°:	
Source of Emission:	
Location:	
Grid Ref. (10 digit, 5E,5N):	
Name of receiving waters:	
Flow rate in receiving waters:	_____ m ³ .sec ⁻¹ Dry Weather Flow _____ m ³ .sec ⁻¹ 95%ile flow
Available waste assimilative capacity:	_____ kg/day

Emission Details:

(i) Volume to be emitted			
Normal/day	_____ m ³	Maximum/day	_____ m ³
Maximum rate/hour	_____ m ³		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included*):

Periods of Emission (avg)	_____ min/hr _____ hr/day _____ day/yr
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TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number: NOT APPLICABLE

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	

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E.3 Emissions to Sewer

On site activities will not discharge to any sewerage system. It is proposed to continue using the existing toilet facility which discharges to a c. 2m diameter holding tank to the rear of the site office. The holding tank is periodically emptied and disposed of offsite by a licensed waste disposal contractor to an appropriate disposal facility. The location of the holding tank is shown on the attached Figure D.1.1.

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TABLE E.3(i): EMISSIONS TO SEWER (One page for each emission)

Emission Point: NOT APPLICABLE

Emission Point Ref. N ^o :	/
Location of connection to sewer:	
Grid Ref. (10 digit, 5E,5N):	
Name of sewage undertaker:	

Emission Details:

(i) Volume to be emitted			
Normal/day	m ³	Maximum/day	m ³
Maximum rate/hour	m ³		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included*):

Periods of Emission (avg)	_____ min/hr _____ hr/day day/yr
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TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number: NOT APPLICABLE

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	

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E.4 Emissions to Groundwater

Given the hydrogeological setting, it is considered that the proposed development has the potential to impact on groundwater in terms of both the groundwater quality and the groundwater flow regime.

During the development and operation of the site there is a risk of groundwater pollution from the following potential sources:

- Accidental spillage of fuels and lubricants by construction plant placing the inert fill and other operational procedures;
- Increase in suspended solids and potential for contaminated runoff entering groundwater during development of the site; and,
- Rogue loads of contaminated material being deposited at the site.

Without mitigation, or consideration of operational procedures, infilling the void on the pit floor with low permeability inert fill material has the potential to create a low permeability zone or zones and therefore impair recharge/infiltration. This has potential to alter the groundwater recharge patterns at the site.

A detailed Geological and Hydrogeological Assessment has been carried out as part of the Waste Licence Application. This report assesses the potential impacts of the proposed restoration infilling on the environment and provides suitable mitigation measures for the proposed extraction works; and input into developing the restoration plan for the pit in terms of minimising both potential hydrogeological and hydrology impacts (Refer to Attachment I.2.1).

A groundwater monitoring programme will also be put in place to ensure that there is no impact on water quality as a result of the recovery operations.

TABLE E.4(i): EMISSIONS TO GROUNDWATER (1 Page for each emission point)

Emission Point or Area: NOT APPLICABLE

Emission Point/Area Ref. No:	
Emission Pathway: (borehole, well, percolation area, soakaway, landspreading, etc.)	
Location:	
Grid Ref. (10 digit, 5E,5N):	
Elevation of discharge: (relative to Ordnance Datum)	
Aquifer classification for receiving groundwater body:	
Groundwater vulnerability assessment (including vulnerability rating):	
Identity and proximity of groundwater sources at risk (wells, springs, etc):	
Identity and proximity of surface water bodies at risk:	

Emission Details: NOT APPLICABLE

(i) Volume to be emitted			
Normal/day	m ³	Maximum/day	m ³
Maximum rate/hour	m ³		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included*):

Periods of Emission (avg)	_____ min/hr _____ hr/day day/yr
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E.5 Noise Emissions

The main source of noise and vibration on site will be from:

- Movement of trucks on internal haul roads and tipping of material
- Bulldozer placing and grading the infill material
- Processing Plant

Given the nature of the development, the location of the above will vary dependent on area of site being restored (Refer to Figures D.1.1 to D.1.4 Site Infrastructure Plans). Relevant details with respect to noise sources are provided in the following Table E.5.(i). The results provided are based on monitoring of noise sources similar to those proposed at Kilmeage.

Refer to Attachment F for details with respect to attenuation and noise control.

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Table E.5(i): NOISE EMISSIONS - Noise sources summary sheet

Source	Emission point Ref. No	Equipment Ref. No	Sound Pressure ¹ dBA at reference distance (10m)	Octave bands (Hz) Sound Pressure ¹ Levels dB(unweighted) per band								Impulsive or tonal qualities	Periods of Emission	
				31.5	63	125	250	500	1K	2K	4K			8K
Trucks	*		75											Intermittent 0800 to 1800 hrs
Bulldozer	*		78.3	69.2	72.9	72.4	66.1	69.3	67.5	64.8	61.1	57.3	Non Discernible during monitoring	Intermittent 0800 to 1800 hrs
Processing Plant	*		79.5	64.6	76.9	74.9	72.5	68.9	72	69.6	67.7	58.8	Non Discernible during monitoring	Campaign Basis 0800 to 1800 hrs

1. For items of plant sound power levels may be used.
2. Periods of emission should state if the plant item in question operates on a continuous or intermittent basis. If intermittent then further details of the hours of operation and any potential impulsive components associated with the source should be clearly identified.

