VAPOUR RECOVERY PLAN

RE-EPRA-WNA-VRP-011

Revision 3

July 2021

WNA Permit Variation

APPROVAL LIST

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1. INTRODUCTION

Rathlin Energy (UK) Limited (Rathlin) is a private company with its head office in Beverley, East Riding of Yorkshire. Rathlin is a petroleum exploration, development and production company with operations in the United Kingdom. Rathlin is the operator of PEDL 183.

Rathlin have prepared an application to the Environment Agency seeking permission to undertake a number of permitted activities in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (EPR2016).

The purpose of the Vapour Recovery Plan (VRP) is to provide a clear understanding of the proposed operations and the permitted activities to be applied for within this application.

2. SCOPE

This VRP is applicable to the WNA Wellsite and all operations permitted therein. It is applicable to Rathlin, its contractors and subcontractors and can be used in support of applications to the Environment Agency under EPR2016.

3. DEFINITIONS

EPR2016:	Environmental Permitting (England & Wales) Regulations 2016
HSE:	Health Safety and Environmental
PEDL:	Petroleum Exploration and Development Licence
UK:	United Kingdom

Table 3.1: Definitions

4. ROLES AND RESPONSIBILITIES

Role	Key Responsibilities
Director with Accountability for Health, Safety and Environment.	• Ensure suitable and sufficient systems, processes and resources are provided to adhere to legislative and other requirements; • Apply HSE Management standards and procedures throughout the project. • Stipulate project requirements and conditions, e.g. budget, time constraints, milestones and feedback; and • Ensure that a proactive and robust system is in place for the management of vapour recovery during operations, production operations, associated workover operations and well abandonment operations.
Country Manager	• The communication and implementation of the Vapour Recovery Plan; • The communication of the Management System structure and responsibilities to the Wellsite Supervisor; • Providing assistance and guidance in the update and approval of the Vapour Recovery Plan; • Ensuring that legislative compliance is maintained through the provision of adequate competent resources; • Ensuring that competent personnel are available to implement, monitor and assess Vapour Recovery Plan requirements; • Ensuring that roles and responsibilities are identified and the assessment of individuals is recorded; • Appointing contractors who can meet internal HSE standards through a robust tendering and/or selection process and the monitoring of contractors to ensure that these standards are being met; • The development and training of staff or assessing the competence of contractors so that they are competent and capable of carrying out their work to the required standards; • Ensuring that emergency response procedures are developed, maintained, communicated and tested for effectiveness; and • Conducting periodic audits of compliance and communicating environmental performance, significant findings and non-conformances.
Wellsite Supervisor / Site Supervisor	• Ensuring that leadership is clearly established and promoting a high degree of HSE awareness through communication of HSE Policies and responsibilities; • Ensuring that defined practices and processes are communicated; • Ensuring that, where required, monitoring and reporting relating to regulatory compliance is carried out; • Ensuring that odorous emissions are reported and investigated in accordance with internal HSE policies; • Ensuring that where required, odorous emissions are sampled to determine source and composition of the emission; • Ensuring that spillages are remediated as soon as reasonably practicable; • Ensuring that all incidents, involving, or having the potential to cause, injury or harm to personnel, damage to infrastructure or the environment are thoroughly investigated; • Ensuring that emergency response plans are tested on a regular basis, recording the results, identifying, implementing and communicating corrective actions; and • Ensuring that complaints are reported to Rathlin and thoroughly investigated.
All Personnel	All personnel are to follow the requirements of this Vapour Recovery Plan and cooperate fully with senior management. All personnel must take reasonable care to ensure that their actions do not have an adverse impact on the environment. Personnel must not intentionally or recklessly interfere with, or misuse anything that is provided in the interest of health, safety and the environment.

5. VAPOUR RECOVERY PLAN

This Vapour Recovery Plan covers the following operations to be conducted at the WNA Wellsite:

- Drilling and well testing operations;
- Production operations;
- Workover operations; and
- Well abandonment operations.

