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Lydiate Lane Quarry

Emissions Management and Monitoring Plan

J A Jackson Contractors (Leyland) Limited

Report No. 14-K0217-BLP-ENV-00014
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1 Introduction

1.1 Report Objectives

This Emissions and Monitoring report has been prepared by ByrneLooby Partners (UK) Limited on behalf of J A Jackson Contractors (Leyland) Limited (the Operator) to support a permit variation to environmental permit reference EPR/LB3834AE/V004 for Lydiate Lane Quarry (the Site). The Site is permitted to operate as an inert landfill.

This permit variation application proposes to change the classification of the inert landfill to allow for silt and clay from the soil washing activity located on another site in the Operator's portfolio, to be used in the quarry restoration.

This report updates the Emission and Monitoring report (reference1607/R/007/01) submitted with the original permit application in 2012 to take into account the proposed changes.

1.2 Structure of Application and Accompanying Details

This report provides a summary of the potential emissions identified in other parts of the permit variation application and details monitoring regimes for the proposed installation. Each type of emission is considered in a separate section of this report.

2 Landfill Gas

2.1 Monitoring Point Locations

No changes are proposed to monitoring regime already permitted. The production of landfill gas will continue to be negligible due to the non-biodegradable nature of the proposed waste types.

The location of existing and proposed landfill gas monitoring points are shown on the Environmental Monitoring Point Location Plan (drawing reference 1607/1/007 Rev C).

2.2 In Waste Gas Monitoring

In-waste monitoring points will be retro-installed following the completion of each phase of waste deposition with a minimum of two per hectare in accordance with current Environment Agency guidance. Monitoring will be in accordance with Table S3.2 of the permit which is reproduced below in Table 1 for reference.

Table 1 – Landfill gas: in-waste monitoring – Action level and monitoring requirements

Monitoring point Ref. description	Parameter	Action level (includes units)	Monitoring frequency
MPP*	Methane	1.5 %v/v	Quarterly
	Carbon Dioxide	No limit	
	Oxygen	No limit	
	Atmospheric Pressure	No limit	
	Differential Pressure	No limit	
	Flow rate	No limit	
	Gas balance	No limit	
	Meteorological data	No limit	

*"MPP" means the monitoring point plan, required to specify routine monitoring locations. This includes locations of all existing and any new monitoring points.

The action level applied to the in-waste monitoring boreholes was based on the Environment Agency's Guidance Document reference 5.02: The Surrender of Permits for the Permanent Deposit of Waste (September 2010). This stated that where concentration of methane exceeds 1.5 %v/v, gas flow rates should be measured, to determine if the concentrations recorded pose a significant risk of off-site lateral migration.

2.3 Perimeter Gas Monitoring

Monitoring will continue to be undertaken at existing boreholes BH08/01R, BH08/02, BH08/03, BH08/04 and BH13/03 in accordance with Table S3.2A and S3.2B of the permit. These tables have been reproduced below in Tables 2 and 3 for reference.

Table 2 – Landfill gas: off-site/perimeter monitoring – compliance limit and monitoring requirements

Monitoring point Ref. description	Parameter	Action level (includes units)	Monitoring frequency
MPP	Methane	No limit	Quarterly
	Oxygen		
	Atmospheric Pressure		
	Differential Pressure		
	Gas balance		
	Meteorological data		

Table 3 – Landfill gas: off-site/perimeter monitoring – action levels and monitoring requirements

Monitoring point Ref. description	Parameter	Action level (includes units)	Monitoring frequency
MPP	Carbon Dioxide	No limit	Quarterly

Compliance limits are not required, but assessment limits may need to be established if the in-waste assessment criteria are exceeded.

2.4 Landfill Gas Action Plan

If the measured concentrations and flows recorded in the in-waste monitoring boreholes exceed the assessment levels specified in Table 1, during a monitoring visit, then the following actions will take place:

- The monitoring will be repeated within 10 working days to confirm the elevated reading;
- A review of perimeter borehole monitoring data will be carried out to establish any observable related trends;
- The frequency of monitoring will be re-assessed and may be increased following a risk assessment specific to the monitoring location, gas concentration and gas pressure;
- Additional samples may be subject to more detailed laboratory analysis;
- If concentrations continually exceed the assessment criteria, it may be required to establish assessment criteria for the perimeter boreholes;
- If necessary remedial action will be undertaken following consultation with the Environment Agency.

3 Leachate

3.1 Monitoring Point Locations

It has been demonstrated by the 2023 Hydrogeological Risk Assessment Review (HRAR) (report 14-k0217-BLP-ENV-00013) and through experienced gained at other similar sites that by controlling the nature of the waste inputs, leachate extraction will not be necessary and specified leachate limits will not be required.

Periodic monitoring is proposed for establishing surrender point. One leachate monitoring chamber will be installed in each cell with radial spine drains. Imported stone (or similar applicable material) will be utilised to surround the spine drains. The spine drains will fall to sidewall risers as illustrated on updated drawing referenced 1607/1/006 Rev A.

No leachate extraction is proposed due to the likely high density, low permeability of the fill and low leachate generation, although incidental surface water run-off will be managed in accordance with the existing surface water management scheme appended to the 2023 HRAR (report 14-K0217-BLP-ENV-00013).

