Ravenhead Quarry

Environmental Risk Assessment (H1)

Booth Ventures Waste (North West) Limited

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Contents

1	Intro	oduction	1
	1.1	Background	1
	1.2	Assessment of Environmental Risk	2
2	Sco	pe of the Assessment	2
	2.1	Site Details and Proposed Operations	2
	2.2	Potential Hazards	2
	2.2.	1 Odour	2
	2.2.2	Noise and Vibration	3
	2.2.3	3 Dust	3
	2.2.4	4 Mud	4
	2.2.5	5 Litter	4
	2.2.6	S Pests and Vermin	4
	2.2.	7 Global Warming	5
	2.3	Potential Hazard Pathway	5
	2.3.2	1 Meteorological Conditions	5
	2.4	Probability of Exposure	6
	2.5	Hazard Receptors	6
	2.6	Risk Assessment	7
	2.6.2	1 Mitigated Risk	7
	2.6.2	2 Environmental Accidents	7
3	Con	clusions	. 21
	Appen	dix A – Noise Management Plan	А
	Appen	dix B – Dust and Emission Management Plan	В
	Appen	dix C – Nature and Heritage Conservation Screen	C
	Appen	dix D – Drawings	D
		FIGURES	
Fi	igure 1	Windrose, Skelmersdale	5
		TABLES	
_		TABLES	_
	able 1 able 2	Sensitive Receptor Review Odour Risk Assessment and Management Plan	6 8
	able 3	Noise and Vibration Risk Assessment and Management Plan	11

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l able 4	Dust Fugitive Emission Risk Assessment and Management Plan	14
Table 5	Mud Fugitive Emission Risk Assessment and Management Plan	17
Table 6	Accident Management Plan	20



1 Introduction

1.1 Background

This document, prepared by ByrneLooby supports a permit application (report reference K0158-BLP-R-ENV-01-01). Ravenhead Quarry is currently an active quarry, operated by Booth Ventures Waste (North West) Limited, excavating aggregate for the construction industry. This permit application proposes to infill the existing quarry void as a restoration activity. The following key documents and data sources have been consulted in the preparation of this variation application report including:

- Risk assessments for your environmental permit GOV.UK (www.gov.uk)
- Magic Map Application (defra.gov.uk)
- Online maps & routes for walking, cycling and running | OS Maps
- Google Earth
- Data Met Office
- Wind Forecast United Kingdom WillyWeather

This risk assessment has been undertaken using current Environment Agency (the Agency) guidance issued on www.gov.uk and makes reference to potential impacts on local amenity. The guidance referenced identifies the following step process to risk assessments which can be summarised as:

- Identify risks;
- Identify receptors;
- Identify possible pathways
- Assess relevant risks; and
- Control risks.

The guidance indicates that the following parameters require assessing:

- Any discharge;
- Accidents;
- Odour;
- Noise and vibration;
- Fugitive emissions; and
- Release of bioaerosols.

The guidance requires that receptors are considered with regard to the proximity of the site. Table 1, in Section 2.4 of this report identifies the most likely sensitive receptors adjacent to site and has been compiled using information available through internet-based searches.

The following separate risk assessments have been carried out as part of this variation application:

- Hydrogeological Risk Assessment (ref: K0158-BLP-R-ENV-06-01, HRA);
- Landfill Gas Risk Assessment (ref: K0158-BLP-R-ENV-07-01, GRA); and



Stability Risk Assessment (ref: K0158-BLP-R-ENV-08-01, SRA).

In view of the above, the impact of fugitive emissions to groundwater and surface water; waste mass and engineering stability; and generation of landfill gas will not be considered further by this H1 assessment.

1.2 Assessment of Environmental Risk

The Agency guidance requires that everyone applying for a new environmental permit (other than a standard permit) or variation to an existing permit should present information in the form of risk assessment tables, one table for each actual or possible hazard identified. Identification of accidents scenarios and their prevention through operational management should also be detailed. Each table should identify the hazard, the potential receptors and the pathway from the hazard to those receptors. In addition, the tables should also include the preventative risk management practices to be employed along with an assessment of the mitigated risk.

Restoration of the site will be completed as per the information contained within the Environmental Setting and Site Design (ESID) report.

2 Scope of the Assessment

2.1 Site Details and Proposed Operations

Ravenhead Quarry is located approximately 500m to the north of the M58 motorway, on the southwest boundary of Upholland, and is approximately 2.5 kilometres to the east of Skelmersdale at National Grid Reference (NGR) SD 5126 0479. Access is from the west off Chequer Lane, an alternative but currently unused alternative is off Tower Hill Road.

The site is an active quarry, operated by Booth Ventures Waste (North West) Limited, excavating aggregate for the construction industry. The quarrying operations currently occupy the southern end of the quarry, and the mineral processing operations occupy the northern end of the quarry. The whole site is part of the larger Ibstock Brick Works site, which is owned by Ibstock Brick Ltd.

The proposal is to use Qualifying Materials fill, as specified by Her Majesty's Revenue and Customs (HMRC) in The Landfill Tax (Qualifying Material) Order 2011 (as amended), to landfill the resultant void space at Ravenhead Quarry. The infilling of the void will provide final restoration contours for the site to be commensurate with the surrounding land surface (as far as is reasonably practical).

2.2 Potential Hazards

2.2.1 Odour

The wastes to be brought for disposal at the site are very unlikely to be a significant source of odour. Experience from similarly permitted installations has shown that the low or negligible organic content results in negligible landfill gas generation and no production of malodorous leachate or smell. The very limited range of wastes to be accepted effectively removes the need to produce an odour management plan. Nevertheless, the risks associated with fugitive odour emissions are detailed in Table 2 and will continue to be managed in accordance with the sites Environmental Management System (EMS).



2.2.2 Noise and Vibration

The risk of excessive noise and vibration associated with the proposed activity will be restricted primarily to movement and operation of site plant. The site is located within a semi-rural location with residential land to the southwest, west and northeast, and open land use to the east, south and southeast. The site is an active quarry, with site plant operating onsite and lorries arriving and departing through currently consented hours. It is therefore considered that the disposal/restoration operations at the site are unlikely to generate an increase in noise impact. The majority of the activity (disposal) is below ground surface (within a quarry / void) hence noise is lessened compared to above ground surface operations. A comprehensive noise survey and assessment has been undertaken as part of the twin tracked planning application.