5.1 Objectives of the Vapour Recovery Plan

The primary objective of this Vapour Recovery Plan is to prevent significant impacts from the emission of Volatile Organic Compounds (VOCs) from the oil storage tanks, whose emission to air could cause pollution on local amenities, human health and the environment. This objective will be achieved through:

- Assessment of risks;
- Management of vapour recovery;
- Arrangements for the recovery of VOCs;
- Implementation of pollution control measures;
- Containment of emissions;
- Maintenance and servicing procedures;
- Emergency response procedures;
- Arrangements for monitoring and recording;
- Training of personnel;
- Audit requirements; and
- Arrangements for reviewing and revising the Vapour Recovery Plan.

5.2 Distribution of the Vapour Recovery Plan

Rathlin will communicate the Vapour Recovery Plan to the Wellsite Supervisor. A copy of the Vapour Recovery Plan is to be held within the Wellsite Supervisor's office and be available for review by regulatory bodies.

The Vapour Recovery Plan will be communicated to site personnel during site induction and a record of induction will be recorded. A copy of the Vapour Recovery Plan will be made available on site to all personnel during operations.

5.3 Alterations to the Vapour Recovery Plan

Any required changes or deviations from this Vapour Recovery Plan are to be referred to Rathlin or to the Wellsite Supervisor in the first instance. No changes to, or deviations from, this Vapour Recovery Plan are to be implemented until the required changes or deviations have been reviewed and approved by Rathlin. Alterations to the plan will be submitted to the Environment Agency for approval; however, alterations may be implemented as an immediate control measure to resolve an identified problem prior to notification to the Environment Agency.

5.4 Changes to Operations, Processes or Equipment

In the event that there are significant or material changes to operations, processes or equipment during the WNA operations, Rathlin will review the Vapour Recovery Plan. Rathlin will communicate a copy of any revised Vapour Recovery Plan to the Wellsite Supervisor and forward a copy to the Environment Agency.

6. ASSESSMENT OF RISKS

6.1 Crude Oil Vapour Risk Assessment

In support of the Vapour Recovery Plan, a risk assessment of potential VOC vapours that may be generated during the transfer, loading and unloading of crude oil has been undertaken.

The Crude Oil Vapour Risk Assessment is qualitative and details the activities and events that may lead to environmental impact on one or more receptors.

The Crude Oil Vapour Risk Assessment has assessed the potential odour risks from the proposed operations to be undertaken and includes the following information:

- Potential release points;
- Potential sources of pollution;
- Operations being carried out which may lead to emissions;
- Receptors;
- Pathway;
- Probability of exposure;
- Consequence;
- Magnitude of Risk;
- Risk management to control or minimise vapour release;
- Residual Risk; and
- Responsible Person for monitoring release points.

For clarity, the Crude Oil Vapour Risk Assessment has assessed the volume of VOCs within vapours contained within crude oil storage tanks as *'very low'*. This was based on the following:

1. Natural gas and crude oil are separated by the three phase separator; and
2. Gas vented from storage tanks has been assessed as normal air with trace amounts of VOCs.

A copy of the Crude Oil Vapour Risk Assessment is included in Appendix 1.

7. MANAGEMENT OF VAPOUR RECOVERY

Vapours containing potential VOCs are generated from the agitation of crude oil as it is transferred into crude oil storage tanks and road tankers.

During the transfer, loading and unloading of crude oil, there is the potential for VOCs to be emitted to atmosphere from storage tank vents and road tanker inspection hatches.

7.1 Arrangements for the Recovery of VOCs

7.1.1 Recovery of VOCs from Oil Storage Tanks

Vapours within the crude oil storage tank will be vented to atmosphere from the storage tank vent stack.

Due to the necessity to mitigate against odour Rathlin are proposing to connect a scrubbing unit to remove potential odorous / vaporous compounds. As it is expected that both crude oil and produced water will arise, individual scrubbers and vent release points will be required. However, should a decision be made to connect all releases to a single vent line, depending on the capability of the storage tanks, a single line and scrubbing unit will be used.

The scrubber will be designed to allow the capture and recovery of VOCs from vapours being vented during the following operations:

1. Loading (filling) of crude oil storage tanks;
2. Transfer of crude oil between crude oil storage tanks; and
3. Back venting of vapours from loading (filling) road tankers used in the transportation of crude oil offsite to the local refinery.

