



HORSE HILL
DEVELOPMENTS LTD

Horse Hill Developments Ltd

Title: Environmental Risk Assessment

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 HORSE HILL DEVELOPMENTS LTD	HORSE HILL DEVELOPMENTS LTD	HHDL-EPR-HHP-ERA-007	
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1. INTRODUCTION

Horse Hill Developments LTD (HHDL) is a Limited Company that was formed to manage the exploration and production activities at the Horse Hill Well Site. HHDL is a consortium of natural resource companies and owns a 65% interest and operatorship of Petroleum Exploration and Development Licence (PEDL) 137 within which the Horse Hill well site is located.

In accordance with the Environmental Permitting (England and Wales) Regulations 2016 HHDL have prepared an application to vary its environmental permits. The purpose of the permit variation is to:

- Consider changes to waste streams and quantities from additional drilling operations and production operations;
- Vary the current standard rules permit for the storage of crude oil to a bespoke permit following the proposed expansion of the site boundary, whereby the conditions of the standard rules permit can no longer be met.
- Add an additional two (2) outlets to the water discharge activity. One for reinjection (groundwater activity) and one for surface water discharge.

Following the advice from the Environment Agency an additional application will also be submitted for the operation of specified generators for the production of electricity for export. This Waste Management Plan does not consider this activity.

The proposed activities for the well site include:

- 1) Construction of five new drilling cellars and the construction of a new plateau east of the existing well site.
- 2) Drilling of four new hydrocarbon wells (HH-1/1Z and HH 2 wells will be retained for production), making a total of six production wells and one new produced water re-injection well within the existing well site.
- 3) The Installation of oil processing, storage and tanker loading facilities to enable the export of oil from the well site with maintenance workovers and sidetrack drilling (if necessary).
- 4) The removal of all surface production equipment followed by the plugging and abandonment of the six production wells and one produced water re-injection borehole.
- 5) The removal and disposal of all surface bunding and stone surfacing followed by the regrading of the soils and subsequent aftercare monitoring.

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2. SCOPE

This Environmental Risk Assessment is applicable to the Horse Hill Well Site and all operations conducted therein. It has been produced to present and outline the assessment of the environmental risks for the Horse Hill Well Site during the proposed drilling operations, production operations, well maintenance operations, well abandonment operations and well site restoration operations.

It is applicable to HHDL, its contractor and subcontractors and can be used in support of an application to the Environment Agency under the Environmental Permitting (England and Wales) Regulations 2016 (EPR2016), where there is a requirement to provide an Environmental Risk Assessment. This Environmental Risk Assessment has been carried out in accordance with the [Environment Agency Guidance](#).

3. DEFINITIONS

ID:	Identification number the hazard has been given to allow for easy referencing.
Source:	A source of pollutants from the activity taking place such as flaring. (Source can also be referred to as 'hazard').
Receptor:	Although the likelihood of pollution is low it may have an adverse effect on surrounding residents, wildlife and habitats; these are known as the pollutants receptors.
Pathway:	The pathway the pollutant is taking such as air or unsaturated zones.
Risk Management:	Mitigation measures that will be put in place to control the risks so far as reasonably practicable.
Probability of Exposure:	The chance of the hazard occurring taking into account mitigation measures.
Consequence:	A result of an event or action that has occurred.
Overall Risk:	A hazard that has been assessed and has been given a risk rating level post mitigation measures i.e. not significant, low, medium, high very high etc.
Not Significant:	The severity of risk together with the likelihood of the risk is not expected to cause harm to the environment.
Low:	The severity of risk together with the likelihood of the risk has low potential for causing harm to the environment.
Medium:	The severity of risk together with the likelihood of the risk has a moderate potential for causing harm to the environment.
High:	The severity of risk together with the likelihood of the risk has a high potential for causing harm to the environment.
PEDL:	Petroleum Exploration and Development Licence.

Table 3.1: Definitions

4. METHODOLOGY

The structure of the Environmental Risk Assessment is consistent with the Environment Agency guidance using a source pathway receptor model and includes:

- Identifying the risk from the site;
- Assessing risks and checking they are acceptable;
- Justifying appropriate measures to control the risk (if needed); and
- Presenting the risk assessment.

The Environmental Risk Assessment has included the following items, which have been reviewed for applicability within the proposed operations:

- | | |
|----------------------------|---------------------|
| • Accidents & Incidents | • Light |
| • Air Emissions | • Noise |
| • Dust | • Odour |
| • Fugitive Emission | • Releases to Water |
| • Global Warming Potential | • Waste |

This Environmental Risk Assessment is based on a qualitative assessment and details the activities and events that may lead to environmental impact on one or more receptors.

4.1 Scoring Criteria

In order to establish a risk rating for each **Source-Pathway-Receptor** (S-P-R) linkage both the Likelihood (**Probability of Exposure**) and Consequence have been issued a score. The score is used in conjunction with Table 4.3 to provide an overall risk rating of the activity. All scores and risk ratings are provided on the basis that the mitigation measure are in place.

Likelihood	Descriptor
Very Low	Rarely encountered, never reported or highly unlikely.
Low	Infrequent Occurrences.
Medium	Can be expected to occur several times per year.
High	Repeated Occurrences.

Table 4.1: Scoring System - Likelihood

Consequence	Descriptor
Very Low	Slight environmental effect that does not exceed a regulatory standard.
Low	Minor environmental effect which may breach a regulatory standard but is localised to the point of release with no significant impact on the environment or human health.
Medium	Moderate, localised effect on people and the environment in the vicinity of the incident.
High	A major environmental incident resulting in significant damage to the environment and harm to human health.

Table 4.2: Scoring System - Consequence

The risk matrix presented in Table 4.3 below derives a risk rating for each S-P-R linkage identified within this Environmental Risk Assessment.

Risk Rating		Consequence			
		Very Low	Low	Medium	High
Likelihood	Very Low	Not Significant	Not Significant	Low	Low
	Low	Not Significant	Low	Medium	Medium
	Medium	Low	Medium	Medium	High
	High	Low	Medium	High	High

Table 4.3: Risk Matrix

Environmental risks are assigned a Not Significant, Low, Medium or High risk rating and coded using a colour coded system. A description of each risk rating is presented in Table 4.4 below.

Risk Rating	Acceptable?	Descriptor
Not Significant	Acceptable	Near-certain that an incident will not occur. If it did occur the consequences would not be significant.
Low	Acceptable	Unlikely an incident will occur or give rise to anything more than a minor consequence on the immediate area.
Medium	Tolerable	The activity can only take place provided that any impacts remain localised and risk remediation is readily available.
High	Unacceptable	The risk must be further reduced before the activity can commence.

Table 4.4: Risk Rating Definitions

4.2 Local Receptors

Site selection, in particular the separation distance between the site and sensitive receptors, is an important factor when considering oil and gas operations and their potential impact upon the surrounding environment.

Receptors are classed in to the following categories:

- Low – Footpath or road;
- Medium – Industrial or commercial workplaces; and
- High (sensitive) – Housing, pubs, hotels etc.

