



Wakerley Inert Landfill

Environmental Permit Application

Environmental Management and Monitoring Plan

Updated May 2020 (Updated October 2020)

Prepared on behalf of Mick George Limited





Document Control

Document:	Environmental Management and Monitoring Plan	
Project:	Wakerley Inert Disposal Permit Application	
Client:	Mick George Limited	
Job Number:	A099077	
File Origin:	\\southampton14\Data\Projects\Mick George (G05059)\^Wakerley\A099077 (Wakerley Inert Disp Perm App)\Reports	
Revision:	Draft	
Date:	October 2020	
Prepared by: Alice Shaw	Checked by: Jessica Allan	Approved By: Michael Jones
Description of revision: Addition of new borehole information and changed compliance limits		



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1.0 Introduction

1.1 Report Context

- 1.1.1 This section of the Environmental Permit application corresponds to Part B4 of the application forms, specifically detailing the environmental management and monitoring plan for the importation of suitable inert waste at Wakerley.
- 1.1.2 The Environmental Permit application has been prepared by WYG on behalf of the Operator, Mick George Limited (Mick George).
- 1.1.3 This report has been prepared in accordance with the Environment Agency's (EA) Guidance for the Landfill Sector and LFTGN 02: Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water and with reference to the Hydrogeological Risk Assessment (HRA) and the Environmental Risk Assessment (ERA).



2.0 Groundwater Management and Monitoring

2.0.1 Adherence to the Waste Acceptance Criteria will ensure that the waste deposited at the site complies with the inert classification, thereby mitigating any risk to groundwater.

2.0.2 An HRA has been prepared for the inert landfill application (Appendix F of the main application). The objective of the HRA is to assess the potential risk of significant impacts on groundwater quality as a result of the proposed development, to derive control and compliance limits for groundwater and surface water and to provide recommendations for contingency actions on the event of exceedances of those levels.

2.1 Groundwater Monitoring Schedule

2.1.1 The parameters to be sampled and monitoring frequency to be included in the Environmental Permit are presented in Table 1 below. These requirements are considered adequate in providing an ongoing characterisation of the groundwater conditions.

Table 1: Proposed Groundwater Monitoring Determinands and Sampling Frequency

Monitoring Location	Quarterly	Annually	Annually for first six years of operation then every two years
BH01S, BH01D, BH02S, BH02D, BH03S, BH03D, BH04S, BH04D, BH05S and BH05D (as shown on Drawing Number MGL-A099077-PER-02A)	Water Level, Electrical Conductivity, Chloride, Ammoniacal Nitrogen, pH	As quarterly plus Total Alkalinity, Magnesium, Potassium, Sulphate, Calcium, Sodium, Chromium, Copper, Iron, Lead, Nickel, Zinc, Manganese, Selenium, Cyanide Barium, Boron, Cadmium, Total Phenols, TOC, TON, Mineral Oils/hydrocarbons.	Arsenic, Mercury, Benzene, Toluene, Ethyl Benzene, Xylene, Benzo(a)pyrene, Poly Chlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH)

Compliance Levels Contingency Plan

2.1.2 Compliance limits have been assigned based on current EA guidance provided in 'Hydrogeological Risk Assessments for Landfills and the derivation of Groundwater Control and Trigger Levels. Environment Agency. Ref. LFTGN01 (2003)'.

2.1.3 The proposed compliance limits for use in the environmental permit are outlined separately for



boreholes installed within the Lincolnshire Limestone and Northampton Sand Formation. Compliance points have been set at a midpoint between the maximum recorded background concentration and the UKDWS in accordance with EA guidance. Where maximum background concentrations are above the water quality standards, the maximum background concentration plus 20% is used as the compliance limits.