The Site will be managed in accordance with the Noise Management Plan attached as Appendix A. A summary of the site controls is provided below:

- Activities will only take place during normal working hours and noise levels will be monitored in accordance, and will be in compliance, with the planning permission and any limits contained therein;
- All plant, equipment and machinery used in connection with the operation and maintenance of the site shall be equipped with effective silencing equipment or sound proofing equipment to the standard of design set out in the manufacturer's specification;
- All mobile plant used onsite will be fitted with and use the types of reversing alarms specified in the planning permission;
- All vehicles, plant and equipment will be maintained and operated in accordance with the manufacturer's recommendations to reduce unnecessary noise from engines or bodywork;
- Noise levels will be taken into consideration during the selection of Site equipment, with quieter models being utilised where this is practical and economically viable;
- Enforcement of Site speed limits;
- Maintain site roads in a state of good repair to reduce noise from the passage of empty vehicles;
- Engines to be switched off when not in use; and
- Deposit of material will not be undertaken from height to reduce noise / vibration.

Risks associated with noise and vibration are detailed in Table 3 and will continue to be managed in accordance with the Site's Noise Management Plan.

2.2.3 Dust

The site is currently an active quarry (with current screening and processing), the generation of dust created once landfilling progresses is considered to be similar to that currently produced within the quarry. Planning Practice Guidance (2014) is the principal document providing further guidance on the environmental impacts from mineral workings. In addition, reference has also been made to the Mineral Industry Research Organisation (MIRO) document 'Management mitigation and monitoring of nuisance dust and PM10 emissions arising from the extractive industries: an overview' dated February 2011; the 'Institute of Air Quality Management Guidance on the Assessment of Impacts of Construction on Air Quality and the Determination of Their Significance' (2013); and London



Councils/Mayor of London Best Practice Guidance for the 'Control of Dust and Emissions from Construction and Demolition' dated November 2006.

Dust is defined as all particulate matter up to 75 μ m in diameter (according to BS6069) and comprising both suspended and deposited dust in the London Councils/Mayor of London Best Practice Guidance. The deposition of the coarser dust fraction may be perceived as causing a nuisance. However, as described earlier there are no statutory limits above which deposited dust is considered a nuisance.

Dust generation, and dispersion are both dependent upon weather conditions. The most important factors are:

- precipitation, rain may suppress dust generation,
- wind direction, which determines direction of dispersion, and
- wind speed, which will affect ground level emissions by increasing the initial dilution of pollutants in the emission; it will also affect the potential for dust entrainment.

Dust generation is not expected to increase materially as the site reverts from a working quarry to a landfill. As noted above, weather conditions are the driver behind emissions, nevertheless the risks associated with dust emissions are detailed in Table 5 and will be managed in accordance with the Site's Dust Emissions Management Plan (DEMP), attached as Appendix B.

As the infilling is primarily below ground level, the landfilling at site will not significantly increase the risk of dust emissions.

2.2.4 Mud

Mud can be trailed onto the highway by vehicles leaving the site after picking up mud from unpaved roads or from the point of deposit. Access to the site will be via existing haul roads and wheel wash. A combination of the distance travelled on the internal haul roads and the wheel wash will ensure any accumulated mud will be removed prior to the vehicle leaving site. If a vehicle is observed to be particularly muddy, the driver will be redirected through the wheelwash. The primary receptor to entrained mud will be the adjoining Chequer Lane and Tower Hill Road (if provided in the future as an alternative route. The wheel wash will be maintained to ensure efficient operation and the haul roads will be maintained by road sweeper. The access roads and Chequer Lane will be regularly inspected allowing the operator to deploy additional road sweepers as necessary, as part of the landfill 'Site Management Controls'. The risks associated with entrained mud are considered in Table 5.

2.2.5 Litter

The waste types to be brought to site are Qualifying Materials, which will be primarily comprised of excavated minerals and aggregates. These are very unlikely to contain materials which could present a risk as 'wind-blown litter' and will not be considered further by this assessment.

2.2.6 Pests and Vermin

The deposit of putrescible waste in landfills may attract pests and scavengers and also provide a habitat for the breeding or loafing of pests and vermin. As the materials to be accepted for disposal are unlikely to contain anything to attract pests or vermin, the risk associated with the site is considered to be negligible and will not be considered further by this assessment.



2.2.7 Global Warming

The Gas Risk Assessment (Report K0158-BLP-R-ENV-07-01) has determined (qualitatively assessed) that negligible volumes of landfill gas will be generated by the deposited wastes. The volumes are significantly lower than the threshold at which conventional control and treatment systems can operate. Gas monitoring carried out at similar sites (accepting the same wastes as those proposed herein) indicates that the actual volume of gas produced will be lower than the surrender criteria detailed in the Environment Agency Surrender Guidance (Ref 5.02). It is therefore expected that the site will present a negligible risk in terms of global warming potential, as such this aspect will not be considered further in this assessment.

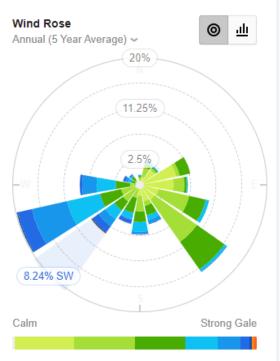
2.3 Potential Hazard Pathway

When identifying the receptors, the closest and the most sensitive (if different from the closest) have been considered in each direction from the hazard. Account has been taken of the mechanism of transport to the sensitive receptor e.g. proximity to highway access / egress points for mud and wind direction for airborne dust. Recent wind direction data has been used to establish hazard pathways to adjacent to the site.

2.3.1 Meteorological Conditions

Weather and wind statistics are taken from Skelmersdale Weather Station¹ located 2.8 km northwest of the site boundary. The windrose shows that the dominant wind direction (prevailing direction) is from the west southwest (20%) and southeast (16%) blowing towards the east northeast and northwest (Figure 1).

Figure 1 Windrose, Skelmersdale



¹ Skelmersdale Wind Forecast, Lancashire WN8 6 - WillyWeather



2.4 Probability of Exposure

Probability of exposure is determined by the distance of the receptor to the site and the likelihood of the hazard reaching the receptor i.e. frequency of prevailing wind in that direction. The probability of exposure is irrespective of the type of hazard presented.

2.5 Hazard Receptors

Table 1 identifies the most likely sensitive receptors adjacent to site, this has been compiled using information available through internet-based searches. The locations of these receptors are indicated on drawing K0158/4/001 (ESID2 and ESID3).

