APPLICATION TO VARY PERMIT EPR/BK1341N
VALERO PEMBROKESHIRE OIL TERMINAL
Supporting Information Document

Valero Pembrokeshire Oil Terminal Limited

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Supporting Information
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NON-TECHNICAL SUMMARY

Introduction

The Valero Pembrokeshire Oil Terminal Limited (VPOT) are the operators for environmental permit reference EPR/BK1341IN. The permit allows VPOT to operate a fuel and oil storage facility which imports materials by ship, and exports materials by ship and mainland pipeline.

This variation seeks to permit a new pipeline connection from existing storage tanks on the VPOT site into the existing cross-Haven pipeline to transfer crude oil and oily water to the Valero Energy Refinery facility. This variation application is seeking to add the activity of transferring crude oil and oily water via pipeline into the cross-Haven pipeline as a new DAA.

Site Location

VPOT is located in Waterston, in the county of Pembrokeshire. The address of the facility is Main Road, Waterston, Milford Haven, SA73 1DR. The national grid reference for the facility is SM 9304 3496.

VPOT is located within 500 m north from Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC) and the Milford Haven Site of Special Scientific Interest (SSSI). The Scoveston Fort SSSI is located approximately 1.3 km north east of the facility.

The Pembrokeshire Coast Path runs through the southern portion of the permitted facility and lies approximately 195 m from the western boundary of the facility. The nearest residential properties lies approximately 120 m north east of the facility's northern tip at Meadow Way. The immediate area north and west of the facility is comprised of industrial and commercial properties. The village of Hazelbeach is located approximately 350 m to the east of the facility and Venn Farm hiking area is approximately 350 m to the west of the facility.

Operations

The existing VPOT activities are regulated under Section 1.2 A1 (e) of the Environmental Permitting (England and Wales) Regulations 2016[1] (EPR), which is the activity of:

> Loading, unloading or other handling of, the storage of, or the physical, chemical or thermal treatment of crude oil.

However, the permit limits the activity to:

> Receipt and storage and the dispatch of crude including:
>
> (i) Jetty operations
>
> (ii) Crude storage

There is also a Directly Associated Activity (DAA) which allows for the facility to connect to the Mainline Pipeline pumping station located north of the facility. Fuel and oils are stored in Class 1 tanks. The facility can store upto 1,277,842 m^3 of highly flammable (CLASS 1) substances and 346,119 m^3 for flammable (CLASS 2). The facility does not carry out any treatment activities.

The proposed variation will not change the storage capacity at the VPOT site or introduce new storage tanks. The permit already allows for the storage of crude oil and the proposal is to use 3 of the existing tanks for storage of this fuel.

New pipework will be installed to connect the existing storage tanks to the cross-Haven pipeline. The transfer of crude oil will be pumped using either new smaller pumps or modifying the existing pumps to

[1] https://www.legislation.gov.uk/uksi/2016/1154/contents/made

provide a reduced duty. The transfer operation will be designed with the ability to operate continuously 24/7 all year around.

The installation currently has two active point source emissions into water, one to the east (Release Point C), and one to the west (Release Point D). These will remain in place and will not require any changes to emission limits or discharge volumes as a consequence of this variation.

Management of Activities

VPOT operate a Commitment to Excellence Management System (CTEMS), which includes an environmental management system. CTEMS establishes a systematic approach to planning, executing, checking and acting to improve Valero's everyday work activities. A guiding principle of CTEMS is to install and operate properly designed and engineered facilities, plant, equipment and to maintain them in a safe condition. CTEMS will remain in place, subject to updates because of this variation and future continual improvement.

Operational staff at the VPOT will be fully trained in the systems and procedures for operating the cross-Haven pipeline and the actions to be taken in the event of an unexpected or abnormal operating condition and/or emergency.

A training policy and training plans are in place for all staff roles at the facility, these include specific training relevant to the environmental permit and operation of the facility to minimise risk to the environment. Training records for all staff are kept demonstrating competency.

Raw Materials, Water and Waste

The facility will be storing up to circa 255,100 m^3 of crude oil at any one time between Tanks 9, 11 and 12. The permit currently allows the storage of crude oil and therefore this will not represent a change to the permitted operations.

Tank draw-off water from the storage tanks is treated through the effluent treatment plant which has emission limit values set within the permit. This existing effluent treatment activity is not changing but for completeness it is requested that this activity be included as a DAA in the permit.

Waste oils removed from the effluent treatment will be handled, stored and managed as per current arrangements.

Emissions to Air

There are no changes to the permitted point source emission to air as a result of this variation.

Emissions to Surface Water, Sewer, Effluent Treatment Plants or Other Transfers off Site

There are no changes to the permitted emissions to water as a result of this variation.

The proposed changes will not introduce increased volumes of water above that which is currently generated. The atmospheric plate interface (API) oil separation system was designed and implemented at the time the facility operated as a Refinery and was handling and storing crude oils. On this basis the existing treatment system is considered appropriately designed for management of water build-up from tanks storing crude oil. Given the permitted releases limits and volumes will remain appropriate the associated impacts from aqueous releases will not change.

Whilst the effluent treatment system does have emission limits set within the permit, it is not listed as a DAA. This variation seeks to regularise this add this activity as a DAA.

On occasions oily water from crude oil storage may be transferred off site via the cross-Haven pipeline of by road tankers, to the Valero Pembroke Refinery for treatment.

Emissions to Land

There are no emissions to land.

Fugitive Emissions

The VPOT Environmental Risk Assessment will be revised to include the new connection to the cross-Haven pipeline activities and the “failure scenarios” set out in the HAZID report. This latter information will be taken from the COMAH Safety Report risk assessment which is due for submission by March 2025.

The storage of crude oil will take place within tanks which have external floating roofs (EFRs) with primary and secondary seals and are Class 1 tanks, suitable for storing crude oil. A recent leak detection and repair (“LDAR”) exercise using infra-red technology has demonstrated the suitability of the existing pipework for the handling of crude oil with minimal fugitive releases of VOCs. The integrity of the new pipework will be tested during commissioning.

Given the storage of crude oil is already permitted fugitive emissions associated with this activity does not represent a change. Fugitive emissions will be assessed annually and included in the annual reporting of fugitive releases.

Odour

The variation will not introduce any new sources of odour as the storage of crude oil is already a permitted activity. The storage of crude oil will take place within Tanks 9, 11 and 12 which have external floating roofs (EFRs) with primary and secondary seals minimising the risk of odour releases.

The transfer of crude oil will take place within a fully enclosed pipeline which also minimises any potential for odour releases.

Noise and Vibration

The variation will not introduce any new sources of noise and vibration as the cross-Haven pipeline is a legacy pipeline from a time when the facility operated as a refinery. A new section of pipeline will be installed connecting the three crude oil tanks to the pipeline. It is not anticipated that the operation of this small section of pipeline this will cause noise or vibration which is greater than that produced by the wider facility operations.