Table 2 – Lincolnshire Limestone Groundwater Compliance Points

Contaminant	Maximum Baseline Groundwater Concentration (mg/l)	Predicted Concentration Model 1 'Open Phase' 95 th %ile (mg/l)	Control Level (mg/l)	Compliance Limit (mg/l)
Arsenic	-	0.00107	-	0.005
Chromium	0.0076	0	-	0.0076
Lead	<0.001	0.00095	-	0.001
Mercury	<0.005	0.00000415	-	0.00001
Antimony	-	0.001	0.003	0.005
Ammoniacal Nitrogen	0.44	0.126	0.298	0.47
Barium	-	0.4	0.85	1.30
Cadmium	<0.08	0.001	0.00175	0.0025
Nickel	0.0034	0.008	0.0095	0.011
Selenium	0.003	0.002	0.00425	0.0065
Zinc	0.037	0.006	0.0215	0.037
Phenol	-	0.00237	0.005	0.0077

Table 3 – Northampton Sand Formation Groundwater Compliance Points

Contaminant	Maximum Baseline Groundwater Concentration (mg/l)	Predicted Concentration Model 1 'Open Phase' 95 th %ile (mg/l)	Control Level (mg/l)	Compliance Limit (mg/l)
Arsenic	-	0.00074	-	0.005
Chromium	<0.008	0	-	0.008
Lead	<0.001	0	-	0.001
Mercury	<0.00001	0	-	0.0001
Antimony	-	0.00027	0.0026	0.005
Ammoniacal Nitrogen	1.20	1.07	1.20	1.20
Barium	NM	0.29	0.795	1.30
Cadmium	<0.08	0.0013	0.00192	0.00254
Nickel	0.004	0.0099	0.011	0.012
Selenium	0.0038	0.0035	0.00535	0.0069
Zinc	0.048	0.035	0.048	0.048
Phenol	-	0.0012	0.00445	0.0077



2.1.4 Should site monitoring identify an increase in the concentration of the selected determinands then a series of contingency actions will be required. Suggested contingency actions, which require agreement with the EA, are presented in Table 4.

Table 4: Suggested Contingency Actions for Exceeding Groundwater Compliance Limits

Appropriate Contingency Action	Timescale
Advise Site Management	Immediately
Advise Environmental Manager of PQL	1 Week
Advise Environment Agency	1 Week
Confirm by repeat sampling and analysis	1 Month
Review existing monitoring information	1 Month
Review site management/operations, implement actions to prevent future failure of a compliance level	3 Months
Review assumptions in conceptual site model	3 Months
Review existing HRA Compliance Levels	6 Months
Consult EA about need for corrective action	6 Months

2.2 Quality Control Procedures

Monitoring Personnel

2.2.1 Monitoring will be undertaken by suitably trained person(s) by the site management, who are familiar with the monitoring procedures. The monitoring personnel will have access to the Environmental Permit and any relevant accompanying application documents to gain an understanding of the conditions applicable to groundwater monitoring (levels and quality). Personnel will also be familiar with the assessment criteria to identify compliance and assessment levels.

Monitoring Procedures

2.2.2 The groundwater levels will be measured prior to sampling using an electronic dip tape.

2.2.3 The groundwater samples will be collected using a portable electric submersible pump or other suitable sampling equipment. In order to obtain a sample of the groundwater, each monitoring borehole will be purged to at least three times the well volume to prevent sampling non-representative, stagnant samples.

2.2.4 All groundwater samples will be collected in 1 litre polyethylene or glass containers. Unless the



containers already contain a preservative, they will be flushed three times with the sample prior to filling.

- 2.2.5 Filled sample bottles will be stored upright in cool boxes with ice packs. Sample bottles will be pre-labelled in accordance with laboratory requirements and will be submitted to a UKAS accredited laboratory within 24 hours of collection, together with the sample details, tests and suites required. If samples have to be kept overnight, they will be stored in a fridge/cool box and maintained at approximately 4°C.

Recording and Reporting

- 2.2.6 A hard copy of the sampling results will be stored on site for the duration of the site operations.
- 2.2.7 The site management will ensure that copies of the sampling results are sent to the EA in an agreed format and at quarterly frequencies.



3.0 Surface Water Management and Monitoring

- 3.0.1 The nearest surface water feature to the site is an eastwards flowing stream which runs along the southern boundary of the application site. The stream rises within Wakerley Great Wood and flows towards Laxton Hall. This is a tributary of Fineshade Brook which is classified as a main river and is a tributary of the River Welland. Fineshade Brook is located approximately 2km south east from the application site.
- 3.0.2 The River Welland is located approximately 850 north of the application site and flows in a north-easterly direction.
- 3.0.3 According to the Flood Map for Planning Service (FMPS), the application site is not situated in an area at risk of flooding.