Receptor Type	Search Radius	Name	Distance from Site	Direction from Site	Grid Reference	Name	Distance from Site	Direction from Site	Grid Reference
RAMSAR	10km	N/A							
Special Areas of Conservation (SAC)	10km	Mole Gap to Reigate Escarpment	8.00 km	North	TQ 25011 51693				
Special Protection Areas (SPA)	10km	N/A							
Marine Protection Areas (MPA)	10km	N/A							
Sites of Special Scientific Interest (SSSI)	2km	N/A							
Scheduled Ancient Monuments	2km	N/A							
National Nature Reserves	2km	N/A							
Local Nature Reserves	2km	Edolphs Copse	1.69 km	Southwest	TQ 23909 42410				
Local Wildlife Sites	2km	N/A							
Sensitive Receptors: Households / Businesses	2km	Five Acres	0.20 km	East	TQ 25577 43493	Sunny Acres Farm	1.20 km	Northeast	TQ 26059 44653
		Wrays Farm House	0.21 km	East	TQ 25610 43624	Farmfield	1.20 km	Southeast	TQ 25788 42431
		High Trees	0.28 km	Northeast	TQ 25404 43948	Unnamed Dwellings	1.25 km	Southeast	TQ 26564 43110
		Wrays Farm	0.31 km	East	TQ 25708 43528	Sidlow Manor	1.25 km	North	TQ 25525 44898
		Rushmeads Cottage	0.35 km	Southeast	TQ 25604 43287	Norwood Hill Orchards	1.28 km	Southwest	TQ 23909 43282
		Lomond	0.35 km	Southeast	TQ 25727 43456	Nuthurst Farm	1.29 km	Northeast	TQ 26001 44794
		Rushmeads	0.42 km	Southeast	TQ 25708 43294	Duxhurst Farm	1.31 km	North	TQ 25479 44941
		Wrayswood	0.42 km	North	TQ 25234 44087	Duxhurst Cottages	1.32 km	North	TQ 25197 44980
		Phoenix Lodge	0.46 km	Northwest	TQ 24838 43967	Rose Cottage Farm	1.34 km	Northwest	TQ 23934 44139
		Oakwood	0.48 km	North	TQ 25135 44137	Moat Farm	1.34 km	Northeast	TQ 26348 44596
		Horse Hills Farm	0.52 km	North	TQ 25127 44175	Clifton Cottage Farm	1.35 km	Northwest	TQ 23842 43846
		Rowgardens Wood	0.55 km	Northwest	TQ 24654 43804	Edolph Lodge	1.37 km	Southwest	TQ 24490 42334
		Wrays	0.58 km	Northeast	TQ 25781 44204	Hookwood Manor	1.38 km	Southeast	TQ 26538 42807
		Collendean Farm	0.58 km	Northwest	TQ 24671 43935	Nutley Dean Business Park	1.41 km	Northwest	TQ 24164 44635
		Brittleware Farm	0.60 km	Southwest	TQ 24629 43274	Edolphs	1.42 km	Southwest	TQ 24345 42370
		Ferriers Grange	0.62 km	East	TQ 26021 43549	Edolphs Farm	1.43 km	Southwest	TQ 24270 42422
		Lincoln Lodge	0.64 km	North	TQ 25235 44302	Hookwood	1.45 km	Southeast	TQ 26586 42720
		Greenstead Hall Farm	0.68 km	Southwest	TQ 24671 43067	Hookwood Lodge	1.45 km	Southeast	TQ 26695 42927
		Rowgarth	0.70 km	West	TQ 24489 43707	Ridgewood Stud	1.45 km	North	TQ 25016 45106
		Witherow Farm	0.72 km	North	TQ 25419 44380	Crutchfield Cottages	1.48 km	Northeast	TQ 26113 44950
		Crutchfield Farm	0.72 km	Northeast	TQ 25928 44137	Spartan Green Farm	1.49 km	Southwest	TQ 23737 43138
		Woodlands Farm	0.72 km	East	TQ 26107 43744	Cams Farm	1.50 km	Southeast	TQ 26391 42447
		Oaklodge	0.73 km	East	TQ 26119 43663	Chantersluer Lodge	1.51 km	Northwest	TQ 23706 43993
		Khan Yunus	0.77 km	Northeast	TQ 26052 44049	Horley	1.53 km	East	TQ 26923 43581
		Derrinabrin Farm	0.78 km	Southwest	TQ 24558 43048	Horseshoe Farm	1.56 km	Northeast	TQ 26145 45023
		Oakside	0.82 km	East	TQ 26211 43517	Duxhurst	1.57 km	Northeast	TQ 25802 45179
		Ferriers Forge	0.86 km	Southeast	TQ 26124 43311	Whitegates	1.58 km	Southeast	TQ 26859 42920
		The Lodge	0.86 km	East	TQ 26256 43525	Edolph Cottages	1.63 km	Southwest	TQ 24410 42095
		Crutchfield Brae	0.89 km	Northeast	TQ 25672 44505	Little Chantersluer	1.66 km	Southwest	TQ 23572 44031
		The Croft	0.89 km	Northeast	TQ 26188 44032	Cherry Tree Farm	1.69 km	Northwest	TQ 23603 44232
		PW	0.90 km	Northeast	TQ 26262 43883	Wolvers Home Farm	1.69 km	North	TQ 25056 45353
		Oakleigh	0.93 km	Northeast	TQ 26213 44110	Willowdene	1.69 km	Southeast	TQ 26932 42869
		Roundwood Lodge	0.97 km	North	TQ 25270 44635	Landens Farm	1.70 km	Northeast	TQ 26947 44322
		Nursery	0.99 km	Northeast	TQ 26067 44378	Lower Duxhurst Farm	1.73 km	Northeast	TQ 26107 45240
		The Morgans	0.99 km	Southwest	TQ 24221 43248	Ridgefield House	1.74 km	Southwest	TQ 23615 42767
		Wayside Manor	1.00 km	West	TQ 24173 43500	Chantersluer Farm	1.77 km	Northwest	TQ 23435 43878
		Telephone Exchange	1.00 km	West	TQ 24185 43337	Ricketts Wood	1.77 km	Southwest	TQ 23460 43069
		Spencers	1.01 km	North	TQ 25022 42529	Depot	1.77 km	Southeast	TQ 26332 42063
		Recycling Site	1.02 km	Northeast	TQ 25960 44510	Drummond House	1.78 km	Southwest	TQ 23472 42993
		Hopps House	1.05 km	East	TQ 26446 43718	Little Mynthurst Farm	1.80 km	Northwest	TQ 23650 44586
		Roundwood	1.06 km	North	TQ 25278 44721	Little Deeping Farm	1.81 km	Southeast	TQ 26188 41938
		Westlands Farm	1.06 km	Southeast	TQ 26332 43076	Wolvers	1.84 km	North	TQ 24918 45483
Fairlawn	1.08 km	Northeast	TQ 26359 44119	Povey Cross Farm	1.84 km	Southeast	TQ 26692 42275		
Hookwood House	1.10 km	Southeast	TQ 26427 43279	Little Landens	1.86 km	Northeast	TQ 27133 44278		
The Dell	1.11 km	Northeast	TQ 26229 44386	Charwood Place	1.87 km	Southwest	TQ 24357 41848		
Gatwick Business Park	1.13 km	Southeast	TQ 26218 42791	Deanoak Brook	1.90 km	Northwest	TQ 23719 44792		
Thackery	1.14 km	Northeast	TQ 26211 44450	Ricketts Wood Cottages	1.91 km	Southwest	TQ 23384 42859		
Clyvan	1.16 km	Northeast	TQ 26345 44304	Norwood Place Farm	1.94 km	Northwest	TQ 23435 44495		
Delcot	1.16 km	Northeast	TQ 26335 44331	Unnamed Dwellings	1.95 km	Northwest	TQ 24442 45461		
Norwood Hill	1.16 km	West	TQ 24016 43507	Longfield House	1.97 km	West	TQ 23216 43317		
Duxhurst Farm House	1.17 km	North	TQ 25246 44832	Little Burfolds	1.98 km	Southwest	TQ 23361 42736		
Water Features	2km	River Mole	1.40 km	East	TQ 26688 43644				