For safety and environmental reasons, the scrubber to be installed **must** be capable of allowing air flow both in to, and out of, the crude oil storage tanks to prevent over-pressurisation and under-pressurisation of the crude oil storage tank.

7.1.2 Recovery of VOCs from Road Tankers

During the loading of road tankers used for the transportation of crude oil offsite, vapours within the road tanker are back vented to the crude oil storage tank. The vapours flow from the road tanker via a flexible hose, to the crude oil storage tank where they will be managed in accordance with Section 7.1.1.

The Crude Oil Vapour Risk Assessment has assessed the risk from VOCs emitted to atmosphere from the road tanker as *'not significant'.*

7.2 Process of Scrubber / Air Filtration

At surface, petroleum flows from the well, through the well test / production package, which includes three (3) phase separation of water, oil (Inc. gas condensate) and gas. Produced water and oil are diverted from the separator to individual storage tanks on site. Gas is diverted to the flare for incineration or to a generator for electricity generation.

The storage tanks each have a vent outlet to allow gasses to flow out of the storage tanks to prevent over-pressurisation of the storage tanks when filling.

Due to the necessity to mitigate against odour Rathlin are proposing to connect a scrubbing unit to remove potential odorous / vaporous compounds to the fluid storage tank. As it is expected that both crude oil and produced water will arise, a number of scrubbers and vent release points will be required as the development grows. However, should a decision be made to connect all releases to a single vent line, depending on the capability of the storage tanks, a single line and scrubbing unit will be used.

Whilst the tanks are being filled with fluid, gasses will be displaced from the tanks and will flow through the vent line to the scrubber unit. When the storage tanks are being emptied to road tanker there is a foreseeable risk of a vacuum being created within the storage tank. To mitigate against this risk Rathlin will install a make up gas line into the tank to feed in nitrogen to ensure a vacuum is not created within the system.

Appendix 2 provides a technical specification of the scrubber/air filtration unit that would be used. The manufactures have also confirmed that they are designed to remove Volatile Organic Compounds.

Whilst the scrubber(s) is capable of allowing air flow both in to and out of the tanks to ensure that over-pressurisation is avoided, the maximum working pressure is 7.5 psi, which is assessed as low pressure for the filters to operate effectively.

The scrubber(s) works by allowing the vapours emitted from the storage tanks to pass through filters which have been designed to remove certain compounds, such as organics, formaldehyde ammonia, hydrogen sulphide and VOC's, by the process of physical adsorption. The removal efficiency of these compounds can vary depending on flow rates, however given that the flow rates from the storage tanks will be low, it is expected that a high removal efficiency will be achieved.

The emitted vapour will pass through the filter (carbon bed) and due to the highly porous structure of granular carbon, together with the anticipated low flow rates from the tank, high levels of contaminates will be absorbed. When the granular carbon becomes saturated with contaminants the filter will be removed and replaced.

Procedures surrounding the scrubber include monitoring its effectiveness during the lifetime of the operations. The scrubber will form part of the daily checks undertaken by the Wellsite Supervisor. These checks include monitoring for odour emitted from the scrubber and the physical condition of the drum. It will be recorded on a Daily Environmental Checklist (RE-05-CHK-008) held onsite.

Monitoring will be undertaken in the form of sniff testing to detect odour from the VOC's should they be released. If it becomes apparent that the scrubber is not as effective as it should be then additional scrubbers can be installed along the vent line. Air quality monitoring will also be taking place around the wellsite in which VOC's will be a parameter to be monitored. The air quality monitoring undertaken will include the same methods as that undertaken as part of the previous well testing operations, thought he frequency in which the monitoring is undertaken is likely to reduce as the production operations become routine.

In the event the scrubber is in need of maintenance, such as filter medium replacements then the manufacturer will be contacted to provide maintenance service.

7.3 Future and Alternative Recovery of VOC's

As the development progresses, and vapours emitted from the produced oil are identified and understood, an assessment will take place to identify whether a better technique is available to manager or harness the vapour, i.e. co-mingle with gas flow to generator sets. However, such techniques can only be confirmed as suitable once the development has commenced and the vapours emitted are understood. Should an alternative technique be identified then the Environment Agency will be informed and the necessary permission will be sought to operate the identified technique.