Table 1 Sensitive Receptor Review

Receptor No.	Receptor	Receptor Type	Approx. Distance from Site Boundary (m)	Direction from Site	Freq (%) Prevailing Wind Direction
1	Residential properties on Miners View	Residential	120	W	6.7
2	Residential properties on Broadacre	Residential	10	ENE	17.5
3	Residential properties on Vale Croft	Residential	10	NE	8.2
4	Residential properties on Fieldview	Residential	25	NNE	5.5
5	Residential properties on Ravenhead Drive	Residential	35	N	6.9
6	Residential properties on Daybrook	Residential	200	NNW	5.6
7	Residential properties on Darfield	Residential	260	NW	14.8
8	Residential properties on Danbers	Residential	340	WNW	9.8
9	Residential properties on Tower Hill Road	Residential	150	S	1.4
10	Residential properties on Galloway Drive	Residential	270	E	8.3
11	Well Cross Farm (and kennels)	Residential / Farm	200	SE	1.8
12	Highview Pre-school	School	170	E	8.3
13	Playing Field	Recreation	45	S	1.4
14	Playing Field	Recreation	300	W	6.7
15	Chequer Lane Playing Fields	Recreation	460	WNW	9.8
16	Beacon Country Park	Recreation	740	NNW	5.6
17	Hope High School	School	700	WSW	7.2
18	Moorside Primary School	School	850	WNW	9.8
19	Holland Moor Primary School	School	840	NW	14.8
20	St Thomas the Martyr CoE Primary School	School	530	NE	8.2
21	Up Holland High School	School	1240	SE	1.8
22	Ibstock Brick Works	Industry	<10	NW	14.8
23	East Pimbo Industrial Estate	Industry	570	SW	3.2
24	Best Western Lancashire Manor Hotel	Hotel	500	SW	3.2
25	Up Holland Benedictine Priory	Scheduled Monument	920	ENE	17.5
26	Upholland station	Station	870	SSW	3.3
27	Train line	Train line	800	S	1.4
28	Tower Hill Road	Road	135	SSE	0
29	Miners View	Road	150	W	6.7
30	Broadacre	Road	40	ENE	17.5
31	Vale Croft	Road	35	NE	8.2
32	Fieldview	Road	55	NNE	5.5
33	Ravenhead Drive	Road	55	N	6.9
34	Daybrook	Road	240	NW	14.6
35	Darfield	Road	300	NW	14.6
36	Danbers	Road	360	WNW	9.8
37	Chequer Lane Chequer Lane	Road	270	W	6.7

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Receptor No.	Receptor	Receptor Type	Approx. Distance from Site Boundary (m)	Direction from Site	Freq (%) Prevailing Wind Direction
38	M58 Motorway	Road	480	S	1.4
39	Public Footpath	Footpath	180	E	8.3
40	Public Footpath	Footpath	140	SW	3.2
41	Issues	Spring	590	ESE	2.8
42	Issues	Spring	960	Е	8.3
43	Issues	Spring	1050	NE	8.2
44	Issues	Spring	830	NNW	5.6
45	Unnamed Pond	Pond	700	ESE	2.4
46	Unnamed Pond	Pond	510	WNW	9.8
47	Abbey Lakes	Lakes	1200	Е	8.3
48	Dean Brook	Stream	1250	ENE	17.6
49	Unnamed drain	Drain	100	W	6.7
50	Unnamed drain	Drain	115	SSW	3.3
51	Unnamed drain	Drain	170	ESE	2.4
52	Unnamed drain	Drain	370	Е	8.3
53	Unnamed drain	Drain	670	N	6.9
54	Ravenhead Quarry geological SSSI	SSSI	0	Surrounding Site	0 - 17.5
55	Pimbo Lane Pit	LWS	60	SE	1.8
56	A577	Road	570	W	6.7

Basic preapplication advice and a 'Conservation & Heritage Screen' (referenced: EPR/LB3107GH/A001) were provided by the Agency. A copy of the Screen is provided at Appendix C. It identified Ravenhead Quarry Site of Special Scientific Interest (SSSI) located at Site. It is a geological SSSI rather than an ecological SSSI and is referenced in Table 1 above. Mitigation measures have been embedded within the design of the sites restoration to ensure the preservation of the geology of the SSSI. The Screen also identified a Local Wildlife Site (LWS) Pimbo Lane Pit within 200m of the site and this has also been included in Table 1 above.

2.6 Risk Assessment

The specific risk assessments completed for Odour, Noise, Dust Fugitive Emissions and Mud are detailed in the tables below. In many cases there is an inter-relationship between these specific risk assessments and meteorological conditions and where relevant this has been identified. The pathway is determined by the location of the receptor relative to the site, the distance from the site boundary (m) and the frequency (likelihood) the prevailing wind will blow in the direction of the receptor (%) as determined by wind rose data.

2.6.1 Mitigated Risk

The Mitigated Risk is the residual risk presented by the Hazard after control measures have been instigated.

2.6.2 Environmental Accidents

The Agency guidance requires the completion of an Accidents Risk Assessment and Management Plan. This should assess potential hazards associated with the proposed activity not described in the sections above. Potential environmental accidents attributed to gas, leachate and waste mass stability have been considered within separate risk assessments that form part of permit application.



Table 2 Odour Risk Assessment and Management Plan

Hazard / Pathway		Red	eptor		Probability	Consequence	Overall	Risk Management	Residual Risk
Pathway	No.	Dist.	Direc.	Freq.	Probability	Consequence	Risk	KISK Management	Residuat Kisk
	1	120	W	6.7		High – residential receptor	Medium		
	2	10	ENE	17.5		High – residential receptor	Medium		
	3	10	NE	8.2		High – residential receptor	Medium		
	4	25	NNE	5.5		High – residential receptor	Medium		
	5	35	N	6.9		High – residential receptor	Medium	Waste Acceptance Protocols ensure wastes	
Odour through	6	200	NNW	5.6		High – residential receptor	Medium	have low organic content and therefore negligible gas / odour potential	
the Air from:	7	260	NW	14.8		High – residential receptor	Medium	In accordance with Site's EMS procedures, the	
exposed waste and wastes as	8	340	WNW	9.8		High – residential receptor	Medium	operator will document all events or complaints received associated with odour, regardless if	
received as part of the infilling –	9	150	S	1.4	Low - Waste types very	Tigil residential receptor	the site is the likely cause or it is attributed to another source. By recording all such odour		
considered low risk based on	10	270	E	8.3	unlikely to generate	High – residential receptor	Medium	events in combination with meteorological conditions, the operator will be in a stronger position to deal with such odour issues effectively. It will be possible to identify the likely source and undertake appropriate	Low
<u>consented</u> <u>waste types</u>	11	200	SE	1.8	odours	High – agricultural / residential receptor	Medium		
waste types	12	170	Е	8.3		High – school receptor	Medium		
	13	45	S	1.4		Low – open space, transient odour annoyance	Low	remedial action if applicable. In some instances the source may be shown to be off-site and thus	
	14	300	W	6.7		Low – open space, transient odour annoyance	Low	beyond the control of the operator.	
	15	460	WNW	9.8		Low – open space, transient odour annoyance	Low		
	16	740	NNW	5.6		Low – open land, transient odour annoyance	Low		
	17	700	WSW	7.2		High – school receptor	Medium		
	18	850	WNW	9.8		High – school receptor	Medium		
	19	840	NW	14.8		High – school receptor	Medium		