* Location Varies dependent on area of site being restored (Refer also to Environmental Monitoring Plan (F.1))

E.6 Environmental Nuisances

E.6.1 Bird Control

It is not envisaged that birds will be a problem as all infill material is inert and no domestic or municipal waste will be accepted on site. As such there will be no need for any specific controls for birds.

E.6.2 Dust Control

Refer to Table E.1(iv): Emissions to Atmosphere (Minor /Fugitive) with respect to measures to control (abatement) of fugitive (ground) emissions i.e.

- During dry weather the haul roads and stockpiles will be sprayed with water to dampen any likely dust blows. A water bowser will be maintained on site for this purpose.
- Consideration will be given to location of mobile plant so as to ensure that any principle dust sources cannot adversely affect sensitive off-site locations.
- Static and mobile wet dust suppression systems will be located at strategic points in the process if required.
- Drop heights will be kept to a minimum by using short conveyors and maintaining stocks under the head drum load out points.
- The site access road between the site entrance and wheelwash has been provided with an asphalt surface. There is no evidence of mud and debris being carried out on to the public road.
- Imported clean construction and demolition waste (concrete and brick) will be used to construct internal haul roads as required.
- A wheel wash facility has been installed on site and all vehicles are required to pass through the wheel wash on exiting the site.
- A sprinkler system has been installed on the site access road and is in operation during periods of dry weather.
- Main site haulage routes within the site shall be maintained with a good temporary surface, as is the case at present.
- All internal roadways will be adequately drained, to prevent ponding.
- A tractor with a road sweeper attachment will be provided to ensure that the site entrance and adjoining public roadway is regularly cleaned. The sweeper will be readily available at short notice to sweep up any materials which may accidentally fall onto the public roadway.
- Suitable vegetation is to be provided on restored areas at the earliest opportunity.
- Ongoing dust monitoring to ensure threshold limits are not exceeded.

E.6.3 Fire Control

The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste. As such it is not expected that the site activities concerned are likely to give rise to any significant risk of fire.

In the event of a fire, the employee on the scene shall raise the alarm with all staff in the immediate area and confirm that all staff are present and accounted for. Assist in containing the fire using the appropriate extinguisher – only if it is safe and they are confident to do so. All personnel will have also undergone appropriate training and will be aware of potential hazards on site.

In the event where a fire cannot be controlled the appropriate emergency services will be contacted either by dialling “999 or 112” and informing the operator of which service is required. An emergency contact list shall be maintained at the site office.

The incident will also be reported immediately to the Site Foreman/Operations Manager.

If the fire is located adjacent to explosive or further flammable materials the area should be vacated immediately and personnel should retreat a safe distance. Emergency services should be made aware of any potential hazards on site when they arrive.

- A water supply will be available from an on-site groundwater well.
- Fire hoses and extinguishers will be available on site.
- No burning of waste will be permitted on site.
- There will be no unauthorised people allowed access to the site.

E.6.4 Litter Control

The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste. As such it is not expected that the site activities concerned are likely to give rise to litter.

The site entrance gates remain locked outside of normal working hours and public warning notices are posted at appropriate locations along the site boundary. The site is also monitored with CCTV at the entrance. These measures are to ensure that there is no unauthorised dumping of unacceptable wastes outside of operating hours likely to give rise to nuisance.

A daily site inspection including site boundaries adjoining public roads shall be carried out. Any litter observed will be removed as soon as possible and disposed of to a suitable Waste Management Facility.

No waste oil products are stored on site. Waste oils will be disposed of by a licensed waste contractor and removed off site. Batteries, scrap metal etc, will be removed from site for recycling by approved licensed contractors. A licensed waste collection contractor will remove any domestic waste requiring disposal to a licensed waste management facility.

Occasionally a load will contain minor contaminants (e.g. plastics, rebar, wood and paper). These items will be removed on inspection by a site operative and stored in a designated quarantine area pending removal offsite by a licensed waste disposal contractor to an appropriate disposal facility.

E.6.5 Traffic Control

Car parking including visitors parking is provided at the site entrance in front of the main office. Trucks entering the site report to the site office where each load is inspected as to its suitability to be recovered on site.

An automatic barrier ensures there is no unauthorised entry to the site. The site entrance has also been designed to ensure that queuing for vehicles entering the site is accommodated within the curtailage of the site entrance.

All trucks exiting the site leave through the existing wheelwash facility.

Traffic direction signs, warning signs, speed limit signs are established throughout the site.

E.6.6 Vermin Control

The only waste to be accepted at the facility for recovery comprises inert soils and stone, and inert construction and demolition waste. As such the site activities concerned will not give rise to a need to introduce vermin control.

E.6.7 Road Cleansing

The site access road between the site entrance and wheelwash has been provided with an asphalt surface. Imported clean construction and demolition waste (concrete and brick) will be used to construct internal haul roads as required.

A road sweeper attachment fitted to a tractor will be used to ensure that the site entrance and adjoining public roadway is regularly cleaned. The sweeper will be readily available at short notice to sweep up any materials which may accidentally fall onto the public roadway.

The existing wheelwash facility will be maintained and continue to be operated for the duration of the development. The wheelwash is constructed of mass concrete, which forms a trough type structure which all trucks are required to pass through leaving the site. As trucks enter the wheelwash a number of shaker bars aid the release of mud from tyre grooves.