8. IMPLEMENTATION OF POLLUTION CONTROL MEASURES

The Wellsite Supervisor is ultimately in control of what activities are being undertaken at the well site. They will ensure that pollution control measures are implemented to prevent the emission of vapours containing VOCs, whose emission to air could cause pollution. Control measures to be implemented include, but are not limited to:

- Installation of a VOC scrubber or equivalent specification on each vent stack or single co-joined vent stack (per tank inventory);
- Tank levels monitored to prevent overfilling;
- Transfer of products to be monitored by wellsite personnel;
- Checks of containment and transfer systems to ensure integrity is maintained;
- Where possible, breaking containment to be undertaken at cessation of operations;
- Purge equipment prior to breaking containment;
- Plug / cap tanks, pipes, hoses etc. after breaking containment;
- Wellsite / vehicle spillage kits to be readily available;
- Spillages to be remediated immediately;
- All spillages to be reported;
- Emergency response plan established / tested; and

Training on environmental awareness for wellsite personnel.

The procedure of each control measure is provided in Section 8.1 to Section 8.12.

8.1 VOC Scrubber

A VOC scrubber (Drum Filter Vessel (AAC DFV200)) or equivalent specification will be installed on each vent stack or single co-joined vent stack (per tank inventory) to prevent the emission of vapours containing VOCs, whose emission to air could cause pollution.

The manufacturer's information sheet, included within Appendix 2, identifies that it has been used for the following typical applications:

- Storage tank vents;
- Vacuum pump discharges;
- Road tanker transfer stations;
- Blood storage tanks;
- Animal rendering plants; and
- Odour removal within Diaries.

To ensure that the VOC scrubber is maintained and effective, it will be checked daily by the Wellsite Supervisor or their nominated delegate and the check recorded on the Daily Environmental Checklist (RE-05-CHK-008). Checks to be undertaken will include, but not limited to:

- Monitoring (by sniff test) of odour emissions from the VOC scrubber;
- Integrity of the VOC scrubber; and
- Integrity of the connecting hose from the vent stack to VOC scrubber.

The VOC scrubber will be changed if:

- Odour is detected from the VOC scrubber; and
- The integrity of the VOC scrubber has been compromised.

In the event the scrubber is in need of maintenance, such as filter medium replacements then the manufacturer will be contacted to provide maintenance service.

8.2 Monitoring of Tank Levels

To ensure that the maximum capacity of storage tanks is not exceeded and that any potential losses are identified, the following checks will be undertaken:

- Tank levels monitored on a regular basis to ensure maximum levels are not exceeded / losses identified;

Checks will be recorded on the Daily Environmental Checklist (RE-05-CHK-008) by the Wellsite Supervisor or their delegate.

8.3 Product Transfer

To ensure that spillages from the transfer of products does not occur, the following checks will be undertaken:

- Prior to the commencement of transfer:
  - Check tank levels to ensure the volume of product to be transferred can be accepted;
  - Visual inspections of the integrity of:
    - Delivery / storage tanks prior to transfer;
    - Ancillaries including pipework, hoses, valves, gauges etc.
- During transfer operations:
  - Visual inspections for leaks / emissions during transfer operations;
- At cessation of transfer operations:
  - Pipework, hoses, valves, gauges etc. are closed/capped/plugged etc.
- Monitoring of transfer operations will be undertaken by competent site personnel.

Checks will be recorded on the Daily Environmental Checklist (RE-05-CHK-008) by the Wellsite Supervisor or their delegate.

8.4 Integrity Checks of Transfer and Containment Systems

To ensure that the integrity of transfer and containment systems is maintained throughout the operations, the following checks will be undertaken:

- Visual inspections of the integrity of:
  - Primary containment systems;
  - Secondary containment systems; and
  - Ancillaries including pipework, hoses, valves, gauges etc.

Checks will be recorded on the Daily Environmental Checklist (RE-05-CHK-008) by the Wellsite Supervisor or their delegate.