	Hazard / Receptor							DIKINELO	
•		, nec	Leptoi		Probability	Consequence	Overall Risk	Risk Management	Residual Risk
Pathway	No.	Dist.	Direc.	Freq.			KISK		
	20	530	NE	8.2		High – school receptor	Medium		
	21	1240	SE	1.8		High – school receptor	Medium		
	22	<10	NW	14.8		Medium – industrial receptor	Medium		
	23	570	SW	3.2		Medium – industrial receptor	Medium		
	24	500	SW	3.2		High – hospitality receptor	Medium		
	25	920	ENE	17.5		Medium – nuisance to users	Medium		
	26	870	SSW	3.3		Medium – station, transient odour annoyance	Medium		
	27	800	S	1.4		Low – railway, transient odour annoyance	Low		
	28	135	SSE	0		Low – road, transient odour annoyance	Low		
	29	150	W	6.7		Low – open land, transient odour annoyance	Low		
	30	40	ENE	17.5		Low – road, transient odour annoyance	Low		
	31	35	NE	8.2		Low – road, transient odour annoyance	Low		
	32	55	NNE	5.5		Low – road, transient odour annoyance	Low		
	33	55	N	6.9		Low – road, transient odour annoyance	Low		
	34	240	NW	14.6		Low – road, transient odour annoyance	Low		
	35	300	NW	14.6		Low – road, transient odour annoyance	Low		
	36	360	WNW	9.8		Low – road, transient odour annoyance	Low		
	37	270	W	6.7		Low – road, transient odour annoyance	Low		
	38	480	S	1.4		Low – road, transient odour annoyance	Low		
	39	180	E	8.3		Medium – footpath, transient odour annoyance	Medium		
	40	140	SW	3.2		Medium – footpath, transient odour annoyance	Medium		



Hazard /	Receptor			_	Overall				
Pathway	No.	Dist.	Direc.	Freq.	Probability	Consequence	Risk	Risk Management	Residual Risk
	41	590	ESE	2.8		Low – spring, not sensitive to odour	Low		
	42	960	E	8.3		Low – spring, not sensitive to odour	Low		
	43	1050	NE	8.2		Low – spring, not sensitive to odour	Low		
	44	830	NNW	5.6		Low – spring, not sensitive to odour	Low		
	45	700	ESE	2.4		Low – pond, not sensitive to odour	Low		
	46	510	WNW	9.8		Low – pond, not sensitive to odour	Low		
	47	1200	Е	8.3		Low – lake, not sensitive to odour	Low		
	48	1250	ENE	17.6		Low – stream, not sensitive to odour	Low		
	49	100	W	6.7		Low – drain, not sensitive to odour	Low		
	50	115	SSW	3.3		Low – drain, not sensitive to odour	Low		
	51	170	ESE	2.4		Low – drain, not sensitive to odour	Low		
	52	370	Е	8.3		Low – drain, not sensitive to odour	Low		
	53	670	N	6.9		Low – drain, not sensitive to odour	Low		
	54	0	Surrounding Site	0 - 17.5		Low – open land, transient odour annoyance	Low		
	55	60	SE	1.8		Low – open land, transient odour annoyance	Low		
	56	570	W	6.7		Low – road, transient odour annoyance	Low		



Table 3 Noise and Vibration Risk Assessment and Management Plan

Hazard /		Red	ceptor		Probability	Consequence	Overall	Risk Management	Residual
Pathway	No.	Dist.	Direc.	Freq.	,		Risk		Risk
	1	120	W	6.7	High – close proximity to Site	High – nuisance to residents	High		
	2	10	ENE	17.5	High – close proximity to Site	High – nuisance to residents	High	Most site activities will be below. Landfilling	
	3	10	NE	8.2	High – close proximity to Site	High – nuisance to residents	High	activities are unlikely to generate noise in excess of the previous quarrying activities.	
	4	25	NNE	5.5	High – close proximity to Site	High – nuisance to residents	High	On site speed limits will be enforced and	
Noise through	5	35	N	6.9	High – close proximity to Site	High – nuisance to residents	High	internal site roads will be maintained to minimise noise / vibration.	
air and	6	200	NNW	5.6	High – close proximity to Site	High – nuisance to residents	High	Appropriate maintenance of site vehicles in	
Vibration through	7	260	NW	14.8	High – close proximity to Site	High – nuisance to residents	High	accordance with the manufacturer's or supplier's instructions Where practicable, engines to be switched off when not in use. Silencers will be used on vehicles. Should it prove necessary alternatives to reversing bleepers on site vehicles will also be	
ground from:	8	340	WNW	9.8	High – close proximity to Site	High – nuisance to residents	High		
Vehicle Movements	9	150	S	1.4	High – close proximity to Site	High – nuisance to residents	High		
associated with the delivering	10	270	E	8.3	High – close proximity to Site	High – nuisance to residents	High		Low
and handling of waste on site.	11	200	SE	1.8	High – close proximity to Site	High – agricultural / residential receptor	High		
Site plant.	12	170	E	8.3	High – close proximity to Site	High – nuisance to students	High	considered.	
one plane.	13	45	S	1.4	High – close proximity to Site	Medium – nuisance to users to open spaces	Medium	Tipping will not be made from height to reduce noise / vibration.	
	14	300	W	6.7	High – close proximity to Site	Medium – nuisance to users to open spaces	Medium	Operational hours will adhere to planning	
	15	460	WNW	9.8	High – close proximity to Site	Medium – nuisance to users to open spaces	Medium	conditions.	
	16	740	NNW	5.6	Medium – proximity to Site	Medium – nuisance to users to open spaces	Medium	Planning conditions which set noise limits for the operations will be adhered to at all	
	17	700	WSW	7.2	Medium – proximity to Site	High – nuisance to students	Medium	times.	
	18	850	WNW	9.8	Medium – proximity to Site	High – nuisance to students	Medium		
	19	840	NW	14.8	Medium – proximity to Site	High – nuisance to students	Medium		