Table 4.5: Receptor Details

ASSESSMENT OF ODOUR RISK

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Breaking containment on tanks and pipework carrying produced fluids.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Tanks and pipework to be inspected for leaks as required by written procedures. Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned / purged where possible prior to breaking containment. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Low Breaking containment of tanks / pipework will be kept to a minimum – at end of operations or essential maintenance work only.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
002	Produced fluids on the external surface of drilling pipe / equipment.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Drilling pipework / equipment to be cleaned / purged where possible prior to pulling out of hole. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Low Odorous emissions may be released from drilling pipework / equipment at surface after contact with produced fluids from within the wellbore.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
003	Incineration of natural gas. • Specified Generators; • Flare Unit	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Flare and Specified generators to be agreed by Environment Agency to ensure compliance prior to use. Flare and Specified generators to be built according to manufacturer's and industry standards. Equipment to be tested for leaks prior to delivery / use as required by manufacturer / written procedures. Flare equipment to be cleaned / purged where possible prior to breaking containment. Monitoring of flare combustion temperature to be undertaken during periods of flaring. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Low Odorous emissions are present when combustion of gases occurs. Odorous emissions may be released during flaring of natural gas.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
004	Sour gas.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	The presence of H ₂ S was not observed during the drilling of the HH-1 well and is therefore not anticipated to be encountered during drilling of the additional boreholes. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Very Low H ₂ S not expected	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant Not expected

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
005	Storage / use / transfer and decanting of odorous products during operations.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Odorous products to be substituted for odourless products where reasonably practicable. Quantities of odorous chemicals / oils are to be kept to a minimum where possible. Damaged / leaking containers are to be segregated and used as a priority where possible. Chemicals / oils are to be segregated / stored correctly and sealed / closed when not in use. Spillage pads / containers are to be used to ensure any spillages are contained and can be remediated effectively and efficiently.</p> <p>Containers are to be checked on delivery / prior to use / periodically for signs of damage or leaks.</p> <p>During transfer / decanting of odorous chemicals / oils the following procedures are to be undertaken:</p> <ul style="list-style-type: none"> • Containers are to be sealed when not in use and will to be checked periodically for damage and leaks; • Spillage pads / containers are to be used to ensure any spillages are contained and can be remediated effectively and efficiently; • Avoid direct sunlight where possible; and • Reduce evaporation rate by eliminating air flow and surface area. <p>Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.</p>	Very Low Odorous emissions may be released during transfer / decanting of chemicals / oils.	Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
006	Storage of raw materials.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Use of raw materials that are less likely to cause odour problems.</p> <p>Quantity of materials to be planned to ensure that orders of biodegradable materials will be limited and excess quantities kept to a minimum.</p> <p>Materials to be managed, stored and handled correctly by competent personnel.</p> <p>Regular inspections of materials / storage area to identify potential problems that may cause odorous emissions.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.</p>	Very Low Odorous emissions may be released from decaying materials. Raw materials used during the operation will be kept to a minimum.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
007	Containment failure. (e.g. over pressure of vessels and pipework).	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Pipework and valves installed to above maximum theoretical working pressure. Integrity testing of tanks and pipework to be undertaken as required by manufacturer / written procedures.</p> <p>Pressure system checks to be undertaken as required by manufacturer / written procedures. Equipment / pipework to be tested prior to operational use.</p> <p>Regular maintenance and inspections are to be conducted as directed by written procedures.</p> <p>Competent trained personnel only to operate plant or equipment.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Operation / task to be planned and communicated.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.</p>	Very Low Odorous emissions may be released but emergency procedures will minimise the potential for odorous emissions.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
008	Site sewage tanks.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Tanks to be self-contained / enclosed to prevent emissions. Tanks and pipework to be inspected for leaks prior to use to ensure complete integrity. Tanks to be clearly marked to ensure that waste is kept segregated and cross contamination does not occur. Tanks to be monitored daily and emptied as required. Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned / purged where possible prior to breaking containment. Plug / cap tanks, pipes, hoses etc. after breaking containment. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Very Low Odorous emissions may be released during breaking containment of the tanks / pipework but will be kept to a minimum – during waste transfer operations, at end of operations or essential maintenance work only. Septic tank pump-out will cause vent to atmosphere from suction tanker for short durations (<30mins). This is a temporary low velocity and low volume emission.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
009	Site waste skips.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Where possible, skips to be self-contained / enclosed to prevent emissions. Skips to be clearly marked to ensure that waste is kept segregated and cross contamination does not occur. Skips to be monitored and emptied daily / as required. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Very Low Odorous emissions may be released from breakdown of refuse in skips if left over a period of time. Skips will be monitored and emptied frequently to remove the possibility of odorous emissions occurring.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
010	Onsite power generation.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Equipment to be built according to manufacturer's and industry standards. Equipment to be inspected for leaks prior to delivery / use as required by manufacturer / written procedures. Equipment to be cleaned / purged where possible prior to breaking containment. Breaking containment of equipment is to be kept to a minimum. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Very Low Odorous emissions are present when combustion of gases occurs. Odorous emissions may be released during operation of combustion engines used within onsite power generation.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.
011	Onsite spillage.	Air – Prevailing winds from south west (average statistics from the Met Office).	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Spillages to be remediated as soon as reasonably practicable. Containers are to be sealed when not in use. Containers are to be checked prior to use / periodically for signs of damage or leaks. Damaged / leaking containers are to be segregated and used as a priority where possible. Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter. Spillage pads / containers are to be used during transfer of chemicals etc. to ensure any spillages are contained and can be remediated effectively and efficiently. Used spillage equipment to be segregated and contained to prevent release of odour prior to offsite disposal. Training on environmental awareness and emergency procedures for site personnel during site induction. Records will be kept of complaints and action taken to resolve complaints if required. An Odour Management Plan is to be in place, distributed and adhered to by site personnel.	Very Low Odorous emissions may be released from spillage occurring during the exploratory operations. Emergency procedures and onsite training will minimise the potential for odorous emissions.	Very Low Complaints of odours / smells in vicinity of local receptors.	Not significant If managed correctly.