8.5 Breaking Containment

Where practicable, the breaking of containment will be undertaken at the cessation of operations. Prior to the breaking of containment, the following checks are to be undertaken:

- Prior to breaking containment:
  - Where practicable, purging of the system has been undertaken;
  - Pressurised systems have been depressurised;
- Following breaking containment:
  - Pipework, hoses, valves, gauges etc. are to be closed/capped/plugged etc.
- Spill response equipment is to be readily available;

Checks will be recorded on the Daily Environmental Checklist (RE-05-CHK-008) by the Wellsite Supervisor or their delegate.

8.6 Purging of Equipment

Purging of equipment shall be undertaken prior to breaking containment by competent personnel in accordance with procedures using non-hazardous products.

The operator shall ensure that liquids used for purging shall be contained and disposed of in accordance with current legislation.

8.7 Plugging and Capping

Following breaking containment, and where purging cannot be undertaken, pipework, hoses, valves, gauges etc. are to be closed / capped / plugged etc.

Prior to removal offsite, all pipework, hoses, valves, gauges etc. shall be checked by a competent person to ensure that they remain closed / capped / plugged etc. during transport, where necessary.

8.8 Spillage Response

All spillages are to be remediated immediately or as soon as practicable.

Used spillage equipment shall be disposed of in accordance with current legislation to an Environment Agency licenced waste disposal / waste treatment facility.

8.9 Reporting of Spillages

All spillages are to be reported to the Wellsite Supervisor who will maintain a record of all spillages throughout the operation.

8.10 Emergency Response Plan

All personnel are to ensure that in the event of an incident occurring, the Emergency Response Plan shall be followed.

The Wellsite Supervisor is to ensure that the plan is established, tested and any deficiencies documented and corrective action implemented.

8.11 Environmental Awareness Training

Rathlin Energy shall ensure that where required, site personnel shall receive environmental awareness training.

9. CONTAINMENT OF EMISSIONS

There is the potential for vapours containing VOCs to be contained within pipes, hoses etc. used within crude oil transfer and loading operations.

Where practicable, pipes, hoses etc. will remain sealed until cessation of operations thus reducing the likelihood of potential emissions. Where possible, purging of the system is to be undertaken prior to breaking containment.

Tanks and pipework containing potential emissions are to be checked on a regular basis by the service provider and the Wellsite Supervisor for leaks and / or damage to the containment system. All checks are to be recorded and a record held within the Wellsite Supervisor's office and be available for review by regulatory bodies.

10. MAINTENANCE AND SERVICING PROCEDURES

Maintenance and servicing of storage tanks, equipment, pipework, hoses etc. will be undertaken in accordance with the manufacturer's recommendations. Rathlin will ensure that the risk of potential emissions from the breaking of containment during maintenance and servicing of equipment is reduced to a minimum and the potential for equipment failure is reduced.

Control measures to eliminate or reduce potential emissions include, but are not limited to:

- Purging equipment prior to breaking containment;
- Conducting maintenance or servicing inside buildings or covered areas where practicable;
- Containment of emissions; and
- Compliance with waste storage / disposal procedures.

The breaking of containment, specifically the breaking containment of pipework and the opening of stock tanks will ideally only be undertaken at the end of operations, to limit the potential for any odourous compounds to be emitted.

Pipework which has been the subject of transporting wellbore fluids and gasses will be subject to a purging process which will use either water or nitrogen. However, the exact method of purging and cleaning cannot be confirmed until an appropriate contractor has been appointed.

Stock tanks will also be subject to a purging and cleaning process. The purging process will be undertaken once the tank has been emptied, most likely at the end of operations and prior to cleaning. Again the purging and cleaning process cannot be confirmed until the appropriate contractor has been appointed.

The processes for purging and cleaning pipework and tanks will be agreed with the Environment Agency following appointment of the contractor and prior to the operations commencing.

11. EMERGENCY RESPONSE PROCEDURES

11.1 Emergency Action Plan

In the event of an incident occurring, the Wellsite Supervisor is to comply with the Emergency Response Plan ensuring, if safe to do so, immediate action is undertaken to isolate, contain and prevent an emission of vapours from entering the atmosphere.