Hazard /		Red	eptor				Overall	DIKINLLOO	Residua
Pathway	No.	Dist.	Direc.	Freq.	Probability	Consequence	Risk	Risk Management	Risk
	20	530	NE	8.2	Medium – proximity to Site	High – nuisance to students	Medium		
	21	1240	SE	1.8	Low - distance from site	High – nuisance to students	Medium		
	22	<10	NW	14.8	High – close proximity to site	Medium – industrial receptor	Medium		
	23	570	SW	3.2	Medium – proximity to Site	Medium – industrial receptor	Medium		
	24	500	SW	3.2	Medium – proximity to Site	High – hospitality receptor	Medium		
	25	920	ENE	17.5	Medium – proximity to Site	Medium – nuisance to users	Medium		
	26	870	SSW	3.3	Medium – proximity to Site	Medium – station, transient nuisance	Medium		
	27	800	S	1.4	Medium – proximity to Site	Low – railway, transient nuisance	Low		
	28	135	SSE	0	Medium – distance from site	Low – road, transient nuisance	Low		
	29	150	W	6.7	High – close proximity to site	Low – road, transient nuisance	Low		
	30	40	ENE	17.5	High – close proximity to site	Low – road, transient nuisance	Low		
	31	35	NE	8.2	High – close proximity to site	Low – road, transient nuisance	Low		
	32	55	NNE	5.5	High – close proximity to site	Low – road, transient nuisance	Low		
	33	55	N	6.9	High – close proximity to site	Low – road, transient nuisance	Low		
	34	240	NW	14.6	High – close proximity to site	Low – road, transient nuisance	Low		
	35	300	NW	14.6	High – close proximity to site	Low – road, transient nuisance	Low		
	36	360	WNW	9.8	High – close proximity to site	Low – road, transient nuisance	Low		
	37	270	W	6.7	High – close proximity to site	Low – road, transient nuisance	Low		
	38	480	S	1.4	High – close proximity to site	Low – road, transient nuisance	Low		
	39	180	E	8.3	High – close proximity to site	Medium – footpath, transient nuisance	Medium		
	40	140	SW	3.2	High – close proximity to site	Medium – footpath, transient nuisance	Medium		



Hazard /		Red	ceptor		Probability	Consequence	Overall	Risk Management	Residual
Pathway	No.	Dist.	Direc.	Freq.		Consequence	Risk	Not Hanagement	Risk
	41	590	ESE	2.8	Medium – proximity to Site	Low – spring, not sensitive to odour	Low		
	42	960	E	8.3	Medium – proximity to Site	Low – spring, not sensitive to odour	Low		
	43	1050	NE	8.2	Low - distance from site	Low – spring, not sensitive to odour	Low		
	44	830	NNW	5.6	Medium – proximity to Site	Low – spring, not sensitive to odour	Low		
	45	700	ESE	2.4	Medium – proximity to Site	Low – pond, not sensitive to odour	Low		
	46	510	WNW	9.8	Medium – proximity to Site	Low – pond, not sensitive to odour	Low		
	47	1200	E	8.3	Low - distance from site	Low – lake, not sensitive to odour	Low		
	48	1250	ENE	17.6	Low - distance from site	Low – stream, not sensitive to odour	Low		
	49	100	W	6.7	High – close proximity to site	Low – drain, not sensitive to odour	Low		
	50	115	SSW	3.3	High – close proximity to site	Low – drain, not sensitive to odour	Low		
	51	170	ESE	2.4	High – close proximity to site	Low – drain, not sensitive to odour	Low		
	52	370	Е	8.3	High – close proximity to site	Low – drain, not sensitive to odour	Low		
	53	670	N	6.9	Medium – proximity to Site	Low – drain, not sensitive to odour	Low		
	54	0	Surrounding Site	0 - 17.5	High – close proximity to site	Medium – open land, transient nuisance	Medium		
	55	60	SE	1.8	High – close proximity to site	Medium - potential to disturb wildlife	Medium		
	56	570	W	6.7	Medium – proximity to Site	Low – road, transient nuisance	Low		



Table 4 Dust Fugitive Emission Risk Assessment and Management Plan

Hazard /		Red	ceptor		Probability	Consequence	Overall	Risk Management	Residual	
Pathway	No.	Dist.	Direc.	Freq			Risk		Risk	
	1	120	W	6.7	High – close proximity to Site, occasionally downwind	High – residential receptor	High	No excessively dusty wastes to be accepted at the site.		
	2	10	ENE	17.5	High – close proximity to Site, frequently downwind	High – residential receptor	High	Infilling is predominantly below		
	3	10	NE	8.2	High – close proximity to Site, occasionally downwind	High – residential receptor	High	ground surface, which further mitigates against emissions On site vehicle speed limit enforced to ensure that vehicle movements do not generate excessive dust.		
-	4	25	NNE	5.5	High – close proximity to Site, infrequently downwind	High – residential receptor	High			
	5	35	N	6.9	High – close proximity to Site, occasionally downwind	High – residential receptor	High			
	6	200	NNW	5.6	High – close proximity to Site, infrequently downwind	High – residential receptor	High			
	7 260 NW 14.8 High – close proxim	High – close proximity to Site, frequently downwind	High – residential receptor	High	Dampening of site					
Dust	8	340	WNW	9.8	High – close proximity to Site, occasionally downwind	High – residential receptor	High	roads/surfaces as necessary using a tanker during dry periods. Weighbridge will conduct assessment of waste inputs and impose controls and restriction on potentially dusty waste (e.g. rapid cover following placement, refusal to tip).		
through air from:	9	150	S	1.4	High – close proximity to Site, infrequently downwind	High – residential receptor	High		· ·	
vehicle movements	10	270	E	8.3	High – close proximity to Site, , occasionally downwind	High – residential receptor	High		Low	
or deposit of wastes	11	200	SE	1.8	High – close proximity to Site, infrequently downwind	High – residential receptor	High			
wastes	12	170	E	8.3	High – close proximity to Site, occasionally downwind	High – school receptor	High			
	13	45	S	1.4	High – close proximity to Site, infrequently downwind	Medium – open space, dust nuisance	Medium			
	14	300	W	6.7	High – close proximity to Site, occasionally downwind	Medium – open space, dust nuisance	Medium	Daily visual inspection by appropriate site staff at		
	15	460	WNW	9.8	High – close proximity to Site, occasionally downwind	Medium – open space, dust nuisance	Medium	suitable locations taking account of the prevailing wind		
	16	740	NNW	5.6	Medium – proximity to Site, infrequently downwind	Medium – open space, dust nuisance	Medium	direction.		
	17	700	WSW	7.2	Medium – proximity to Site, occasionally downwind	High – school receptor	Medium	All vehicles will use wheel wash to prevent mud / dust being trailed onto adjacent roads and		
	18	850	WNW	9.8	Medium – proximity to Site, occasionally downwind	High – school receptor	Medium			
	19	840	NW	14.8	Medium – proximity to Site, frequently downwind	High – school receptor	Medium	creating a hazard / nuisance.		
	20	530	NE	8.2	Medium – proximity to Site, , occasionally downwind	High – school receptor	Medium	A road sweeper will regularly clean site roads of any mud		