3.1 Surface Water Management

- 3.1.1 Drainage from the site occurs to two local surface water catchments, the River Welland to the north and Fineshade Brook, a tributary of the River Welland, to the south. The surface water divide between the two catchments crosses the centre of the site from west to east and this will remain after site restoration.
- 3.1.2 In terms of the northern catchment, the current risk of flooding is considered to be low due to the presence of drainage ditches that are situated along the perimeter of the site. As part of the restoration scheme, it is proposed that these ditches will be retained in order to manage surface water run off.
- 3.1.3 In addition, as detailed on the restoration scheme (Drawing Number W4 18 02, attenuation ponds and wetlands will be constructed along the northern boundary. Given that the northern catchment drains northwards towards the River Welland, it is envisaged that any surface water run off from this catchment will drain towards the ponds and wetland areas before discharging to the existing ditches.
- 3.1.4 The southern catchment drains southwards and eastwards to tributaries of Fineshade Brook. As such, ponds and wetlands will be constructed along the southern boundary (as shown on Drawing Number W4 18 02) in order to attenuate any surface water run off that's generated in this



catchment. Discharge from the attenuation pond and wetland will occur at an off-site drainage ditch that is situated in the woodland to the east of the site (Wakerley Great Wood).

3.1.5 The restored landform will be similar to the pre-development profile. As such, in light of the measures detailed above, it is considered that there is no increased risk to flooding as a result of this application.

3.2 Surface Water Monitoring Schedule

3.2.1 The parameters to be sampled and monitoring frequency to be included in the Environmental Permit are presented in Table 5 below. These requirements are considered adequate in providing an ongoing characterisation of the groundwater conditions. The sampling location should be agreed with the EA following further discussions if they are required.

Table 5: Proposed Surface Water Monitoring Determinands and Sampling Frequency

Quarterly
pH, Iron, Electrical conductivity, Lead, Alkalinity as CaCO ₃ , Manganese, Ammoniacal Nitrogen, Magnesium, Mercury, Nitrogen, Nickel, Calcium, Chloride, Sodium, Chromium, Sulphate, Copper, Zinc

3.3 Contingency Plan

3.3.1 In the unlikely event of a pollution incident caused by a direct discharge of contamination e.g. leaking pipework, fuel spillage, the following emergency procedures will be implemented:-

- Immediately report incident to the Site Manager; and
- Identify source and prevent further leak/spillage.

3.3.2 For major fuel/oil spillage the following procedures will be implemented:-

- i) Clear the area immediately and extinguish any naked flames. Attempt to make a bund to contain the fuel/oil in order to limit the extent of the spillage;
- ii) If possible, try and contain the spill using absorbent materials available on site;
- iii) Phone 999, ask for the Fire and Rescue Service and request assistance;
- iv) Ring the EA the explain what has happened so they can take appropriate action;
- v) At no time put staff, customers or the public at risk;



- vi) If appropriate close the site, wait at the gate for emergency services and explain the situation prior to allowing access to site;
- vii) Do not allow staff or the public to go back into the site until authorised to do so;
- viii) Keep customers, and if appropriate public, informed about what is going on at all times;
- ix) Once it is safe to enter the site, re-open to customers and update the EA;
- x) Complete the site diary and any other paperwork about the incident; and
- xi) The resultant spillage material should be disposed of in accordance with Environmental Permitting requirements. Specialist advice must be sought in the event of any doubt.

3.3.3 For minor fuel/spillage implement the following procedure:-

- i) Clear the area immediately and extinguish any naked flames;
- ii) Lay absorbent material over the spill to soak up the spillage and if any drains are nearby place the absorbent material around the drain to stop any liquid going into any surface water gullies; and
- iii) Once the liquid has all been absorbed use a shovel to clear up the waste, put it in a plastic sack and then place it in the fullest container for non-recyclable waste for disposal via the normal route.

3.3.4 In the event of the pollution reaching a surface water course, implement remedial measures in accordance with the EA guidance. Undertake additional monitoring to ensure water quality does not exceed assessment criteria.