Spillages occurring during the transfer of crude oil are not to be hosed down or detergents used to remediate the spillage.

Remediation of the spillage is to be undertaken and the contaminated soil is to be removed, segregated and disposed of to an Environment Agency licensed facility as hazardous waste.

11.2 Spillage Response Equipment

Spillage response equipment is located onsite. During site inductions, personnel will be shown the location of spillage equipment, how to use the equipment correctly and how to store and use materials safely.

Spillage equipment is to be labelled and checked on a regular basis by the Wellsite Supervisor and unserviceable items quarantined and replaced.

12. MANAGEMENT ARRANGEMENTS

12.1 Monitoring and Recording

12.1.1 Daily Environmental Monitoring

The Wellsite Supervisor is to undertake daily environmental monitoring and a record is to be held onsite. Environmental monitoring is to include checks on wellsite equipment, secondary containment systems and hazardous materials for visible signs of leaks, damage or contamination. The Environmental Checklist is to include components and equipment that have the potential to emit vapours containing VOCs including, but not limited to:

- Crude oil storage tanks, associated pipework and vent stacks;
- VOC scrubbers; and
- Pipes and hoses etc. used in the transfer of crude oil.

12.2 Training of Personnel

All personnel involved in the management of vapour recovery will receive training prior to commencement of their responsibilities. Training will be undertaken by Rathlin and a record of training will be recorded and held on site.

12.3 Audit Requirements

Senior management will conduct periodic audits of compliance with the Vapour Recovery Plan and communicate environmental performance, significant findings and non-conformances.

The Wellsite Supervisor will ensure sufficient priority is placed on undertaking audits and ensure that performance and findings from audits, inspections and non-conformances is communicated to site personnel and contractors.

12.4 Arrangements for Reviewing and Revising the Vapour Recovery Plan

Rathlin will periodically review the Vapour Recovery Plan or when significant changes to operations or site equipment have occurred and amend where necessary in accordance with the Rathlin document control procedure.

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APPENDIX 1 – CRUDE OIL VAPOUR RISK ASSESSMENT

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1. Abbreviations and Definitions

Definitions for the Environemntal Risk Assessment	
ID:	Identification number the hazard has been given to allow for easy referencing.
Activity / Event	The specific operating being undertaken relating to the proposed hazard and risk.
Potential Release Point	The point at which the pollutant / emission leaves its dedicated infrastructure and enters the environment.
Source	A source of pollutants from the activity taking place such as flaring. (Source can also be referred to as 'hazard').
Pathway	The pathway the pollutant is taking such as air or unsaturated zones.
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.
Exposure Probability	The chance of the hazard occurring without taking into account mitigation measures.
Impact Severity	The impact of the hazard should it occur without taking into account mitigation measures.
Risk Magnitude	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.
Risk Management	Mitigation measures that will be put in place to control the risks so far as reasonably practicable.
Residual 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 is not expected to cause 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.
Other Definitions	
PEDL	Petroleum Exploration and Development Licence
WNA	West Newton A

Table 1.1: Definitions

2. Methodology

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

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

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 2.1: 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 2.2: 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 2.3: 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.

Consequence	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 2.4 Risk Rating Definition