Best Available Techniques

A BAT assessment was produced by RPS in 2016 and provides a review of Best Available Techniques (BAT) Reference Document for the Refining of Mineral Oil and Gas, 2015. Since then, a number of Improvement Conditions (ICs) were set by Natural Resources Wales (NRW) within the permit to further review some of the BAT conclusions and these have been reviewed and accepted by NRW.

Section 6 of this report specifically considers changes resulting from this variation against relevant BAT Conclusions and concludes that BAT is met.

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1 INTRODUCTION

1.1.1 This document and associated appendices support the application to vary the Environmental Permit at Valero Pembrokeshire Oil Terminal (VPOT) under the Environmental Permitting Regulations 2016 (as amended)[1].

1.1.2 The VPOT permitted installation has been operated by the Valero Pembrokeshire Oil Terminal Limited, in compliance with environmental permit reference EPR/BK1341IN since 2018.

1.1.3 The facility commenced operating as an oil refinery and oil storage terminal in 1967 and was operated by Gulf Oil until 1998, when the refinery activities were decommissioned. Between 1998 and 2007, the facility underwent a range of infrastructure changes which separate the site into independent operational areas that were sold to new companies by the operator Petroplus. In 2007 Sem Logistics Milford Haven Limited were operating the installation as a bulk oil storage terminal. Refined products and some crude oil were received and exported via marine berths. The refinery process units and associated equipment was dismantled and removed from the installation in 2007. Valero Pembrokeshire Oil Terminal Limited purchased Sem Logistics Milford Haven Limited in 2018 and became responsible for the operations at VPOT.

1.1.4 VPOT is currently operated as a bulk oil storage terminal, where all products are received via marine berths. Products are exported via marine berths and Mainline Pipeline (MLP). The VPOT – MLP connection was recommissioned, and gasoline and distillate fuels (kerosene, diesel and gas oils) are exported via the MLP pump station in Waterston to Valero Manchester and Kingsbury terminals.

1.1.5 Due to the reinstatement of the historic oil pipeline beneath the Milford Haven which connects VPOT with the Valero Energy Refinery, crude oil storage is to commence and will be transferred from storage tanks which are already available on the VPOT site to the Valero Energy Refinery facility via the pipeline. This variation application is seeking to add the activity of transferring crude oil via the cross-Haven pipeline as a new DAA.

1.1.6 The permitted activities for the installation allow for VPOT to operate a fuel and oil storage facility which imports and exports materials by ship and mainland pipeline.

1.1.7 The activities are regulated under Section 1.2 A1 (e) of the Environmental Permitting (England and Wales) Regulations 2016 (EPR), which is the activity of:

> Loading, unloading or other handling of, the storage of, or the physical, chemical or thermal treatment of crude oil.

1.1.8 There is also a Directly Associated Activity (DAA) which allows for the facility to connect to the Mainline Pipeline pumping station located north of the facility. Fuel and oils are stored in Class 1 tanks providing storage capacity for 1,277,842 m^3 of highly flammable (CLASS 1) substances and 346,119 m^3 for flammable (CLASS 2).

1.1.9 Hazard substance consents are held at the facility in accordance with The Planning (Hazardous Substances) Regulations. The hazardous substance consents are constructed such that products classed as ‘Flammable’ (Class 2) can also be stored in tanks that have consents as ‘highly flammable’ (Class 1) products. As such the maximum quantities of flammable products is the sum of ‘Flammable’ and ‘Highly Flammable’. Crude Oil is Class 1.

1.1.10 Hazardous substance consented quantities for the facility are:

- Highly flammable (CLASS 1) 1,277,842 m^3
- Flammable (CLASS 2) 346,119 m^3.

1.1.11 The facility does not carry out any treatment activities.

1.1.12 The installation currently has two active point source emissions into water, one to the east (Release Point C), and one to the west (Release Point D). The eastern water discharge is set-up with an effluent treatment system, prior to discharging into the Milford Haven. The western

discharge is designed for rainwater collection and consists of a lagoon prior to discharging into a stream, which then feeds into the Milford Haven. Tanks 9, 11 and 12 are located in the West Tankage area and oily water will be pumped to Tanks 875 and 876 for settlement before being pumped to the effluent treatment system and discharged via Release Point C.

1.1.13 Both discharge points require monitoring through the conditions of the current environmental permit. However, the effluent treatment activity is not listed within Schedule 1 of the permit. Whilst the effluent treatment activity is not new and no change to the existing facility is proposed this variation seeks to add this activity as a DAA to ensure the permit accurately covers the permitted activities.

1.2 Site Location

1.2.1 The Valero Pembrokeshire Oil Terminal (VPOT) is located in Waterston, in the county of Pembrokeshire. The address of the facility is Main Road, Waterston, Milford Haven, SA73 1DR.

1.2.2 The national grid reference for the facility is SM 9304 3496.

1.2.3 The following ecological sites are located within 1 km of VPOT:

- Pembrokeshire Marine / Sir Benfro Forol Special Area of Conservation (SAC),
- Milford Haven Site of Special Scientific Interest (SSSI)
- Scoveston Fort SSSI.

1.2.4 The Pembrokeshire Coast Path runs through the southern portion of the permitted facility and lies approximately 195 m from its western boundary.

1.2.5 The nearest residential properties lie approximately 120 m north east of the facility's northern tip at Meadow Way. The village of Hazelbeach is located approximately 350 m to the east of the facility and Venn Farm hiking area is approximately 350 m to the west of the facility.

1.2.6 The immediate area north and west of the facility is comprised of industrial and commercial properties.

1.2.7 There are no changes to the site layout or boundary as a result of this variation.

1.3 The Applicant

1.3.1 The applicant and operator of the site is Valero Pembrokeshire Oil Terminal Limited, registered on Companies House as company number 03601913 and whose registered office is 27th Floor, 1 Canada Square, London EC14 5AA.

1.4 Regulated Installation and Applicable Guidance

1.4.1 The activities are regulated under Section 1.2 A1 (e) of the Environmental Permitting (England and Wales) Regulations 2016 (EPR)[1], which is the activity of:

> Loading, unloading or other handling of, the storage of, or the physical, chemical or thermal treatment of crude oil.

1.4.2 There is also a Directly Associated Activity (DAA) which allows for the facility to connect to the Mainline Pipeline pumping station located north of the facility. The permit also lists two discharges to surface water.

1.4.3 Best Available Techniques (BAT) Reference Document for the Refining of Mineral Oil and Gas[2] also applies to the activities.

[2] Best Available Techniques (BAT) Reference Document for the Refining of Mineral Oil and Gas (europa.eu)

1.4.4 This variation application is seeking to add a new DAA and also acknowledge the existing effluent treatment plant as a DAA. These activities are discussed further in Section 2.1.