ASSESSMENT OF NOISE AND VIBRATION RISKS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Transportation vehicles accessing and egressing site. Vehicle engines and generators on site. Vehicle reversing alarms. Loading and unloading of vehicles.	Atmosphere and ground vibrations.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Noise limits set by the planning authority shall not be breached. Transport restrictions set by the planning authority shall not be breached. Noise monitoring to be conducted if required. Sound screens to be erected if required. Directional / white noise reversing alarms are to be fitted to site vehicles if required. Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections. Loading / unloading operations will be planned where possible during day light hours. Trained operators to load / unload vehicles using MHE plant equipment. Equipment when not in use to be switched off. Records will be kept of complaints and action taken to resolve complaints if required.	Low Vehicle movements will be limited in compliance with planning authority conditions. Noise and vibration may occasionally reach local inhabitants.	Very Low Complaints of noise in vicinity of local receptors.	Not significant If managed correctly.
002	Noise from the proposed operations including noise levels from: <ul style="list-style-type: none"> drilling rig; site plant equipment; generators; and movement of equipment around site. Vibration from drilling operations and site vehicles.	Atmosphere and ground vibrations.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Noise limits set by the planning authority shall not be breached. Sound screens to be erected if required from sound survey results. Directional / white noise reversing alarms are to be fitted to site vehicles if required. Vehicles / equipment are to be serviced and maintained to manufacturer's / industry standards. Loading / unloading operations will be planned where possible during day light hours. Trained operators to load / unload vehicles using MHE plant equipment. Equipment when not in use to be switched off. Records will be kept of complaints and action taken to resolve complaints if required.	Low Noise and vibration may occasionally reach local inhabitants.	Very Low Complaints of noise in vicinity of local receptors.	Not significant If managed correctly.
003	Noise from flaring operations.	Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Flare unit to be constructed and tested in accordance with manufacturer's / industry standards. Noise output of flare unit known, and fed into noise assessment submitted with Planning Application Flare unit to be monitored and controlled at all times. Gas rates to the flare can be reduced if required. Perimeter safe zone established around flare unit. Regular maintenance and inspections of flare equipment conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required.	Low During flaring operations noise may be produced from the flaring of gases. Noise generated will depend on the volume of subsurface gases released from the formation and controlled through the plant.	Very Low Complaints of noise in vicinity of local receptors.	Not significant If managed correctly.

ASSESSMENT OF GROUNDWATER RISKS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Produced Hydrocarbons from the formation.	Loss of well integrity leading to leakage.	Groundwater bearing formations not including the producing formation.	<p>The borehole is constructed to industry standards / best available techniques and reviewed by an independent well examiner.</p> <p>Adequate mud weight / suspension fluid weight, well control equipment and procedures in place.</p> <p>Competent Site Supervisor who holds a certified in date well control certificate is to be present during operations.</p> <p>Use of competent drilling fluids / suspension fluids management personnel.</p> <p>Cementing best practices utilised.</p> <p>A Hydrogeological Risk Assessment has been conducted by a specialist hydrogeologist.</p>	Very Low Management actions and procedures should prevent this happening.	Low Minor pollution event	Not significant If managed correctly.
002	Acid Wash	Introduced to the formation via perforations.	Groundwater bearing formations not including the producing formation.	<p>The borehole is constructed to industry standards / best available techniques and reviewed by an independent well examiner.</p> <p>Competent Site Supervisor who holds a certified in date well control certificate is to be present during operations.</p> <p>A Hydrogeological Risk Assessment has been conducted by a specialist hydrogeologist.</p> <p>Acid will be introduced to targeted formations only which may be the formation at a volume considered de minimis and in a dilute solution, 15%. Once the acid reacts with the formation it becomes a spent (neutralised) resulting in salt, water and carbon dioxide.</p> <p>In the event a target formation has groundwater present it will be considered permanently unsuitable, not least to the presence of hydrocarbons.</p>	Very Low Management actions and procedures should prevent this happening.	Low Slight pollution occurrence which would be restricted by well control	Not significant If managed correctly
003	Spillages from the surface	Percolation to the near surface groundwater.	Groundwater bearing formations.	<p>Site constructed with an impermeable liner at a slight decline to ensure rainwater and any pollutants are stored within containment ditches.</p> <p>The impermeable membrane has been the subject of integrity tests during construction.</p> <p>Large volumes of hazardous materials are to be stored within secondary containment bunds.</p> <p>Arrangements are made for the water within the sump to be discharged to surface water / groundwater or a road haulage tanker for subsequent offsite disposal via a licenced waste facility during periods of operations, which may include permitted reinjection wells.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p>	Very Low Management actions and procedures should prevent this happening.	Low Impact is unlikely to exceed the site boundary.	Not significant If managed correctly

ASSESSMENT OF FUGITIVE EMISSIONS RISKS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Emissions to Air. Methane emissions from the wellbore and mud circulation.	Air – vapours carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	The wellbore is constructed to industry standards / best available techniques and reviewed by independent well examiner. Adequate mud weight / suspension fluid weight, well control equipment and procedures in place. Competent Site Supervisor who holds a certified in date well control certificate is to be present during operations. Use of competent drilling fluids / suspension fluids management personnel. Cementing best practices utilised. Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel. Gas detection units are provided at site for early detection of methane. Notification to the emergency services and the local Fire and Rescue service will adopt a major accident plan. Training on environmental awareness and emergency procedures for site personnel during site induction. Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter. Records will be kept of complaints and action taken to resolve complaints if required.	Very Low Methane emissions from the circulation system are monitored constantly and when detected, on site procedures should prevent the release of methane.	Low Emissions should disperse prior to reaching local receptors.	Not significant If managed correctly
002	Emissions to Air. Dust and mud generated by vehicles accessing / egressing and traversing the site.	Air – vapours carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Operations to be planned / designed to minimise transport and handling operations. Vehicles inspected prior to egress from the site to manage and control mud deposits / dust suppression from vehicles egressing the site. Vehicles are to drive on approved roads and follow site traffic management system. Roads to / from the site are monitored for mud deposits. A road sweeping contractor will be arranged for road cleaning if required. Avoid certain activities that may present dust if high winds occur. Daily monitoring of wind / weather forecasts. Planting of grass, trees or hydro-seeding to assist in the suppression of dust generated from site bunds and open areas. Records will be kept of complaints and action taken to resolve complaints if required.	Very Low Management actions and site procedures should prevent this happening.	Low Nuisance – dust on cars, clothing, properties etc. Nuisance – mud on local highway.	Not significant If managed correctly
003	Emissions to Air. VOC's from vehicles and site equipment exhaust systems.	Air – vapours carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections. Vehicles are to be serviced and maintained to manufacturer's / industry standards. Regular maintenance and inspections are to be conducted as directed by written procedures. Equipment when not in use to be switched off. Training on environmental awareness and emergency procedures for site personnel during site induction. Records will be kept of complaints and action taken to resolve complaints if required.	High Emissions from vehicles and site equipment exhaust systems will occur throughout the operation.	Very Low Dispersion will occur prior to reaching receptors.	Low If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
004	Emissions to Air. VOC's from tanks / pipework.	Air – vapours carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Tanks and pipework to be inspected for leaks as required by written procedures. Storage tank system linked to single co-joined vent line to one emission point. Breaking containment of tanks and pipework systems is to be kept to a minimum. Tanks and pipework to be cleaned / purged where possible prior to breaking containment. Adequate and suitable spillage kits to be available on site / transport vehicles. Training on environmental awareness and emergency procedures for site personnel during site induction. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required.	Low Emissions may be released during breaking containment of the tanks / pipework.	Low Complaints of odours / smells in vicinity of local receptors.	Low If managed correctly
005	Emissions to Air. Fume emissions from chemicals used during operations.	Air – vapours carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Chemicals to be stored correctly on site and containers sealed / closed when not in use. Competent personnel only to store / use chemicals. Adequate and suitable spillage kits to be available on site / transport vehicles. Training on environmental awareness and emergency procedures for site personnel during site induction. Regular maintenance and inspections are to be conducted as directed by written procedures. Records will be kept of complaints and action taken to resolve complaints if required.	Low Emissions from chemicals will be minor and infrequent.	Low Complaints of odours / smells in vicinity of local receptors.	Low If managed correctly
006	Litter. Litter generated on site.	Air – litter carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Litter fences to be erected around site. Provide adequate suitable refuse receptacles for both inside and outside working areas. Litter to be cleared at end of each day / shift. Skips to be monitored and removed / emptied when required by authorised contractor. Site housekeeping inspection process implemented. Training on environmental awareness for site personnel during site induction. Records will be kept of complaints and action taken to resolve complaints if required.	Very Low Management actions and site procedures should prevent this happening.	Very Low Nuisance – Litter from site may be blown to local receptors.	Not significant If managed correctly
007	Emissions to Water. Run off from site operations.	Flow by gravity.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch. Checks of the impermeable membrane conducted periodically to ensure that complete containment of the site is maintained. Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required. Water from surface run off is collected in the site perimeter ditch and can be used in site operations or tested for contamination prior to being removed from site for onward disposal to an authorised licenced facility, which may include permitted reinjection wells by an authorised licenced waste carrier. Records will be kept of complaints and action taken to resolve complaints if required.	Very Low Unchecked, ditches could overflow and run-off could reach localised receptors but management actions should prevent this from happening.	Very Low Pollution of local surface or groundwater.	Not significant If managed correctly
008	Emissions to Water. Unauthorised discharge / failure of equipment from site water treatment system.	Flow by gravity.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Surface Water Management Plan is to be in place prior to installation of water treatment system. Authorised, trained and competent personnel only to undertake discharge to surface water operations. Access to water treatment system and flow valves will be restricted to authorised personnel only. Water treatment system and flow valves will be secured when not in use. Water treatment system maintenance program to be conducted in accordance with manufacturers guidelines.	Very Low Management actions and site procedures should prevent this happening.	Low Pollution of local surface or groundwater.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
009	<p>Pests – Insects and animals that may include but not limited to:</p> <p>Flies from refuse accumulated on site.</p> <p>Rats / mice from surrounding area.</p> <p>Wasps accumulating around materials used during operations.</p>	Air / ground transportation.	<p>Special Areas of Conservation</p> <p>Local Nature Reserves</p> <p>Sensitive Receptors</p> <p>Water Features</p> <p>Surrounding Environment</p>	<p>Refuse to be stored in enclosed skips / receptacles.</p> <p>Skips and refuse receptacles to be checked daily to ensure integrity.</p> <p>Refuse to be monitored and removed when skips are full.</p> <p>Food waste to be stored separately in enclosed skips and removed off site for disposal as required.</p> <p>Sacks / containers to be monitored for leaks / spills. Identification of split sacks / damaged containers to be addressed immediately and contents repackaged / or used as a prioritised item.</p> <p>Litter to be cleared at end of each day / shift.</p> <p>Pest control techniques to be established and implemented by competent contract company, if required.</p> <p>Daily monitoring of susceptible areas by Site Supervisor.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	<p>Very Low</p> <p>Wastes left unattended could result in problems off site.</p> <p>Sacks / containers damaged through handling / use can result in accumulation of pests and problems off site.</p>	<p>Low</p> <p>Potential for spreading of disease and adverse health impacts on vulnerable people.</p>	<p>Not significant</p> <p>If managed correctly</p>