Hazard /		Receptor Probability Consequence Overall Rice			Risk Management	Residua			
Pathway	No.	Dist.	Direc.	Freq			Risk		Risk
	21	1240	SE	1.8	Low - distance from site, infrequently downwind	High – school receptor	Medium	trailed on from site vehicles, this will limit further dust	
	22	<10	NW	14.8	High – close proximity to sit, frequently downwind	Medium – industrial receptor	Medium	generation.	
	23	570	SW	3.2	Medium – proximity to Site, infrequently downwind	Medium – industrial receptor	Medium		
	24	500	SW	3.2	Medium – proximity to Site, infrequently downwind	High – hospitality receptor	Medium		
	25	920	ENE	17.5	Medium – proximity to Site, frequently downwind	Medium – dust nuisance to users	Medium		
	26	870	SSW	3.3	Medium – proximity to Site, infrequently downwind	High – station, transient dust nuisance	Medium		
	27	800	S	1.4	Medium – proximity to Site, infrequently downwind	Low – railway, transient dust nuisance	Medium		
	28	135	SSE	0	Medium – distance from site, infrequently downwind Low – roa	Low – road, transient dust nuisance	Medium		
	29	150	W	6.7	High – close proximity to site, occasionally downwind	Low – road, transient dust nuisance	Medium		
	30	40	ENE	17.5	High – close proximity to site, frequently downwind	Low – road, transient dust nuisance	Medium		
	31	35	NE	8.2	High – close proximity to site, occasionally downwind	Low – road, transient dust nuisance	Medium		
	32	55	NNE	5.5	High – close proximity to site, infrequently downwind	Low – road, transient dust nuisance	Medium		
	33	55	N	6.9	High – close proximity to site, occasionally downwind	Low – road, transient dust nuisance	Medium		
	34	240	NW	14.6	High – close proximity to site, frequently downwind	Low – road, transient dust nuisance	Medium		
	35	300	NW	14.6	High – close proximity to site, frequently downwind	Low – road, transient dust nuisance	Medium		
	36	360	WNW	9.8	High – close proximity to site, occasionally downwind	Low – road, transient dust nuisance	Medium		
	37	270	W	6.7	High – close proximity to site, occasionally downwind	Low – road, transient dust nuisance	Medium		
	38	480	S	1.4	High – close proximity to site, infrequently downwind	Low – road, transient dust nuisance	Medium		
	39	180	Е	8.3	High – close proximity to site, occasionally downwind	Medium - footpath, transient nuisance	Medium	1	
	40	140	SW	3.2	High – close proximity to site	Medium - footpath, transient nuisance	Medium		
	41	590	ESE	2.8	Medium – proximity to Site	Medium – potential sediment accumulation	Medium		



Hazard /		Red	ceptor		Probability	Consequence	Overall	Pick Management	Residual
Pathway	No.	Dist.	Direc.	Freq		consequence	Risk	ugement	Risk
	42	960	E	8.3	Medium – proximity to Site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	43	1050	NE	8.2	Low - distance from site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	44	830	NNW	5.6	Medium – proximity to Site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	45	700	ESE	2.4	Medium – proximity to Site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	46 510 WNW 9.8		9.8	Medium – proximity to Site, occasionally downwind	Medium – potential sediment accumulation	Medium			
	47	1200	E	8.3	Low - distance from site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	48	1250	ENE	17.6	Low - distance from site, frequently downwind	Medium – potential sediment accumulation	Medium		
	49	100	W	6.7	High – close proximity to site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	50	115	SSW	3.3	High – close proximity to site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	51	170	ESE	2.4	High – close proximity to site, infrequently downwind	Medium – potential sediment accumulation	Medium		
	52	370	Е	8.3	High – close proximity to site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	53	670	N	6.9	Medium – proximity to Site, occasionally downwind	Medium – potential sediment accumulation	Medium		
	54	0	Surrounding Site	0 - 17.5	High – close proximity to site, frequently downwind	Medium – dust nuisance to users	Medium		
	55	60	SE	1.8	High – close proximity to site, infrequently downwind	Medium – potential deposition on sensitive vegetation	Medium		
	56	570	W	6.7	Medium – proximity to Site, occasionally downwind	Low – road, transient dust nuisance	Medium		



Table 5 Mud Fugitive Emission Risk Assessment and Management Plan

Hazard and		Re	ceptor		Probability	Consequence	Overall	Risk Management	Overall
Pathway	No.	Dist.	Direc.	Freq	Trobability	Consequence	Risk	Nisk munugement	Risk
	1	120	W	6.7	High – connects to Chequer Lane High - potential hazardous road conditions		High	All vehicles will use wheel	
	2	10	ENE	17.5	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	wash to prevent mud / dust being trailed onto	
	3	10	NE	8.2	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	adjacent roads and	
	4	25	NNE	5.5	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	creating a hazard / nuisance.	
	5	35	N	6.9	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	Site staff at the	
	6	200	NNW	5.6	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	weighbridge and at the tipping face will be	
	7	260	NW	14.8	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	vigilant to excessive mud tracked from the site by	
Mud tracked	8	340	WNW	9.8	High – connects to Chequer Lane	High - potential hazardous road conditions	High	visiting vehicles and site plant. Any vehicles	
from site	9	150	S	1.4	High – connects to Chequer Lane	High - potential hazardous road conditions	High	observed to be carrying mud in their tyres will be	
onto public roads by	10	270	E	8.3	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium	directed back through the wheelwash until the	Low
associated site	11	200	SE	1.8	High – connects to Chequer Lane	High - potential hazardous road conditions	High	wheels are clean before	
vehicles	12	170	Е	8.3	High – connects to Chequer Lane	High - potential hazardous road conditions	High	 leaving site. A road sweeper will regularly clean the site haul roads and the adjacent shared access 	
	13	45	S	1.4	Low - no physical connection	Field not at risk from mud entrainment on road	Low		
	14	300	W	6.7	Low - no physical connection	Field not at risk from mud entrainment on road	Low		
	15	460	WNW	9.8	Low - no physical connection	Field not at risk from mud entrainment on road	Low	and public highway as necessary.	
	16	740	NNW	5.6	Low - no physical connection	Field not at risk from mud entrainment on road	Low	Drivers will be reminded	
	17	700	WSW	7.2	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium	of their responsibility to maintain clean vehicles	
	18	850	WNW	9.8	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium	and not to track mud onto the public highway.	
	19	840	NW	14.8	Low – significant distance by road to receptor	High - potential hazardous road conditions	Medium		