1.5 Pre-application Discussions

1.5.1 Pre-application discussions have been held between VPOT and Natural Resources Wales (NRW) and it has been agreed that this is a normal variation. Correspondence supporting this has been placed within Appendix C.

1.6 Structure of the Application Document

1.6.1 This section provides an overview of the proposals. This is supplemented by further details in Sections 2 – 8 as follows:

- Section 2 provides an overview of the proposed changes to the activities that necessitate this permit variation,
- Section 3 provides evidence to support the variation application,
- Section 4 addresses the operational measures which will be in place to prevent and/or control any potential environmental effects of the proposal,
- Section 5 identifies the nature of emissions from the installation,
- Section 6 provides the revised responses to the BAT Conclusions,
- Section 7 summarises the proposed changes subject to the variation application,

1.6.2 The information provided within this application has been set out with due regard to the NRW guidance.[3] Supporting documents, assessments and application forms are provided within the appendices list as set out in the contents page.

[3] https://naturalresources.wales/permits-and-permissions/environmental-permits/guidance-to-help-you-comply-with-your-environmental-permit/?lang=en

2 DESCRIPTION OF THE CHANGES

2.1 Overview

2.1.1 The proposed changes included within this variation are described in this section. All other aspects of the permitted operations and management will remain as are currently permitted unless identified below.

2.1.2 This variation is instigated by the reinstatement of the historic oil pipeline beneath the Milford Haven. Crude oil will be delivered to VPOT by ships arriving at the jetty. The oil will be transferred into one of three storage tanks which are already available on the VPOT site and subsequently transferred from the VPOT via the cross-Haven pipeline to the Valero Energy Refinery.

2.1.3 The cross-Haven pipeline is regulated by the Pipelines Safety Regulations 1996 (PSR)[4]. The pipeline is not a major accident hazard pipeline as crude oil is not a dangerous fluid within the definition of PSR. Notwithstanding this fact, many of the provisions required for a major accident hazard pipeline, e.g., major accident prevention document, will be met.

2.1.4 The VPOT environmental permit allows for the import and export of fuels and oil by ship and the storage of a variety of fuels and oils which includes crude oil. VPOT are proposing to store crude oil from shipping vessels inside three existing storage tanks. These tanks are Class 1, having been previously used for the storage of flammable light oil products which includes kerosene, diesel, and petrol and were originally built as crude oil storage tanks to directly feed the Gulf Oil Refinery, which operated at the site until 1998. VPOTs existing Hazardous Substance Consent permits storage of crude oil in these Class 1 tanks. Crude oil will fall into this category; therefore, the use of these Class 1 tanks is appropriate.

2.1.5 The historic pipeline under the Milford Haven consists of five pipes, of which one 12" diameter cross-Haven pipeline will be reinstated to transfer crude from VPOT to the Valero Energy, Pembroke Refinery, which lies to the south. No oil or product will be returned via the pipeline.

2.1.6 The activity of transferring crude oil from VPOT via the cross-Haven pipeline is not included in the VPOT environmental permit. Therefore, this variation application seeks to vary the permit to allow for this activity.

2.1.7 The new activity will not change the capacity of the facility or storage limits set out within the permit or alter any other part of the permit. The inclusion of the historic pipeline will not change the permitted boundary of the facility as the pipeline connection falls within the permitted area.

2.1.8 The permit authorises two point source emissions to water, three point source emissions to sewer, effluent treatment plant or other transfers off-site and two releases to air. There will be no changes with respect to these emissions or the emission limit as a result of this variation.

2.1.9 The permit does not have any process monitoring requirements and this variation will not introduce any.

2.1.10 There are two annual mass emission limits for cadmium and mercury within the permit. The permit also lists two discharges to surface water with associated monitoring requirements and emission limits. The variation will not alter these requirements.

2.1.11 The facility uses an effluent treatment system which consists of an oil separator (atmospheric plate interface), a lagoon, oil booms and a submerged draw off inlet, prior to discharging into the Milford Haven. This variation seeks to add the effluent treatment systems as a DAA. However, the monitoring and emission limits for this system are already listed within the permit.

2.1.12 A site layout plan showing the locations of the pipeline in relation to the permitted area can be found in Appendix B.

[4] https://www.legislation.gov.uk/uksi/1996/825/contents/made

2.1.13 A Process Flow Diagram (PFD) can also be found in Appendix B showing how the new activity links into the existing process at the site.

3 OPERATIONS

3.1.1 This section describes the proposed changes to the operations at the VPOT.

3.2 Storage Tanks and Connection to Cross-Haven Pipeline

3.2.1 The three tanks (Tanks 9, 11 and 12 identified on the site layout plan) proposed for the storage of crude oil have external floating roofs (EFRs) with primary and secondary seals. BAT 49 is to 'use floating roof storage tanks equipped with high efficiency seals'. Class 1 tanks may store highly flammable substances including crude oil and gasoline (petrol).

3.2.2 Tanks 9, 11 and 12 are suitable for storing Class 1 fuels and therefore suitable for crude oil storage. At VPOT all Highly Flammable Class I products are stored in Class I tanks fitted with either geodesic domes, internal floating roofs (IFRs) or tanks with external floating roofs (EFR).

3.2.3 The isolation valve for the cross-Haven pipeline is located within the VPOT permit boundary and will be used in an event where crude oil flow needs to be closed off to prevent oil leaving the VPOT. The location of the isolation valve has been identified in the site plan placed within Appendix B. Infrastructure beyond this isolation valve falls outside the permitted boundary. Whilst VPOT own the pipeline the transfer of crude oil beyond this point no longer falls under the permit.

3.2.4 The permit already allows the storage of crude oil on site including its storage within Tanks 9, 11 and 12. Tank 12 will have an upgraded inlet nozzle and suction to match the rates of other tanks.

3.2.5 The tanks will transfer crude oil into the cross-Haven pipeline through a new transfer line between VPOT meter skid and the crude oil discharge manifold. A recent leak detection and repair ("LDAR") exercise using infra-red technology has demonstrated the suitability of the existing pipework for the handling of crude oil with minimal fugitive releases of VOCs. All transfer pipework including the new transfer line and the cross-Haven pipeline will be subject to regular LDAR checks to ensure potential leaks are identified and repaired as necessary to reduce the risk to the environment from pollution. The cross-Haven pipeline will be fitted with a leak detection system, most likely ATMOS[5] which will ensure any leaks from the pipeline is detected promptly. Should the system detect a leak, there will be an Emergency Procedure in place which will involve shut down, isolation and depressurising of the pipeline. The procedure will also include the mobilisation of the Emergency Plan and emergency responders.

3.2.6 The location of the new pipeline connection between the tanks and the cross-Haven pipeline has been shown in the site layout plan placed within Appendix B. A process flow diagram for the crude oil transfer has also been placed within Appendix B.