Receptors	Search Radius (km)	Name	Distance (km)	Direction from Site	Grid Reference (Edge)
RAMSAR	10	None	-	-	-
Special Areas of Conservation (SAC)	10	None	-	-	-
Special Protection Areas (SPA)	10	Hornsea Mere	6.93	North	TA 17983 46008
Marine Protection Areas (MPA)	10	Greater Wash	5.24	Northeast	TA 23650 42421
Sites of Special Scientific Interest (SSSI)	2	Lambwath Meadows	0.79	Northeast	TA 20100 39699
Scheduled Ancient Monuments (SAM)	2	Burton Constable medieval settlement and field system.	1.92	South	TA 18852 37191
National Nature Reserves	2	None	-	-	-
Local Nature Reserves	2	None	-	-	-
Local Wildlife Sites (LWS)	2	The Moors, Burton Constable	0.84	South	TA 18876 38359
		Wycliffe, North Plantation	0.92	South	TA 18676 38389
		Mill Avenue, Burton Constable	1.27	South	TA 19442 37093
		Sallymere Plantation	1.70	Southwest	TA 17778 38222
		Burton Constable Parkland	1.77	South	TA 19098 37311
Water Features (Closest in All Directions)	2	Field Drain	0.01	West	TA 19231 39097
		Field Drain	0.06	North	TA 19235 39265
		Pond at Black Bush Cottage	0.34	East	TA 19815 39298
		Field Drain	0.53	South	TA 19372 38533
		Field Drain	0.90	East	TA 20381 39178
Sensitive Receptors: Households / Businesses	2	Church House	0.53	Southwest	TA 18916 38673
		Old School House	0.58	Southwest	TA 18948 38593
		Wood End Farm	0.63	West	TA 18625 38977
		Black Bush Farm	0.40	East	TA 19892 39301
		Caley Cottage	0.46	East	TA 19947 39168
		High Fosham Cottage	0.52	East	TA 19991 39142
		Marton Farm	0.78	West	TA 18481 39216
		White House Farm	0.84	Southwest	TA 18618 38534
		Straits Farm (Withernwick)	0.92	North	TA 19571 40124
		Manor House	0.92	Northeast	TA 19804 40071
		Piper Garth	1.05	West	TA 18214 39235
		Wood House	1.15	South	TA 19077 37949
		West Newton Village	1.11	South	TA 19544 37955
		Heywood Farm	1.16	West	TA 18095 39261
		Treasure Cottage	1.30	West	TA 17952 39248
		Model Farm	1.32	Southeast	TA 19912 37803
		Hill Farm	1.52	West	TA 17710 39289
		Mount Pleasant	1.39	Southeast	TA 20163 37846
		Homer House	1.42	Northeast	TA 20285 40378
		Farm at Low Fosham	1.43	East	TA 20878 38786
		Old Farm Cottage	1.49	Southeast	TA 20352 37829
		Withernwick Hall	1.81	North	TA 19635 41070
		Longdykes Farm	1.91	Northwest	TA 18325 40764
		Northfield Cottage	1.99	North	TA 19463 41185

ID	Activity / Event Leading to Emission	Potential Release Point	S-P-R Linkage			Exposure Probability	Impact Severity	Risk Magnitude	Risk Management	Residual Risk
			Source	Pathway	Receptor					
01	Storage of Crude Oil During Testing or Production.	Vent Line	Volotile Organic Compounds	Carried on Prevailing Winds	• SPA • MPA • SSSI • SAM • LWS • Sensitive Receptors • Water Features	Low	Low	Low	• Elevation of vent line(s) to increase dispersion. • Storage capacity shall be complied with. • Equipment to be serviced/maintained. • Installation of breathable VOC scrubber to eliminate odour (where required). • Storage tanks connectted via a co-joined vent line (where required).	Not Significant
02	Storage of Crude Oil During Testing or Production. Planned Breaking of Containment.	Pipework	Volotile Organic Compounds	Carried on Prevailing Winds	• SPA • MPA • SSSI • SAM • LWS • Sensitive Receptors • Water Features	Low	Low	Low	• Breaking containment operations at cessation of operations (where posssible). • Purge equipment prior to breaking containment. • Plug/cap tanks, pipes, hoses etc. after breaking containment. • Competent operators.	Not Significant
03	Storage of Crude Oil During Testing or Production. Equipment Failure.	Containment Bund / Pipework	Volotile Organic Compounds	Carried on Prevailing Winds	• SPA • MPA • SSSI • SAM • LWS • Sensitive Receptors • Water Features	Very Low	Low	Not Significant	• Use of secondary containment systems / bunds. • Equipment to be serviced/maintained. • Regular inspection of connections and pipes for failure or leaks. • Competent operators. • Emergency procedures in place and understood. • Persons trained on emergency procedures.	Not Significant
04	Transfering of Crude Oil to Road Tanker. Loading of Oil.	Temporary Connections	Volotile Organic Compounds	Carried on Prevailing Winds	• SPA • MPA • SSSI • SAM • LWS • Sensitive Receptors • Water Features	Low	Low	Low	• Tanker drivers suppervised to ensure suitable connections are made. • Hoses used in the transfer of oil shall be capped before departing the site. • Tanks sealed after transfer, with exception to the vent. • Temporary connections subject to secondary bunding to capture risidual oil.	Not Significant
05	Transfering of Crude Oil to Road Tanker. Planned Breaking of Containment.	Temporary Connections	Volotile Organic Compounds	Carried on Prevailing Winds	• SPA • MPA • SSSI • SAM • LWS • Sensitive Receptors • Water Features	Low	Low	Low	• Where possible, plan for breaking containment operations at cessation of operations. • Hoses used in the transfer of oil shall be capped before departing the site. • Tanks sealed after transfer, with exception to the vent. • Temporary connections subject to secondary bunding to capture risidual oil.	Not Significant
06	Transfering of Crude Oil to Road Tanker. Equipment Failure.	Containment Bund / Temporary Connections	Volotile Organic Compounds	Carried on Prevailing Winds	• SPA • MPA • SSSI • SAM • LWS • Sensitive Receptors • Water Features	Very Low	Low	Not Significant	• Tanker drivers suppervised to ensure suitable connections are made. • Use of secondary containment systems / bunds. • Equipment to be serviced/maintained. • Regular inspection of connections and pipes for failure or leaks. • Competent operators. • Emergency procedures in place and understood. • Persons trained on emergency procedures.	Not Significant