ASSESSMENT OF VISIBLE PLUME RISKS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Emissions to Air. Plume emissions from flaring operation.	Dispersion by wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Flare equipment to be agreed by Environment Agency to ensure.</p> <p>Flare unit designed, constructed and built to industry standards / best available techniques (BAT).</p> <p>Flare equipment to be inspected for leaks prior to delivery / use as required by manufacturer / written procedures.</p> <p>Flare unit and pipework to be operated and maintained to industry standards.</p> <p>Flare unit and associated pipework to be tested for leaks prior to operational use.</p> <p>Monitoring of flare combustion temperature to be undertaken during periods of flaring.</p> <p>Monitoring procedures established to include monitoring of the gas entering the flare.</p> <p>Good 3-phase separation upstream of flare to remove and prevent liquid carryover.</p> <p>Procedures established and communicated to operational personnel should the flow rate of gas exceed or fall below the flares flow range.</p> <p>Regular maintenance and inspections are to be conducted as directed by written procedures.</p> <p>An Air Quality Impact Assessment has been undertaken prior to commencement of flaring operations.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Potential for visible plume emissions particularly during initial start-up of the flare.	Very Low Nuisance – reduced / low visibility.	Not significant If managed correctly

ASSESSMENT OF POSSIBLE SOURCES OF ACCIDENTS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Accidents resulting from operations carried out without a structured management system in place.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Structured management system in place, distributed and adhered to by personnel involved in operations.	Very Low Management actions and procedures should prevent this happening.	Very Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly
002	Plant or equipment failure.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch. Where required, rathole and mousehole have been installed and have been grouted in place to ensure integrity of the site. Site / vehicle spillage kits to be readily available. Spillages to be remediated as soon as reasonably practicable. Regular maintenance and inspections are to be conducted as directed by written procedures. Safety critical spares readily available. Competent trained personnel only to operate plant or equipment. Training on environmental awareness and emergency procedures for site personnel during site induction. Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter. Records will be kept of complaints and action taken to resolve complaints if required.	Very Low Management actions and site procedures should prevent this happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly
003	Poor storage arrangements of hazardous substances.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch. Hazardous substances to be stored in dedicated areas. COSHH Assessments in place for hazardous items. Personnel trained in safe handling / use of hazardous items (COSHH Awareness etc.). COSHH items to be segregated in line with current regulations. Material Safety Data Sheets (MSDS) to be readily available for each hazardous item. Training on environmental awareness and emergency procedures for site personnel during site induction. Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter. Records will be kept of complaints and action taken to resolve complaints if required.	Very Low Management actions and procedures should prevent this happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
004	Transferring substances. (e.g. loading or unloading vessels).	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Storage tanks installed within constructed bunded area.</p> <p>Personnel trained in safe handling / use of hazardous items (COSHH Awareness etc.).</p> <p>Transferring of substances is to be monitored by site personnel.</p> <p>Drip trays to be utilised.</p> <p>Site / vehicle spillage kits to be readily available.</p> <p>Spillage pads / containers are to be used during transfer of chemicals etc. to ensure any spillages are contained and can be remediated effectively and efficiently.</p> <p>Spillages to be remediated as soon as reasonably practicable.</p> <p>Trained operators to carry out loading / unloading operations.</p> <p>Specific areas identified for loading / unloading operations.</p> <p>Operation / task to be planned and communicated to site personnel.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Unchecked, ditches could overflow and run-off could reach localised receptors but management actions should prevent this from happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly
005	Incompatible substances coming into contact.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Where required, rathole and mousehole have been installed and have been grouted in place to ensure integrity of the site.</p> <p>Segregation of incompatible substances.</p> <p>Hazardous substances to be stored appropriately on site in accordance with current regulations.</p> <p>COSHH Assessments in place for hazardous items.</p> <p>Personnel trained in safe handling / use of hazardous items (COSHH Awareness etc.).</p> <p>COSHH items to be segregated in line with current regulations.</p> <p>Material Safety Data Sheets (MSDS) to be readily available for each hazardous item.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures should prevent this happening.	Very Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
006	Overfilling vessels.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Storage tanks installed within constructed bunded area.</p> <p>Integrity testing of tanks and pipework to be undertaken as required by manufacturer / written procedures.</p> <p>Testing of systems as part of operating procedures.</p> <p>Transferring of substances is to be monitored by site personnel.</p> <p>Site spillage kits to be readily available.</p> <p>Spillages to be remediated as soon as reasonably practicable.</p> <p>Trained operators to carry out filling operations.</p> <p>Specific areas identified for filling operations.</p> <p>Operation / task to be planned and communicated.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Authorised personnel only to be in working area.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Unchecked, ditches could overflow and run-off could reach localised receptors but management actions and bunding should prevent this from happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly
007	Unwanted reactions and/or runaway reactions.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Emergency shutdown procedures to be established and tested prior to and during operations.</p> <p>Competent trained personnel to conduct operations.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Operation / task to be planned and communicated.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures, with use of QA and applicable standards will prevent this happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
008	Containment failure. (e.g. over pressure of vessels and pipework).	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Checks of the impermeable membrane conducted periodically to ensure that complete containment of the active area of the site is maintained.</p> <p>Storage tanks installed within constructed bunded area.</p> <p>Site spillage kits to be readily available.</p> <p>Spillages to be remediated as soon as reasonably practicable.</p> <p>Pipework and valves installed to above maximum theoretical working pressure.</p> <p>Management by pressure sensors and ESD's</p> <p>Integrity testing of tanks and pipework to be undertaken as required by manufacturer / written procedures.</p> <p>Pressure system checks conducted as required by manufacturer / written procedures.</p> <p>Equipment / pipework to be tested prior to operational use.</p> <p>Regular maintenance and inspections are to be conducted as directed by written procedures.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Operation / task to be planned and communicated.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures should prevent this happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly
009	Flooding.	Flow by gravity.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>The site is situated in a Flood Risk Area, Flood Zone 1 (very low probability of flooding). A flood risk assessment has been undertaken.</p> <p>The construction of the site has been undertaken with consideration of a 1-100 year storm event.</p>	Very Low Site Location should prevent this happening	Medium Potential for impact to exceed the site boundary.	Low If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
010	Fires or failure to contain fire water.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Fire risk assessment to be conducted.</p> <p>Fire awareness training / site induction for personnel, plus Site Rules.</p> <p>Waste management and housekeeping procedures established and communicated.</p> <p>No sources of ignition are allowed on working pad of the site unless authorised and permit to work is in place.</p> <p>Hazardous materials stored appropriately.</p> <p>Smoking area is established outside of the working pad.</p> <p>Fire points, extinguishers and a fire water tank located around the site.</p> <p>Fire trained personnel to be available throughout the operation.</p> <p>Fire evacuation and test to be conducted prior to and during operations.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Local Fire & Rescue Service to be notified of operations. A review / visit of the site may be undertaken by the Fire & Rescue Service and emergency response plans and actions discussed and agreed.</p> <p>Containment of fire water / AFFF foam used in the event of firefighting measures will be contained within the site / perimeter ditch and removed by specialised contractor.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency telephone number located on information board at site entrance.</p> <p>The site is situated in a Flood Risk Area, Flood Zone 1 (very low probability of flooding). A flood risk assessment has been undertaken.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures should prevent this happening.	Medium Pollution of local surface or groundwater. Emissions to air.	Low If managed correctly
011	Emission of an effluent before adequately checking its composition.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Competent trained personnel to conduct operations.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Operation / task to be planned and communicated.</p> <p>Substance to be tested prior to removal from site or at licenced waste facility by competent trained personnel.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures will prevent this happening.	Very Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
012	Vandalism.	<p>Various – acts of vandalism may cause fires, loss of containment from containers, damage to site equipment, etc.</p> <p>Flow by gravity.</p> <p>Air – vapours and plumes carried on the wind.</p>	<p>Special Areas of Conservation</p> <p>Local Nature Reserves</p> <p>Sensitive Receptors</p> <p>Water Features</p> <p>Surrounding Environment</p>	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Checks of the impermeable membrane conducted periodically to ensure that complete containment of the active area of the site is maintained.</p> <p>Site Security Risk Assessment to be conducted prior to operations commencing.</p> <p>Security fence to be established around site perimeter.</p> <p>Security officers from specialist security company to be contracted to provide 24-hour security during operations.</p> <p>CCTV installed onsite.</p> <p>Security procedures established and communicated to Site Security Officers to cover unauthorised access, vandalism, protestors, theft, emergency response actions etc.</p> <p>Site alarm system will include linkage to security response team.</p> <p>Site personnel to be aware of possible unauthorised personnel on site and the actions to take if such personnel discovered.</p> <p>When not in use, equipment is to be shut down and isolated.</p> <p>Hazardous materials are to be stored in locked COSHH store, if applicable, when not in use.</p> <p>Emergency communications to be established between operational personnel and site security.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p>	<p>Very Low</p> <p>Management actions and procedures should prevent this happening.</p>	<p>Low</p> <p>Pollution of local surface or groundwater.</p> <p>Emissions to air.</p>	<p>Not significant</p> <p>If managed correctly</p>
013	Spillage from haulage vehicles and plant equipment.	<p>Flow by gravity.</p> <p>Air – vapours and plumes carried on the wind.</p>	<p>Special Areas of Conservation</p> <p>Local Nature Reserves</p> <p>Sensitive Receptors</p> <p>Water Features</p> <p>Surrounding Environment</p>	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Vehicles to be serviced and maintained to manufacturer's / industry standards.</p> <p>Regular maintenance and inspections are to be conducted as directed by written procedures.</p> <p>Drivers are to receive site rules.</p> <p>Drip trays to be utilised.</p> <p>Site / vehicle spillage kits to be readily available.</p> <p>Spillages to be remediated as soon as reasonably practicable.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	<p>Very Low</p> <p>Management actions and procedures should prevent this happening.</p>	<p>Low</p> <p>Pollution of local surface or groundwater.</p> <p>Emissions to air.</p>	<p>Not significant</p> <p>If managed correctly</p>

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
014	Leaks from vehicle fluids resulting from vehicle accidents.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Vehicles to be serviced and maintained to manufacturer's / industry standards.</p> <p>Regular maintenance and inspections to be conducted as directed by the manufacturer / written procedures.</p> <p>Drivers are to receive training / induction on driving techniques and site rules</p> <p>Drip trays to be utilised.</p> <p>Site / vehicle spillage kits to be readily available.</p> <p>Spillages to be remediated as soon as reasonably practicable.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Personnel to receive site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures should prevent this happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly
015	Making the wrong connection in drains or other systems.	Flow by gravity. Air – vapours and plumes carried on the wind.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>Competent trained personnel only to connect pipework, equipment, engineering systems.</p> <p>Safe working procedures / toolbox talks conducted prior to operations commencing, documented and widely known by site personnel.</p> <p>Equipment / pipework to be tested prior to commencement of operations.</p> <p>Authorised personnel only to be in working area.</p> <p>Operation / task to be planned and communicated to all personnel involved in the operation.</p> <p>Permit to Work System to be utilised for work associated with pressure systems, work deemed high risk.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Emergency response plan both on and off site established / tested prior to commencement of operations and on a regular basis thereafter.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Management actions and procedures should prevent this happening.	Low Pollution of local surface or groundwater. Emissions to air.	Not significant If managed correctly