3.3 Water Discharge

3.3.1 The installation currently has two active point source emissions into water, one to the east (Release Point C), and one to the west (Release Point D). The eastern water discharge is set-up with a treatment train consisting of an oil separator (atmospheric plate interface (API)), a lagoon, oil booms and a submerged draw off inlet, prior to discharging into the Milford Haven.

3.3.2 The western discharge, which is closest to the tanks proposed for crude oil storage, is designed for rainwater collection and consists of a lagoon prior to discharging into a stream, which then feeds into the Milford Haven. The discharge is indirectly into the Milford Haven Waterway via the West Stream and former RNAD reservoirs at Blackbridge.

3.3.3 Both discharge points require monitoring through the conditions of the current environmental permit. Water flow from the eastern discharge outfall is measured by a "clamp on" ultrasonic flowmeter - Siemens Sitrans FS220 combination comprising a pair of FS200 transducers and an

[5] https://www.atmosi.com/en/solutions/leak-detection/

FS020 transmitter. The MCERTS product certificate number for this combination is Sira MC190340/02. Water flow from the western discharge outfall is measured using a Siemens Sitrans FM Mag 5100W electromagnetic flowmeter, MCERTS product certificate number Sira MC080136/09.

3.3.4 The East Catch Basin is an important part of VPOT's tertiary containment infrastructure. The emergency overflow discharges into Release Point C via a labyrinth weir (refer to Section 3.5.6) and a secondary weir. would there be a direct discharge onto the public beach. The emergency overflow channel will be operated only if the secondary weir is overwhelmed. This leads to a direct discharge onto a public beach at national grid reference SM 93950 04354.

3.3.5 In normal operation, all flow should be directed through the flow meter and auto sampler. The release can be stopped by closing the valve at the bottom of the '99 steps' from the jetty road.

3.3.6 The emission limits within the permit reflect the historic refinery activities at the facility and it is unlikely the revised operations will cause the limits to be breached. Therefore no change to the existing limits is required.

3.3.7 There is a dedicated procedure for Effluent Flow Measurement, Sampling, Testing and Reporting. This procedure is part of the wider Operating Procedures, part of the CTEMS.

3.4 Effluent Treatment

3.4.1 Water drawn off from the Western Tankage, where Tanks 9, 11 and 12 are located, is pumped across in to Tanks 875 and 876 (East Tankage), where further settlement and separation of oil and water occurs. Water from Tanks 875 and 876 is periodically discharged to the API and any residual oil recovered back to Tanks 875 and 876. These tanks have a combined rated capacity of 15,000 m^3 and have high level, and high-high level alarms. The tanks are bunded, with under tank secondary containment and leak detection / inspection chamber.

3.4.2 VPOT have a specific procedure for the drawing off of water from tanks and bunds to reduce the risk of environmental incidents. This procedure is part of the wider VPOT Operational Procedures and is reviewed regularly. The procedure is referenced VPOT OPC2-1 and applies to all product storage tanks within the VPOT facility, including those tanks that will store crude oil. The API oil separation system was designed to produce effluent containing 50 ppm of oil and 50 ppm suspended solids at a flow rate on 5,500 imperial gallons per minute or IGPM (equivalent to just over 25,000 litres per minute). However, the actual flowrate is currently between 300 and 700 IGPM (1,364 to 3,182 litres per minute).

3.4.3 A plan and cross sections of the API system separator bays and details of the lining system can be found in Appendix D. The lining consists of a layers of concrete, epoxy resin and bonding primer. The API was emptied, cleaned and inspected in 2014/15. Concrete repairs carried out during this maintenance programme.

3.4.4 The majority of oil is separated at the inlet bays which will be upgraded with oil skimming or removing equipment as a result of this variation. The system has two separation bays, each are 53.7 m long by a 9.55 m wide by 2.44 m deep. Each channel has been designed for a maximum flowrate of 1500m^3 per hour. The channels provide approximately 380mm freeboard at the maximum flowrate. The length and area of both channels exceed the minimum requirements. Calculations supporting the API oil separator capacity has been placed within Appendix D.

3.4.5 Oil skimmed from the inlet bays and separation bays is stored within Tanks 875 and 876. This activity is part of the current site activities and does not represent a change.

3.4.6 The nature of the proposed changes will not introduce increased volumes of water above that which is currently generated. The API oil separation system was designed and implemented at the time the facility operated as a Refinery and was handling crude oils. On this basis the existing treatment system is considered appropriately designed for management of water build-up from tanks storing crude oil.

3.4.7 The treated water leaving the API separator flows to the East Catch Basin which has an approximate capacity of 40,900 m^3. The East Catch Basin is intended to provide emergency catchment in the event of a large oil spill and is not considered part of the treatment system. An emergency spillway structure is located on the left bank of the East Catch Basin and comprises a twin-cycle labyrinth weir set within a concrete chamber with overall plan dimensions of 5.7m by 5.0m. The front wall of the chamber acts as a breast wall to retain floating debris and oil from passing over the weir. The base of the breast wall is at 25.91mAOD. The top of the chamber is at the same elevation as the crest road (27.13mAOD). Any oil build-up on the surface of the East Catch Basin is regularly skimmed from the surface. This activity and management of the oily residue is part of the current permitted activities and this will not change as a result of this variation.

3.4.8 The East Catch Basin is registered with NRW as a large raised reservoir but is designated as a 'Not High-Risk Reservoir'. The reservoir is sealed by a 1 ft (0.3m) layer of till overlying a puddled clay blanket overlying a drainage layer. The clay lining extends over the whole footprint of the reservoir. The thickness of the clay lining varies from 18 inches (460mm) at the reservoir rim to at least 3 feet (0.91 m) at the bed of the reservoir. The lining overlays a 6 inch (0.15 m) thick drainage layer. The clay lining to the reservoir acts as an environmental barrier to protect the groundwater from pollutants from the site as well as a waterproofing system.. The reservoir has been subject to previous inspections by an APRE[6] and adhoc additional inspections as required where there is a need for additional investigations and/or repairs. Where necessary, the liner undergoes repair works to reduce the risk of pollution.

3.4.9 In September 2020 a horizontal joint was repaired to prevent leakage and in October 2022, a separate area of the clay lining was repaired. These repairs have ensured the integrity of the East Catch Basin is maintained minimising the risk of causing pollution to the environment. VPOT will carry out visual checks of the East Catch Basin at least annually as part of Terminal 'housekeeping'.

3.4.10 The outlet from the East Catch Basin is in the form of a letterbox arrangement to ensure that a high water level is always maintained. The final outflow discharges into the Milford Haven at a point just over 45 m beyond the low water mark of the spring tides. A gate valve is provided for throttling should this be required and the flow meter is in place to measure the flow from the outfall. In the event of a spillage incident, the gate valve can be shut.