Hazard and		Re	ceptor		Probability	Consequence	Overall	Risk Management	Overall
Pathway	No.	Dist.	Direc.	Freq	Probability	Consequence	Risk	KISK Mallagement	Risk
	20	530	NE	8.2	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium	Monitoring of shared access and appropriate	
	21	1240	SE	1.8	Low - no physical connection	High - potential hazardous road conditions	Low	maintenance will form	
	22	<10	NW	14.8	High – connects to Chequer Lane	High - potential hazardous road conditions	High	site.	
	23	570	SW	3.2	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	24	500	SW	3.2	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	25	920	ENE	17.5	Low - significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	26	870	SSW	3.3	Low - no physical connection	Station not at risk from mud entrainment on road	Low		
	27	800	S	1.4	Low - no physical connection	Railway not at risk from mud entrainment on road	Low		
	28	135	SSE	0	High – connects to Chequer Lane	High - potential hazardous road conditions	High		
	29	150	W	6.7	High – connects to Chequer Lane	High - potential hazardous road conditions	High		
	30	40	ENE	17.5	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	31	35	NE	8.2	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	32	55	NNE	5.5	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	33	55	N	6.9	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium		
	34	240	NW	14.6	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium]	
	35	300	NW	14.6	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium]	
	36	360	WNW	9.8	High – connects to Chequer Lane	High - potential hazardous road conditions	High	1	
	37	270	W	6.7	High – Chequer Lane	High - potential hazardous road conditions	High	1	
	38	480	S	1.4	Medium – significant distance by road to receptor	High - potential hazardous road conditions	Medium	1	
	39	180	E	8.3	Low - no physical connection	Footpath not at risk from mud entrainment on road	Low		



Hazard		Re	ceptor			DIKINLLOODI			
and Pathway	No.	Dist.	Direc.	Freq	Probability	Probability Consequence		verall Risk Management	Overall Risk
Patriway	NO.	Dist.	Direc.	rieq					
	40	140	SW	3.2	Low - no physical connection	Footpath not at risk from mud entrainment on road	Low		
	41	590	ESE	2.8	Low - no physical connection	Spring not at risk from mud entrainment on road	Low	_	
	42	960	E	8.3	Low - no physical connection	Spring not at risk from mud entrainment on road	Low	-	
	43	1050	NE	8.2	Low - no physical connection	Spring not at risk from mud entrainment on road	Low		
	44	830	NNW	5.6	Low - no physical connection	Spring not at risk from mud entrainment on road	Low		
	45	700	ESE	2.4	Low - no physical connection	Pond not at risk from mud entrainment on road	Low		
	46	510	WNW	9.8	Low - no physical connection	Pond not at risk from mud entrainment on road	Low		
	47	1200	E	8.3	Low - no physical connection	Lake not at risk from mud entrainment on road	Low		
	48	1250	ENE	17.6	Low - no physical connection	Stream not at risk from mud entrainment on road	Low	-	
	49	100	W	6.7	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	50	115	SSW	3.3	Low - no physical connection	Drain not at risk from mud entrainment on road	Low		
	51	170	ESE	2.4	Low - no physical connection	Drain not at risk from mud entrainment on road	Low	-	
	52	370	E	8.3	Low - no physical connection	Drain not at risk from mud entrainment on road	Low	-	
	53	670	N	6.9	Low - no physical connection	Drain not at risk from mud entrainment on road	Low	-	
	54	0	Surrou nding Site	0 - 17.5	Low - no physical connection	SSSI not at risk from mud entrainment on road	Low		
	55	60	SE	1.8	Low - no physical connection	LWS not at risk from mud entrainment on road	Low	1	
	56	570	W	6.7	High – connects to Chequer Lane	High - potential hazardous road conditions	High		