4.0 Landfill Gas Management and Monitoring

- 4.0.1 A Landfill Gas Risk Assessment (GRA) has not been prepared for Wakerley Inert Landfill, as Environment Agency Guidance Note H1 Annex I indicates that it is not a requirement for inert landfill sites. However, a screening report has been carried out in accordance with the requirements of Landfill Technical Guidance Note 03 (LFTGN03).
- 4.0.2 This Landfill Gas Screening Report indicates that there is unlikely to be a significant risk posed by the development. However, monitoring of the perimeter boreholes for landfill gas will be carried out in accordance with this Screening Report as detailed within Appendix G of the environmental permit application. The perimeter gas monitoring proposals including frequencies of monitoring are outlined in Table 6 below.

Table 6: Monitoring Programme

Monitoring Location	Parameter	Monitoring Frequency
BH01S, BH01D, BH02S, BH02D, BH03S, BH03D, BH04S, BH04D, BH05S and BH05D (as shown on Drawing Number MGL-A099077-PER-02A)	Methane, carbon dioxide, oxygen, meteorological data, atmospheric pressure, differential pressure, temperature.	Quarterly

- 4.0.3 Furthermore, in accordance with the EA’s guidance note on inert landfills, in-waste landfill gas monitoring infrastructure will be installed within each completed cell at a frequency of not less than 2 borehole per hectare. The locations of the in waste boreholes are shown on Drawing Number MGL/A108671/PER/03.
- 4.0.4 In-waste landfill gas monitoring will be carried out in accordance with the procedures set out in LFTGN03. The proposed monitoring programme is detailed in Table 8 below.

Table 8: In Waste Borehole Monitoring Programme

Parameter	Monitoring Frequency
Methane, carbon dioxide, oxygen, meteorological data, atmospheric pressure, differential pressure, temperature.	Quarterly



5.0 Meteorological Monitoring

- 5.0.1 The proposed landfill will only accept inert waste and with reference to the HRA and EA guidance, it is not considered necessary to manage and monitor leachate. This negates the need to monitor meteorological conditions for the purpose of using water balance calculations as a tool for evaluating leachate production.
- 5.0.2 Atmospheric pressure, temperature and ground conditions will be monitored and recorded during all monitoring visits.
- 5.0.3 Weather conditions that may be unfavourable to landfilling particularly dry loads will be used to determine the acceptability of such wastes on a particular day, for example strong winds given as severe weather warnings from the Meteorological Office.
- 5.0.4 Details on weather conditions will be recorded in the Site Diary on a daily basis.



6.0 Landfill Body Monitoring

6.0.1 Procedures will be in place to undertake routine surveys in order to record the following:-

- Surface area of waste;
- Volume of waste;
- Remaining capacity; and
- Settling behaviour.

6.0.2 Monitoring will be undertaken on an annual basis, or at a greater frequency determined by the site owner.



7.0 Amenity Management and Monitoring

7.0.1 An Environmental Risk Assessment (ERA) has been prepared in accordance with the EA's Risk Assessment guidance. It specifically deals with the following:-

- Particulate Matter Management and Monitoring;
- Noise Management and Monitoring;
- Odour Management and Monitoring;
- Mud Management and Monitoring;
- Litter Management and Monitoring; and
- Birds, Vermin and Insect Management and Monitoring.

7.0.2 Due to the inert nature of the waste, the site will not produce odour or litter nor will it attract birds, vermin and insects.

7.0.3 The ERA concluded that the risk of particulate matter and noise annoyance was not significant and therefore it is not proposed to implement monitoring regimes for these potential hazards.

7.0.4 The ERA also considered the risk of mud being transferred to the local highways as not significant. A wheel washing facility will be employed on site which will be used by HGVs before they leave the site. Water sprays will also be employed to dampen the access road. However, in the unlikely event that mud is deposited on the road then a road sweeper will be utilised as necessary.

7.0.5 The site is currently covered by planning permission 08/00026/MIN. This consent has planning conditions covering noise and dust.



8.0 Health Impact Monitoring

8.0.1 Due to the inert nature of the waste, it is considered unnecessary to undertake health impact monitoring on the surrounding population.



9.0 Aftercare Monitoring

- 9.0.1 It is proposed to continue the monitoring of groundwater and landfill gas during the aftercare period. At this stage it is proposed to monitor on the same basis as during the operational phase. Any changes to the monitoring frequency and analysis will be subject to agreement with the EA.



Drawings

MGL-A099077-PER-02A – Environmental Permit Boundary and Borehole Locations

W4 18 02 - Landscape Restoration Masterplan

MGL-A099077-PER-03 – In Waste Borehole Locations