3.4.11 The treatment system has a storm water bypass which operates when the flow is greater than 11,000 IGPM (over 50,000 litres per minute). Storm water, in the event the use of the storm water bypass is activated, is discharged into the Milford Haven. Should the bypass channel be in use, an alarm sounds within the control room. The bypass channel is not used during normal operations.

3.5 Alternative Effluent Management Options

3.5.1 VPOT will have in place a number of alternative options for the management of oily water (originating from crude oil storage) which would routinely be sent to the API oil separator system for treatment. Water drawn from the VPOT crude oil storage tanks will be stored within the Tanks 875 and 876, may in some circumstances be sent off site for treatment. Such circumstances may be due to the quality of the oily water or other reasons which mean the API oil separator system is not used, which ultimately means there is less effluent being treated and discharged into the Milford Haven.

3.5.2 The oily water from the Tanks 875 and 876 may also be transferred to the Refinery via road tankers for treatment. This method will mean the oily water leaves the facility as a waste and will be accompanied with relevant hazardous waste consignment notes.

[6] Report of the result of a periodic inspection under Section 10(3) of the Reservoirs Act 1975, dated February 2018

3.5.3 The use of the cross-Haven pipeline also offers the ability to transfer oily water to the Refinery from VPOT, where the oily water can undergo treatment. When this method is used, the density and flow meters at the Refinery record the transfer of all oily water. Once all the oily water has been flushed through, crude oil is transferred into the refining process. As with the road tanker method, this option will require hazardous waste consignment notes to document the transfer of oily water, which will be a waste.

3.5.4 There may be circumstances where VPOT transfer wet crude oil via the cross-Haven pipeline, to the Refinery where the wet crude oil will be stored. By having the storage activity taking place at the Refinery instead of VPOT, the oily water will not be generated at VPOT. This option will mean the crude oil tanks at VPOT will have little water drawn off which may then be sent to the API oil separator system.

3.6 Effluent Limits and Composition

3.6.1 The permit currently allows for the storage of crude oil and management of water from the storage facilities. The permit has been granted on this basis. Given there are no changes to the permitted operations that give rise to emissions to water the permitted releases and associated impacts will also not change. The additional pipework that will be installed to connect the storage tanks to the cross-Haven pipeline will not introduce waste water that will need to be managed and discharged from the site.

3.6.2 A summary of the annual releases to water from the eastern and western release points for years 2000 to 2023 has been placed in Appendix D. The data shows that the activities are within the permit limits for the emissions to water. The inclusion of crude oil storage in Tanks 9, 11 and 12 is not expected to cause the emissions to water to exceed permit limits. When the facility operated as a refinery, crude oil was stored within 11no. tanks. Whereas this variation is seeking to use only 3no. tanks. As set out in section 3.4, the effluent treatment system was design and installed at a time when the VPOT site stored crude oils and was permitted on this basis.

3.6.3 A comparison of the current permit limits for the discharge from the effluent treatment plant emission point C against the typical effluent produced by crude oil storage will be provided within a separate Addendum to this application.

4 MANAGEMENT OF ACTIVITIES

4.1 Environmental Management System

4.1.1 VPOT operate a Commitment to Excellence Management System (CTEMS), which includes an environmental management system. CTEMS establishes a systematic approach to planning, executing, checking and acting to improve Valero's everyday work activities. A guiding principle of CTEMS is to install and operate properly designed and engineered facilities, plant, equipment and to maintain them in a safe condition. A Health, Environment and Safety policy statement is part of the system.

4.1.2 CTEMS is a practical safety and environmental management system centred on how the work is done – a system that connects business-critical requirements to everyday operating policies, programs, procedures and practices. These procedures and policies manage safe work practices within the Pipelines and Terminals network ensuring safe, stable and reliable operations are maintained at all times.

4.1.3 The CTEMS is reviewed at least once every four years or sooner where there is a significant change to the activities, or in the event of recommendations arising from investigations of accidents, incidents, emergencies or other non-compliances.

4.1.4 CTEMS will remain in place but will be subject to updates because of this variation to ensure it adequately covers the proposed changes.

4.2 Operations and Maintenance

4.2.1 The permit already includes for the storage of crude oil. It is not anticipated that the inclusion of additional pipework to connect the storage tanks to the cross-Haven pipeline will present a significant increase in risk to the local environment. The pipework will be designed for the proposed duty and will be subject to commissioning checks to confirm it is leak free prior to being put into use and will also be subject to routine inspections during its operational life.

4.2.2 Documented management systems are in place and form part of the Operating Procedures for VPOT, to ensure that those operations which have the potential to give rise to significant environmental effects are controlled. These include operational procedures for normal, abnormal and emergency operations. The current Operating Procedures will be updated to include the new pipe line connection for transfer of crude oil, oily water and connection into the cross-Haven pipeline.

4.2.3 Planned and preventative maintenance routines have been established to ensure all key plant components which have the potential to affect the environmental performance of the installation remain in good working order. The maintenance routines will be extended to the additional pipework connecting the storage tanks and oily water tanks to the cross-Haven pipeline. Maintenance routines draw on manufacturer's recommendations, modified as appropriate by operational experience during the lifetime of the installation. Maintenance will be carried out by contractors in accordance with the operator's maintenance requirements.

4.3 Competence and Training

4.3.1 Operational staff at the VPOT will be fully trained in the systems and procedures for crude oil storage and transfer to the cross-Haven pipeline and the actions to be taken in the event of an unexpected or abnormal operating condition and/or emergency. This will include, where relevant communication with the Valero Energy Refinery.

4.3.2 All personnel employed at the facility have the appropriate skills and technical capabilities to understand the operation of the process, and their obligations under the terms and conditions of the Permit.

4.3.3 Regular training ensures the facility is managed and operated by a fully trained workforce. Training will not only address normal operations but will also include those actions required in the event of abnormal operations and emergencies.

4.3.4 A training policy and training plans are in place for all staff roles at the facility, these include specific training relevant to the environmental permit and operation of the facility to minimise risk to the environment. Training records for all staff are kept demonstrating competency.

4.4 Accident Management

4.4.1 As part of the management system review prior to commissioning, the accident management plan (AMP) will be reviewed and updated where required. This document identifies foreseeable accidents and assesses the likely risk posed to the environment accounting for the management procedures which are in place. The procedures to follow in the event of an incident will also be reviewed and updated. The updated AMP and relevant procedures will be available for review as required.

4.4.2 Accident risks have been assessed as part of the COMAH Safety Report related Environmental Risk Assessment. This document is in the process of being revised to consider the risks from operating the cross-Haven pipeline, once complete the AMP will be updated.

4.5 Avoidance, Recovery and Disposal of Wastes

4.5.1 Oil removed from the effluent treatment system which includes the East Catch Basin and API oil separator is stored in a Tanks 875 and 876 where it is consolidated and sent to Pembroke Refinery for reprocessing. When the volume reaches a set limit, the oil is sent off site for recovery.