APPENDIX 2 - SCRUBBER SPECIFICATION

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LEADERS IN AIR & LIQUID PHASE FILTRATION TECHNOLOGY

AAC DFV200 - *Drum Filter Vessel*

The AAC DFV200 Drum Filter Vessel is a low cost, simple-to-install, single-use Filter that is designed for VOC Abatement in vapour and low flow rate applications.

This simple-to-install Filter is ideal for the efficient removal of organic and inorganic odours, such as formaldehyde, ammonia and hydrogen sulphide from the air or gas streams.

The AAC DFV200 Drum Filter requires no maintenance and is manufactured in mild steel with optional pallet mounting for easy handling. Polypropylene units are also available for highly corrosive applications (can also be supplied in 316 stainless steel and ducted spigot connections).

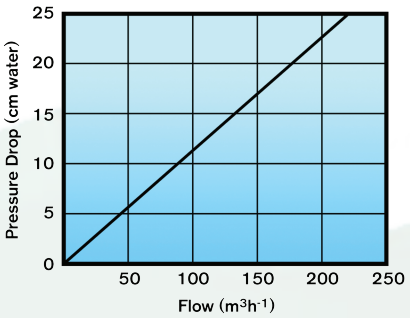
*** NOTE:**

The AAC DFV200 Drum Filter Vessel can be installed in series for longer contact and higher efficiencies.

AAC DFV200 - Drum Filter Vessel

Features & Benefits:

- No maintenance required by the operator
- Suitable for use with a variety of specialist Activated Carbon
- Can be installed in series or parallel for longer contact and higher efficiencies
- Robust mild steel construction, internally lined for chemical resistance
- Polypropylene units are available for highly corrosive applications
- Optional pallet mounting for easy handling
- Low cost
- Easy to install
- Readily available
- Easy to dispose



Typical Applications:

- Storage Tank Vents
- Vacuum Pump Discharges
- Road Tanker Transfer Stations
- Blood Storage Tanks
- Animal Rendering Plants & Odour Removal in Dairies

We can supply low cost, project-specific coal and coconut-based Activated Carbon for the AAC DFV200 Drum Filter to provide the optimum performance for each application.

* Absorber Data

Maximum Flow	250m³/h
Height	90cm
Diameter	58cm
Gross Weight	120kg
Maximum Pressure	7.5 psi
Connections	2″ BSP Female
Material of Construction	Mild steel/Propylene/ Stainless Steel

Address: *AAC Eurovent Ltd, AAC House, Unit K, Maybrook Industrial Estate, Maybrook Road, Brownhills, West Midlands. WS8 7DG. UK*
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