ASSESSMENT OF DISCHARGES TO SURFACE WATER

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Overflow of site perimeter ditches.	Flow by gravity.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Site constructed with an impermeable membrane over the whole of the active area and under the site perimeter ditch.</p> <p>A Construction Quality Management Plan is in place, distributed and adhered to by site personnel.</p> <p>Checks of the impermeable membrane conducted periodically to ensure that complete containment of the active area of the site is maintained.</p> <p>Where required, rathole and mousehole have been installed and have been grouted in place to ensure integrity of the site.</p> <p>Damming points are identified to prevent migration should overflow occur.</p> <p>Site perimeter ditch monitored and procedures in place to test and remove excess surface run off water as required.</p> <p>Water produced and/or used within the activity is re-used where possible within the operation for well control, cementing operations, and exploratory operations.</p> <p>Waste water is contained within the site boundary via storage tanks.</p> <p>Liner condition (where exposed to sunlight) is regularly inspected.</p> <p>Training on environmental awareness and emergency procedures for site personnel during site induction.</p> <p>Records will be kept of complaints and action taken to resolve complaints if required.</p>	Very Low Low – management controls and monitoring will prevent overspill.	Very Low Pollution of surface water, groundwater and / or contamination.	Not significant If managed correctly
002	Unauthorised discharge / failure of equipment from site water treatment system.	Flow by gravity.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Surface Water Management Plan is to be in place prior to installation of water treatment system.</p> <p>Authorised, trained and competent personnel only to undertake discharge to surface water operations.</p> <p>Access to water treatment system and flow valves will be restricted to authorised personnel only.</p> <p>Water treatment system and flow valves will be secured when not in use.</p> <p>Water treatment system maintenance program to be conducted in accordance with manufacturers guidelines.</p>	Very Low Management actions and site procedures should prevent this happening.	Low Pollution of local surface or groundwater.	Not significant If managed correctly

ASSESSMENT OF AIR EMISSIONS RISKS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Greenhouse gas emissions from site power generation.	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Power generation is provided by drilling rig generators and / or standalone generators. Generators are powered / operated on gas oil supplied from external banded fuel tanks or from electricity produced onsite by Gas Power Engines operations.</p> <p>During exploratory operations, the generators are usually operated 24 hours per day, thus ensuring power supply is not interrupted and the safety systems required on site ensure that the integrity and safety of the wellbore is maintained.</p> <p>Generators are maintained and serviced in line with manufacturer’s guidelines thus ensuring that they operate efficiently and minimising emissions, noise and vibration.</p> <p>Service and maintenance regimes are implemented and adhered to and all work is carried out by a competent trained electrician / mechanic.</p> <p>Generators supplied within the rig structure respond to power demand and the working load and output varies during the operations being conducted.</p> <p>When power is not required generators are switched off to reduce emissions, fuel usage, noise, vibration and wear and tear on the equipment.</p> <p>An Air Quality Impact Assessment has been undertaken and has determined that:</p> <ul style="list-style-type: none"> At the neighbouring residential locations, where frequent and long term human exposure might be expected, all pollutant process contributions were considered insignificant based on Environment Agency assessment criteria and unlikely to threaten ambient air quality standard attainment. At the sites sensitive to nitrogen and acid deposition (Edolph’s Copse LNR and Mole Gap to Reigate Escarpment SAC) maximum process contributions are considered to be insignificant based on Environment Agency assessment criteria and considered unlikely to pose any threat to, or have any substantial influence on, the attainment of critical levels and critical loads. 	<p>Very Low</p> <p>Air quality not significantly affected.</p> <p>Make regular observations over the period of operation.</p>	<p>Very Low</p> <p>Impact on global warming but deemed not significant.</p>	<p>Not significant</p> <p>If managed correctly</p>
002	Greenhouse gas emissions from flaring of natural gas during production operations.	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>In the event that natural gas is encountered during exploratory operations, it will be flowed to surface through the wellbore into fluid separation equipment, from which the petroleum is separated from produced fluids (formation water).</p> <p>Once separated, the gas is diverted via pipework to a flare unit for incineration to reduce Greenhouse gasses.</p> <p>An Air Quality Impact Assessment has been undertaken and has determined that:</p> <ul style="list-style-type: none"> At the neighbouring residential locations, where frequent and long term human exposure might be expected, all pollutant process contributions were considered insignificant based on Environment Agency assessment criteria and unlikely to threaten ambient air quality standard attainment. At the sites sensitive to nitrogen and acid deposition (Edolph’s Copse LNR and Mole Gap to Reigate Escarpment SAC) maximum process contributions are considered to be insignificant based on Environment Agency assessment criteria and considered unlikely to pose any threat to, or have any substantial influence on, the attainment of critical levels and critical loads. 	<p>Very Low</p> <p>Air quality not significantly affected from modelling assessment.</p> <p>Make regular observations over the period of operation.</p>	<p>Very Low</p> <p>Impact on global warming but deemed not significant.</p>	<p>Not significant</p> <p>If managed correctly</p>

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
003	Greenhouse gas emissions from vehicles and site equipment during exploratory operations.	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections.</p> <p>Vehicles are to be serviced and maintained to manufacturer's / industry standards.</p> <p>Regular maintenance and inspections are to be conducted as directed by written procedures.</p> <p>Drivers are to receive training / induction on driving techniques and site rules.</p> <p>Vehicles when not in use to be switched off.</p> <p>An Air Quality Impact Assessment has been undertaken and has determined that:</p> <ul style="list-style-type: none"> At the neighbouring residential locations, where frequent and long term human exposure might be expected, all pollutant process contributions were considered insignificant based on Environment Agency assessment criteria and unlikely to threaten ambient air quality standard attainment. At the sites sensitive to nitrogen and acid deposition (Edolph's Copse LNR and Mole Gap to Reigate Escarpment SAC) maximum process contributions are considered to be insignificant based on Environment Agency assessment criteria and considered unlikely to pose any threat to, or have any substantial influence on, the attainment of critical levels and critical loads. 	<p>Very Low</p> <p>Emissions from vehicles and site equipment exhaust systems will occur throughout the operation.</p>	<p>Very Low</p> <p>Impact on global warming but deemed not significant.</p>	<p>Not significant</p> <p>If managed correctly</p>