Table 6 Accident Management Plan

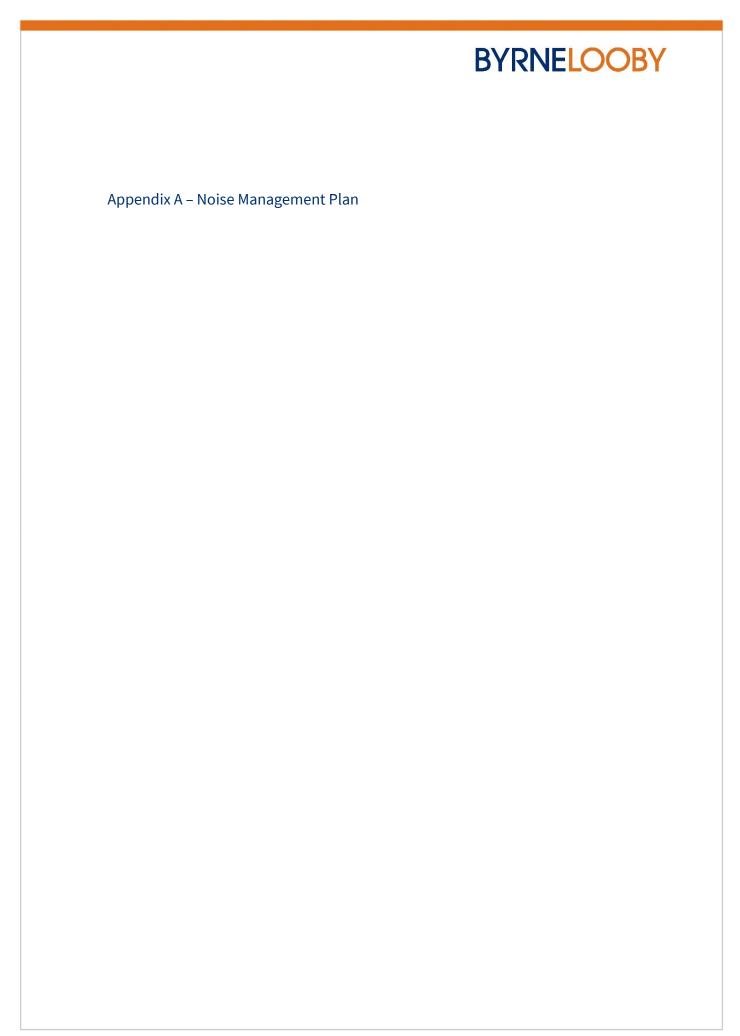
Hazard	Receptor	Pathway	Probability	Consequence	Overall Risk	Risk Management	Mitigated Risk
Fuel / engine oil Leak or damage to portable	Groundwater	Base of excavation	Low	High - pollution of groundwater	Medium	Fuel and engine oils stored away from proposed landfill with appropriate secondary containment and spillage contingencies;	
fuel bowser, static fuel storage tank or site vehicles	Surface Water	Lateral	Low	High - pollution of surface water	Medium	Site vehicles will not be refuelled within landfill area; Site vehicles and plant subject to regular preventative maintenance in accordance with EMS procedures.	Low
Fire Uncontrolled burning of residual wastes or site	Groundwater	Base of excavation	Low	High - pollution of groundwater through firewater run-off or leaks from damaged equipment	Medium	Wastes to be accepted at site will effectively be inert, have a low organic content and inherently non-combustible in nature, or through production of landfill gas; Site vehicles and plant subject to regular preventative maintenance in	Low
vehicles.	Receptors listed in Table 2 above	Airborne	Low	Medium - smoke / odour annoyance	Medium	line with site EMS procedures; Fire control equipment will be on hand, with major incidents to be dealt with by the Fire Brigade in accordance with site EMS Procedures.	
Explosion Compressed gas cylinders,	Site staff	Airborne	Low	High - danger of serious injury	Medium	Fuel is stored in separate installation with appropriate controls to prevent fire or explosion (i.e. no smoking on site); Compressed gases not required and therefore present for operation of	Low
combustion of landfill gas or fuel storage tank	Groundwater	Base of excavation	Low	High - pollution of groundwater through leaks from damaged equipment	Medium	Site. Low organic content of waste will generate negligible volumes of landfill gas and will not present an explosion risk.	
Wastes deposited Chemical reaction of incompatible wastes	Receptors listed in Table 2 above	Airborne	Low	Medium - odour annoyance or smoke from oxidising agents	Medium	Waste acceptance protocols will exclude the deposit of chemically reactive wastes. Those accepted will be of an inert/non-hazardous nature and will not generate noxious gases or contaminating leachate.	Low
Vandalism Damage to site vehicles, fuel	Groundwater	Base of excavation	Low	High - pollution of groundwater through leaks from damaged equipment	Medium	Site security will prevent access by unauthorised persons. Vehicles will be kept overnight in a secure area with appropriate security measures;	Low
bowsers, gas or leachate extraction pipework	Receptors listed in Table 2 above	Airborne	Low	Medium - odour annoyance	Medium	Wastes not expected to require exposed active gas or leachate control infrastructure which could be subject to damage.	
Leachate Accidental damage to leachate monitoring chamber	Groundwater	Base of excavation	Low	High - pollution of groundwater through leaks from damaged well	Medium	Wastes not expected to require active gas or leachate control infrastructure which could be exposed to damage; CQA supervision will prevent damage to basal drainage pipework with the deposit of waste.	Low



3 Conclusions

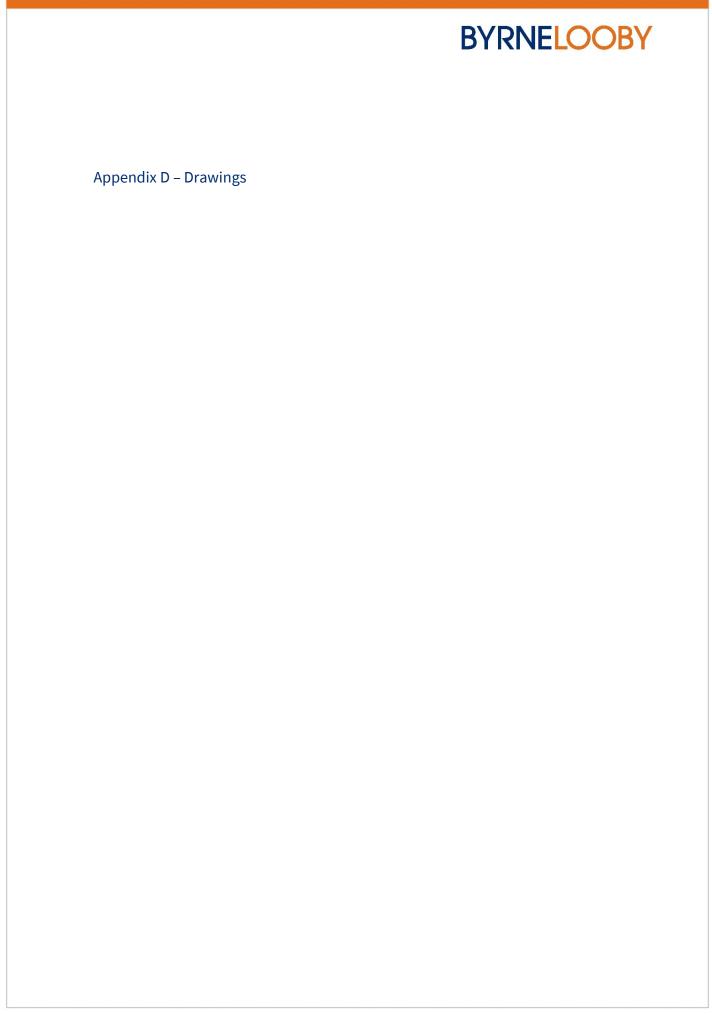
The operational hazards associated with the proposal have been considered in the tables below, these hazards relate to heath and amenity. It has been concluded that, where necessary, with the use of appropriate mitigating management controls the Site will not present a significant risk to surrounding receptors.

By way of further mitigation, a Dust Emissions Management Plan and Noise Management Plan have been prepared for the application and are attached as Appendix A and B.









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