3.2 Leachate Quality

Leachate level and quality will be monitored from the proposed leachate monitoring points. A monitoring schedule is proposed in Table 4.

Table 4 – Leachate Monitoring Schedule

Monitoring point reference	Parameter	Monitoring frequency
All in waste wells	Water Level	Quarterly
	Dip to base	Quarterly during infilling then Annually
MPP	pH, Electric Conductivity, Chloride, Sulphate, Ammoniacal Nitrogen	Quarterly
	Total Organic Carbon, Calcium, Magnesium, Sodium, Potassium, Alkalinity, Total Organic Nitrogen, Cadmium, Arsenic, Lead, Chromium, Copper, Nickel, Zinc, Iron and Manganese	Six – Monthly

No leachate level limits will apply.

Leachate quality (pore-water with the soil fill or carrier water for clay/silt fill) will be analysed to the specification and frequency detailed in Table 4. The frequency of the leachate monitoring will be reviewed as more data is obtained or when leachate composition can be shown to be more consistent.

Following the installation of an engineered cap on each phase (i.e. non-operational), the frequency of the hazardous substance screen will be reduced to once every four years

4 Groundwater

4.1 Monitoring Point Locations

Groundwater monitoring will continue in accordance with Tables S3.1 and S3.3 of the permit. Monitoring is currently obtained from the superficial strata at:

- BH08/03 (upgradient – east) monitored periodically;
- BH08/04 and BH13/03 (cross gradient – north and south);
- BH08/02 (downgradient) monitored historically; and,
- BH08/01R (downgradient – west).

4.2 Groundwater Quality

The groundwater monitoring regime included in Table S3.3 is reproduced below in Tables 5 for reference.

Table 5 – Groundwater – other monitoring requirements

Monitoring point reference	Parameter	Monitoring frequency
Up gradient MPP	Water Level, Electric Conductivity, Chloride, Ammoniacal Nitrogen, pH, Temperature, Chemical Oxygen Demand, Sulphate, Cadmium	Quarterly
	Total Alkalinity, Magnesium, Potassium, Calcium, Sodium, Chromium (VI), Copper, Iron, Lead, Nickel, Zinc, Manganese, Selenium, Barium, Beryllium, Boron, Dissolved Oxygen, Total Organic Carbon, Total Organic Nitrogen, Vanadium, Arsenic, Mercury	Annually
Down gradient MPP	Water Level, Electric Conductivity, Chloride, Ammoniacal Nitrogen, pH, Temperature, Chemical Oxygen Demand, Sulphate, Cadmium	Quarterly
	Total Alkalinity, Magnesium, Potassium, Calcium, Sodium, Chromium (VI), Copper, Iron, Lead, Nickel, Zinc, Manganese, Selenium, Barium, Beryllium, Boron, Dissolved Oxygen, Total Organic Carbon, Total Organic Nitrogen, Vanadium, Arsenic, Mercury	Annually
MPP	Base of monitoring point (mAOD)	Annually

4.3 Groundwater Quality Compliance Limits

The original HRA and the 2023 HRAR has demonstrated that the operations at the Site have negligible risk to groundwater and that there will be no discernible discharge of hazardous and non-hazardous substances. Despite the low-risk, monitoring of groundwater quality is undertaken to ensure that during the operational and post closure phases of the landfill, no detrimental effects to the environment occur. The compliance limits are reproduced below in Table 6 for reference. No changes are proposed.

Table 6 – Groundwater – emission limits and monitoring requirements

Monitoring point reference	Parameter	Limit (including units)	Reference Period	Monitoring frequency
BH08/01, BH08/02 and BH08/04	Ammoniacal Nitrogen	4.5 mg/l	Spot Sample	Quarterly
	Chloride	250 mg/l		
	Cadmium	0.9 µg/l		

4.4 Groundwater Contingency Action Plan

Should the compliance limits be exceeded, actions will be taken in accordance with the site EMS procedures. The action plan is summarised below, and actions should be selected as appropriate:

- the result will be confirmed by the laboratory or the sample re-tested if deemed necessary;
- the Environment Agency will be informed under the conditions of the Permit;
- exceedance confirmation through repeat sampling;
- review monitoring data to establish significance and apparent trends;
- review as necessary the management and operations procedures and implement any actions if exceedance is considered as a significant risk to the environment; and
- if exceedances are continued, the conceptual model and ultimately the HRAR will be reviewed.

If the risks are unacceptable, procedures will be establish for implementing permanent corrective measures.

5 Surface Water

Surface water will continue in accordance with Table S3.4 of the permit. Monitoring is currently obtained from the reedbed outflow location (SW1).

The table is reproduced below in Table 7 for reference.

Table 7 – Surface water – other monitoring requirements

Monitoring point Ref./Description	Parameter	Monitoring frequency	Monitoring standard or method
MPP	Temperature, Dissolved Oxygen, pH, Electrical Conductivity, Total Suspended Solids, Ammoniacal nitrogen, Chloride, Sulphate, Biological Oxygen Demand, Chemical Oxygen Demand, Total Organic Carbon, Total Oxidised Nitrogen	Quarterly	Spot sample

No compliance limits are in place and none are proposed.

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