ASSESSMENT OF DISPOSAL OR RECOVERY OF WASTE PRODUCED ONSITE

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Waste Clays and Sand	Transportation from site by road to Licenced Waste Facility.	Licenced Waste Facility. Along traffic route.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
002	Drilling Mud and Waste	Transportation from site by road to Licenced Waste Facility.	Licenced Waste Facility. Along traffic route.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
003	Wellbore Suspension Brine.	Transportation from site by road to Licenced Waste Facility.	Licenced Waste Facility. Along traffic route.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
004	Flowback Fluid	Transportation from site by road to Licenced Waste Facility.	Licenced Waste Facility. Along traffic route.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
005	Cement from Cementing Operations.	Transportation from site by road to Licenced Waste Facility	Licenced Waste Facility. Along traffic route.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All skips will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
006	Natural Gas	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Natural gas will be diverted to Specified Generators (Gas Power Engines) where it will be used as a product for onsite power generation and production of electricity for offsite exportation.</p> <p>In the event that natural gas is required to be incinerated (well maintenance operations or for safety reasons) the natural gas will be diverted to an enclosed ground flare where it will be incinerated.</p> <p>At the point of incineration, the natural gas is considered a waste (EWC Code 16 05 04). Flare unit is to be monitored and controlled at all times.</p>	Very Low Air quality not significantly affected from modelling assessment. Make regular observations over the period of operation.	Low Impact on global warming but deemed not significant.	Not significant If managed correctly
007	Spent Acid	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All skips will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
008	Run-off Water from Site Surface.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by the site traffic management plan.</p> <p>All skips will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
009	Accommodation Waste Water and Sewage.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during certain operations to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
010	Fuel Oil Spill from Power Generation.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
011	Engine, Gear and Lubricating Oils from Mobile Plant.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
012	Hydraulic Oils from Mobile Plant.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures should prevent this happening.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
013	Oil Rags / Absorbents from Mobile Plant Maintenance.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent exposure.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
014	Waste Filters from Mobile Plant Maintenance.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent exposure.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
015	Paper and Cardboard from Office Routines.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent exposure.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
016	Canteen Waste.	Licenced Waste Facility. Along traffic route.	Transportation from site by road to Licenced Facility.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent exposure.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
017	Metal from Engineering Works.	Licensed Waste Facility. Along traffic route.	Transportation from site by road to Licensed Facility.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent exposure.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly
018	Packaging from Delivered Products.	Licensed Waste Facility. Along traffic route.	Transportation from site by road to Licensed Facility.	<p>Non-Hazardous Waste Stream.</p> <p>Transportation from site to the licenced waste facility is by a licenced waste carrier in road bulk haulage vehicles.</p> <p>A licenced waste contractor will be onsite during the operation to ensure that handling, storage, documentation and onward disposal of generated wastes is in compliance with current regulations.</p> <p>Vehicles used for transportation are to be serviced and maintained in accordance with manufacturers / legislation.</p> <p>Vehicle spillage kits are to be carried during transportation of wastes.</p> <p>Vehicles are to adhere to approved traffic routes as outlined by planning authority / client.</p> <p>All tanks and storage containers will be checked for integrity.</p>	Very Low Management actions and procedures will prevent exposure.	Low Possible pollution of traffic route if vehicle involved in accident. Fly-Tipping of wastes if not delivered to licenced facility.	Not significant If managed correctly

GLOBAL WARMING POTENTIAL

Please refer to Appendix 2 of the Site Condition Report (HHDL-EPR-HHP-SCR-006)

ENERGY SOURCES, CONVERSION EFFICIENCY AND EMISSION FACTORS

Please refer to Appendix 2 of the Site Condition Report (HHDL-EPR-HHP-SCR-006)

ENERGY EMISSION FACTORS

Please refer to Appendix 2 of the Site Condition Report (HHDL-EPR-HHP-SCR-006)

ASSESSMENT OF GLOBAL WARMING RISKS

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
001	Greenhouse gas emissions from site power generation.	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Power generation is provided by drilling rig generators and / or standalone generators. Generators are powered / operated on gas oil supplied from external banded fuel tanks or from electricity produced onsite by Gas Power Engines during operations.</p> <p>During exploratory operations, the generators are usually operated 24 hours per day, thus ensuring power supply is not interrupted and the safety systems required on site ensure that the integrity and safety of the wellbore is maintained.</p> <p>Generators are maintained and serviced in line with manufacturer’s guidelines thus ensuring that they operate efficiently and minimising emissions, noise and vibration.</p> <p>Service and maintenance regimes are implemented and adhered to and all work is carried out by a competent trained electrician / mechanic.</p> <p>Generators supplied within the rig structure respond to power demand and the working load and output varies during the operations being conducted.</p> <p>When power is not required generators are switched off to reduce emissions, fuel usage, noise, vibration and wear and tear on the equipment.</p> <p>An Air Quality Impact Assessment has been undertaken and has determined that:</p> <ul style="list-style-type: none"> At the neighbouring residential locations, where frequent and long term human exposure might be expected, all pollutant process contributions were considered insignificant based on Environment Agency assessment criteria and unlikely to threaten ambient air quality standard attainment. At the sites sensitive to nitrogen and acid deposition (Edolph’s Copse LNR and Mole Gap to Reigate Escarpment SAC) maximum process contributions are considered to be insignificant based on Environment Agency assessment criteria and considered unlikely to pose any threat to, or have any substantial influence on, the attainment of critical levels and critical loads. 	<p>Very Low</p> <p>Air quality not significantly affected.</p> <p>Make regular observations over the period of operation.</p>	<p>Very Low</p> <p>Impact on global warming but deemed not significant.</p>	<p>Not significant</p> <p>If managed correctly</p>
002	Greenhouse gas emissions from flaring of natural gas during production operations.	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>In the event that natural gas is encountered during exploratory operations, it will be flowed to surface through the wellbore into fluid separation equipment, from which the petroleum is separated from produced fluids (formation water).</p> <p>Once separated, the gas is diverted via pipework to a flare unit for incineration to reduce Greenhouse gasses.</p> <p>An Air Quality Impact Assessment has been undertaken and has determined that:</p> <ul style="list-style-type: none"> At the neighbouring residential locations, where frequent and long term human exposure might be expected, all pollutant process contributions were considered insignificant based on Environment Agency assessment criteria and unlikely to threaten ambient air quality standard attainment. At the sites sensitive to nitrogen and acid deposition (Edolph’s Copse LNR and Mole Gap to Reigate Escarpment SAC) maximum process contributions are considered to be insignificant based on Environment Agency assessment criteria and considered unlikely to pose any threat to, or have any substantial influence on, the attainment of critical levels and critical loads. 	<p>Very Low</p> <p>Air quality not significantly affected from modelling assessment.</p> <p>Make regular observations over the period of operation.</p>	<p>Very Low</p> <p>Impact on global warming but deemed not significant.</p>	<p>Not significant</p> <p>If managed correctly</p>

ID	Source	Pathway	Receptor	Risk Management	Probability of Exposure	Consequence	Overall Risk
003	Greenhouse gas emissions from vehicles and site equipment during exploratory operations.	Air – Prevailing winds from south west (average statistics from the Met Office). Atmosphere.	Special Areas of Conservation Local Nature Reserves Sensitive Receptors Water Features Surrounding Environment	<p>Vehicle loads and transportation to be planned to reduce quantity of deliveries / collections.</p> <p>Vehicles are to be serviced and maintained to manufacturer's / industry standards.</p> <p>Regular maintenance and inspections are to be conducted as directed by written procedures.</p> <p>Drivers are to receive training / induction on driving techniques and site rules.</p> <p>Vehicles when not in use to be switched off.</p> <p>An Air Quality Impact Assessment has been undertaken and has determined that:</p> <ul style="list-style-type: none"> At the neighbouring residential locations, where frequent and long term human exposure might be expected, all pollutant process contributions were considered insignificant based on Environment Agency assessment criteria and unlikely to threaten ambient air quality standard attainment. At the sites sensitive to nitrogen and acid deposition (Edolph's Copse LNR and Mole Gap to Reigate Escarpment SAC) maximum process contributions are considered to be insignificant based on Environment Agency assessment criteria and considered unlikely to pose any threat to, or have any substantial influence on, the attainment of critical levels and critical loads. 	<p>Very Low</p> <p>Emissions from vehicles and site equipment exhaust systems will occur throughout the operation.</p>	<p>Very Low</p> <p>Impact on global warming but deemed not significant.</p>	<p>Not significant</p> <p>If managed correctly</p>