4.5.2 This activity will not change as a result of the variation.

4.5.3 VPOT may on occasions transfer oily water from the facility to the Refinery for further treatment, instead of using the on-site API oil separator system. When this method is used, the transfer of oily water will be regarded as a waste transfer activity.

5 ENVIRONMENTAL RISKS AND IMPACTS

5.1.1 An Environmental Risk Assessment (ERA) for the VPOT facility is in place and considers the environmental risks associated with the permitted activities. The ERA will be revised to consider the environmental risks from transfer pipeline and connection to the cross-Haven pipeline and will set out how those risk will be managed.

5.1.2 Risks associated with the current permitted activities will remain unchanged.

5.2 Emissions to Air

5.2.1 There are no changes to the permitted point source emissions to air as a result of this variation.

5.3 Emissions to Water and Sewer

5.3.1 There are no changes to the permitted emissions to water and sewer as a result of this variation.

5.3.2 The permit already allows for the storage of crude oil and management of water from the storage facilities. Given there are no changes to the permitted operations that give rise to emissions to water the permitted releases and associated impacts will also not change.

5.3.3 Further information and data about the emissions to water has already been provided in Section 3.6.

5.4 Fugitive Emissions to Air, Land and Water

5.4.1 The Environmental Risk Assessment details the potential emissions and management controls in place. The VPOT Environmental Risk Assessment will be revised to include potential risks associated with the additional transfer pipework and connection into the cross-Haven pipeline and the “failure scenarios” set out in the HAZID report. This latter information will be informed by the COMAH Safety Report risk assessment which is in the process of being revised.

5.4.2 The storage of crude oil will take place within Tanks 9, 11 and 12 which have external floating roofs (EFRs) with primary and secondary seals and are Class 1 tanks, suitable for storing crude oil. A recent leak detection and repair (“LDAR”) exercise using infra-red technology has demonstrated the suitability of the pipework for the handling of crude oil with minimal fugitive releases of VOCs.

5.4.3 The VPOT will continue to report on fugitive emissions from the storage tanks as currently required by the permit.

5.5 Odour

5.5.1 The variation will not introduce new sources of odour. The storage of crude oil is already a permitted activity. The storage of crude oil will take place within Tanks 9, 11 and 12 which have external floating roofs (EFRs) with primary and secondary seals minimising the risk of odour releases.

5.5.2 The transfer of crude oil will take place within a fully contained pipeline which also minimises the potential for odour releases.

5.6 Noise and Vibration

5.6.1 The proposed transfer of crude oil from storage tanks via the cross-Haven pipeline will be pumped. The ability to transfer continuously 24/7 all year is being sought. The existing pumps may be modified to perform a reduced duty or new smaller pumps will be installed.

5.6.2 Currently the transfer of material from the VPOT requires the operation of pumps to undertake material transfers and the site will normally have any number of pumps in operation at a given time. The operation of pumps from the existing tanks is therefore not expected to introduce significant noise impacts above those of the permitted activities.

6 BEST AVAILABLE TECHNIQUES ASSESSMENT

6.1.1 This section assesses proposals to transfer of crude oil via a pipeline between Valero Pembrokeshire Oil Terminal (VPOT) and the Valero Energy Pembroke Refinery (Refinery) against the relevant Best Available Techniques (BAT) conclusions set out in the following documents:

- Best Available Techniques Reference Document – Refining of Mineral Oil and Gas, 2015[7]

6.1.2 The associated storage of crude oil within three existing tanks is already permitted and therefore does not represent a change to the permitted activities.

6.1.3 A previous BAT assessment has been produced by RPS in 2016 and provides a review of the activities at that time against the Refining Mineral Oil and Gas BAT conclusions, 2015. That report was in response to a Regulation 61 request by Natural Resources Wales (NRW).

6.1.4 The following BAT conclusions in the 2016 review were addressed:

- BAT 1,
- BAT 3,
- BAT 6,
- BAT 10
- BAT 11
- BAT 12
- BAT 13
- BAT 14
- BAT 17
- BAT 18
- BAT 49
- BAT 50
- BAT 51
- BAT 52

6.1.5 Following the 2016 BAT conclusions review, a number of Improvement Conditions (IC) were incorporated within the VPOT permit by NRW. These IC's have subsequently been addressed by VPOT and the information provided in these responses has also informed this BAT Assessment:

- IC9.24 (January 2022)
- *The operator to provide an overview of the management system and operation of the connection to the Mainline Pipeline Limited;*
- IC9.20 (April 2022)
- *The operator is required to review water emission monitoring methodology outlined in the Refining of Mineral Oil and Gas BAT (BAT 10);*
- IC9.22 and IC9.23 (June 2022)

  The operator is required to undertake a BAT review for utilisation of a vapour recovery system on fixed roof storage tanks (BAT49); and,

[7] Best Available Techniques Reference Document – Refining of Mineral Oil and Gas - REF_BREF_2015.pdf

- *The operator is required to undertake a BAT review for the requirement of a vapour recovery process as outlined in the Crude Oil Refinery BREF (BAT 52) based on the last three years annual throughput.*
- IC9.21 (August 2022)
- *The operator is required to undertake a BAT review for the use of a risk based leak detection and repair (LDAR) programme to identify leaking components and minimising the VOC emissions to air. The review should consider techniques outlined in the Refining of Mineral Oil and Gas BAT (BAT 6 and BAT 18).*

6.1.6 This BAT assessment specifically addresses changes resulting from the applied variation and the relevant BAT previously agreed upon and pertinent to the VPOT. All other aspects of VPOT's operational activities remain unchanged; therefore, the BAT assessment from the 2016 review still applies.

6.1.7 The updated BAT assessment has considered those BAT identified as relevant to the VPOT in the Regulation 61 response, this considered the BAT conclusions listed below:

- BAT 1
- BAT 6
- BAT 10
- BAT 11
- BAT 12
- BAT 13
- BAT 14
- BAT 17
- BAT 18
- BAT 49
- BAT 50
- BAT 51
- BAT 52

6.2 Best Available Techniques for the Refining of Mineral Oil and Gas

Table 6-1: Assessment of relevant BAT for the Refining of Mineral Oil and Gas 2015 for VPOT.

	General BAT conclusions for the refining of mineral oil and gas
	Environmental management systems
BAT 1	In order to improve the overall environmental performance of plants for the refining of mineral oil and gas, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features: i. commitment of the management, including senior management; ii. definition of an environmental policy that includes the continuous improvement for the installation by the management; iii. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; iv. implementation of the procedures paying particular attention to: a. structure and responsibility, b. training, awareness and competence, c. communication, d. employee involvement, e. documentation, f. efficient process control, g. maintenance programmes h. emergency preparedness and response, i. safeguarding compliance with environmental legislation; v. checking performance and taking corrective action, paying particular attention to: a. monitoring and measurement (see also the reference document on the General Principles of Monitoring), b. corrective and preventive action, c. maintenance of records, d. independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; vi. review of the EMS and its continuing suitability, adequacy and effectiveness by senior management; vii. following the development of cleaner technologies;

	viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; **ix. application of sectoral benchmarking on a regular basis.**
Response/ evidence	Valero has a management system in place for the VPOT, covering features i) to ix), as detailed in the sites Commitment to Excellence Management System (CTEMS). The site CTEMS will be updated prior to the use of the existing pipeline for the transfer of crude oil and oily water.
Compliant?	Yes

BAT 6	**BAT is to monitor diffuse VOC emissions to air from the entire site by using all of the following techniques:** **i. sniffing methods associated with correlation curves for key equipment;** **ii. optical gas imaging techniques;** **iii. calculations of chronic emissions based on emissions factors periodically (e.g. once every two years) validated by measurements.** **The screening and quantification of site emissions by periodic campaigns with optical absorption-based techniques, such as differential absorption light detection and ranging (DIAL) or solar occultation flux (SOF) is a useful complementary technique.**
Response/ evidence	Improvement Condition 9.21 confirmed that Valero assess VOC emissions annually and report emissions to NRW in line with Permit condition 9.3. Annual VOCs emissions are used to benchmark year on year performance. A Leak Detection and Repair (LDAR) program is employed to monitor and detect VOC leaks associated with the storage of crude oil in tanks 9, 11 and 12 and subsequent transfer operations at VPOT. Infra-red optical imaging (OGI) cameras will capture and monitoring potential VOC emissions to air. Any new pumps, pressure relief devices, valves, flanges, connectors, and tank seals falling under the specified variation will be subject to the LDAR program. Infra-red OGI cameras will be used to detect leaks on all areas of plant both new and existing. Identified leaks will be reviews and assessed. Any leaks will undergo maintenance and repair then will be revisited during subsequent inspections to evaluate the effectiveness of the repair. Whilst the site has not recently stored crude oil, the Environmental Permit (EPR/BK1341IN) allows for this in essence, there will be no change to the storage of crude oil and the monitoring VOC emissions as a result of the variation. The approach to monitoring set out in the response to the Regulation 61 response and IC9.21 which have been approved by NRW will remain in place.
Compliant?	Yes

Monitoring of emissions to water

BAT 10

BAT is to monitor emissions to water by using the monitoring techniques with at least the frequency given in the table below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

BAT-associated emission levels for direct waste water discharges from the refining of mineral oil and gas and monitoring frequencies associated with BAT(1)

Parameter	Unit	Parameter Unit BAT-AEL (yearly average)	Monitoring (2) frequency and analytical method (standard)
Hydrocarbon oil index (HOI)	mg/l	0.1 – 2.5	Daily EN 9377- 2(3)
Total suspended solids (TSS)	mg/l	5-25	Daily

Daily Chemical oxygen demand (COD)	mg/l	30-125	Daily
BOD_5	mg/l	No BAT-AEL	Weekly
Total nitrogen [5], expressed as N	mg/l	1 – 25[6]	Daily
Lead, expressed as Pb	mg/l	0.005 – 0.030	Quarterly
Cadmium, expressed as Cd	mg/l	0.002 – 0.008	Quarterly
Nickel, expressed as Ni	mg/l	0.005 – 0.100	Quarterly
Mercury expressed as Hg	mg/l	0.0001 – 0.001	Quarterly
Vanadium	mg/l	No BAT-AEL	Quarterly
Phenol Index	mg/l	No BAT-AEL	Monthly EN 14402
Benzene, toluene, ethyl benzene, xylene (BTEX)	mg/l	Benzene: 0.001 – 0.050 No BAT-AEL for T, E, X	Monthly

[1] Not all parameters and sampling frequencies are applicable to effluent from gas refining sites.

[2] Refers to a flow-proportional composite sample taken over a period of 24 hours or, provided that sufficient flow stability is demonstrated, a time-proportional sample.

[3] Moving from the current method to EN 9377-2 may require an adaptation period.

[4] Where on-site correlation is available, COD may be replaced by TOC. The correlation between COD and TOC should be elaborated on a case-by-case basis. TOC monitoring would be the preferred option because it does not rely on the use of very toxic compounds.

[5] Where total-nitrogen is the amount of total Kjeldahl nitrogen (TKN), nitrates and nitrites.

[6] When nitrification/denitrification is used, levels below 15 mg/l can be achieved

Response/ evidence	BAT 10 applies to two-point source emissions to water (C and D relating to the Effluent Treatment Plant) in the Milford Haven Waterway. Each point of discharge has a number of parameters, emission limits and monitoring requirements. The permitted limits for emissions to water were set when the facility was carrying out a refinery activity including the storage of crude oils. Any water build up from the storage of crude oil in tanks 9, 11 and 12 is drawn off at regular intervals and send to the eastern drainage system, which is set up with an API oil separator system or sent off site. The monitoring of emissions to water will remain unchanged under the variation from those previously agreed with NRW in response to the Regulation 61 response.
Compliant?	Yes

	Emissions to Water
BAT 11	**In order to reduce water consumption and the volume of contaminated water, BAT is to use all of the techniques given below.** **i) Water stream integration** **ii) Water and drainage system for segregation of contaminated water streams** **iii) Segregation of non-contaminated water streams (e.g. once-through cooling, rain water)** **iv) Prevention of spillages and leaks**
Response/ evidence	BAT 11 is addressed in the review of BAT conclusions 2016. The proposed variation will not introduce changes to water consumption on the site. VPOT has two-point source emissions to water (C and D relating to the Effluent Treatment Plant) in the Milford Haven Waterway. The storage and transfer of crude oil does not introduce any new emissions to water. Storage tanks 9, 11 and 12 are inspected monthly and maintained. Product levels within tanks are monitored continuously using radar and inventories regularly checked by comparing temperature corrected volumes, any small discrepancies are detected. Leak detection system comprising under tank floor geosynthetic clay liner. Tanks are located within bunded area and provide at least 110% containment. Surface waters are directed to the onsite effluent treatment with additional East Catch Basin prior to being discharged into the Milford Haven. There is to be no change under the variation, therefore the measures that have previously been accepted by NRW for the existing activities will remain appropriate and meet BAT.
Compliant?	Yes
BAT 12	**In order to reduce the emission load of pollutants in the waste water discharge to the receiving water body, BAT is to remove insoluble and soluble polluting substances by using all of the techniques given below:** **i) Removal of insoluble substances by recovering oil,** **ii) Removal of insoluble substances by recovering suspended solids and dispersed oil;** **iii) Removal of soluble substances including biological treatment and clarification.**
Response/ evidence	BAT 12 is addressed in the review of BAT conclusions 2016. Valero operate an API oil separator as part of the on-site water treatment, this will remain in operation following this variation and will continue to handle any water that accumulates within the storage tanks. The API Separator was designed to handle waste waters from former Refinery operations when crude oils storage was being carried out on the site and therefore the installed system is considered appropriate. The installed system which has been accepted to meet BAT 12 by NRW will remain appropriate to meet BAT.

Compliant?	Yes
BAT 13	**When further removal of organic substances or nitrogen is needed, BAT is to use an additional treatment step as described in Section 5.21.2 of the BAT Conclusions Reference Document.** **Removal of insoluble substances by recovering oil.** **These techniques generally include:** **• API Separators (APIs),** **• Corrugated Plate Interceptors (CPIs),** **• Parallel Plate Interceptors (PPIs),** **• Tilted Plate Interceptors (TPIs),** **• Buffer and/or equalisation tanks.** **Removal of insoluble substances by recovering suspended solid and dispersed oil.** **These techniques generally include:** **• Dissolved Gas Flotation (DGF),** **• Induced Gas Flotation (IGF),** **• Sand Filtration.** **Removal of soluble substances including biological treatment and clarification** **Biological treatment techniques may include:** **• Fixed bed systems,** **• Suspended bed systems.** **One of the most commonly used suspended bed system in refineries WWTP is the activated sludge process. Fixed bed systems may include a biofilter or trickling filter.** **Additional treatment step** **A specific wastewater treatment intended to complement the previous treatment steps e.g. for further reducing nitrogen or carbon compounds. Generally used where specific local requirements for water preservation exist.**
Response/ evidence	BAT 13 is addressed in the review of BAT conclusions 2016. API Separator is a feature part of the on-site water treatment and has been accepted by NRW as BAT for a facility permitted to store crude oil.

	There is to be no change under the variation.
Compliant?	Yes
	Waste generation and management
BAT 14	**In order to prevent or, where that is not practicable, to reduce waste generation, BAT is to adopt and implement a waste management plan that, in order of priority, ensures that waste is prepared for reuse, recycling, recovery or disposal.**
Response/ evidence	BAT 14 is addressed in the review of BAT conclusions 2016. The changes to operations at VPOT are limited to the transfer of crude oil using the pipeline under the Milford Haven to the Valero Energy Refinery from existing storage tanks 9, 11 and 12. Any wastewater build up from tanks is to be drawn off and send to the eastern drainage system. The site waste minimisation plan will be updated prior to the use of the existing pipeline for the storage and transfer of crude oil and will be reviewed based on annual performance.
Compliant?	Yes
	Noise
BAT 17	**In order to prevent or reduce noise, BAT is to use one or a combination of the techniques given below:** **i. make an environmental noise assessment and formulate a noise management plan as appropriate to the local environment;** **ii. enclose noisy equipment/operation in a separate structure/unit;** **iii. use embankments to screen the source of noise;** **iv. use noise protection walls.**
Response/ evidence	BAT 17 is addressed in the review of BAT conclusions from 2016. VPOT currently stores fuel and oil in tanks including tanks 9, 11 and 12 with associated pumps for transfers. The day-to-day storage operations are not deemed to pose a significant noise risk, considering the site's location and the nature of activities. General maintenance occurs at the site and will include maintenance of pumps. The proposed transfer of crude oil from storage tanks via the cross-Haven pipeline will be pumped. The ability to transfer continuously 24/7 all year is being sought. The existing pumps may be modified to perform a reduced duty or new smaller pumps will be installed. Currently the transfer of material from the VPOT requires the operation of pumps to undertake material transfers and the site will normally have any number of pumps in operation at a given time. The operation of pumps from the existing tanks is therefore not expected to introduce significant noise impacts above those of the permitted activities.

Compliant? Yes

BAT conclusions for integrated refinery management

BAT 18

In order to prevent or reduce diffuse VOC emissions, BAT is to apply the techniques given below;

Technique	Description	Applicability
Techniques related to plant design.	i. limiting the number of potential emission sources ii. maximising inherent process containment features iii. selecting high integrity equipment iv. facilitating monitoring and maintenance activities by ensuring access to potentially leaking components.	Applicability may be limited for existing units.
Techniques related to plant installation and commissioning.	i. well-defined procedures for construction and assembly ii. robust commissioning and hand-over procedures to ensure that the plant is installed in line with the design requirements.	Applicability may be limited for existing units.
Techniques related to plant operation.	Use of a risk-based leak detection and repair (LDAR) programme in order to identify leaking components, and to repair these leaks.	Generally applicable.

Response/ evidence

Valero carried out a LDAR program and to identify VOC leaks from equipment in Q4 2022. LDAR is deemed most suitable for VPOT's operation. The following leak detection systems will be installed:

- Density Signal to Leak Detection System
- Temperature Signal to Leak Detection System
- Pressure Signal to Leak Detection System
- Flow Indication to Leak Detection System

Operating procedures will be updated to incorporate the requirements of BAT 18, including the use of these detailed detection systems. Following implementation VPOT will be compliant with BAT 18. These measures will be in place before VPOT begins the storage and transferring of crude oil from tanks 9, 11 and 12, and oily water from Tanks 875 and 876 via the cross-Haven Pipeline to minimise VOC emissions.

Compliant? Yes, once agreed measures are in place.

BAT conclusions for the storage and handling processes

BAT 49 In order to reduce VOC emissions to air from the storage of volatile liquid hydrocarbon compounds, BAT is to use floating roof storage tanks equipped with high efficiency seals or a fixed roof tank connected to a vapour recovery system.

Response/ evidence	The storage tanks at the VPOT hold Highly Flammable products in Class I tanks fitted with Internal Floating Roof or in tanks with an External Floating Roof equipped with high efficiently primary plus secondary seals. The proposed storage arrangements have been accepted by NRW as BAT. There it to be no change under the variation.
Compliant?	Yes

BAT 50

In order to reduce VOC emissions to air from the storage of volatile liquid hydrocarbon compounds, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability
i. Manual crude oil tank cleaning	Oil tank cleaning is performed by workers entering the tank and removing sludge manually.	Generally applicable.
ii. Use of a closed-loop system	For internal inspections, tanks have to be periodically emptied, cleaned and rendered gas-free. This cleaning include dissolving the tank bottom. Closed-loop systems that can be combined with end-of-pipe mobile abatement techniques prevent or reduce VOC emissions	The applicability may be limited by e.g. the type of residues, tank roof construction or tank materials.

Response/ evidence	BAT 50 is addressed in the review of BAT conclusions from 2016. Manual crude oil tank cleaning will be carried out as per technique (i) above in accordance with the Tank Inspection Strategy and alongside with procedures outlined in the sites EMS. There is to be no change as a result of this variation.
Compliant?	Yes

BAT 51

In order to prevent or reduce emissions to soil and groundwater from the storage of liquid hydrocarbon compounds, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability
i. Maintenance programme including corrosion monitoring, prevention and control	A management system including leak detection and operational controls to prevent overfilling, inventory control and risk-based inspection procedures on tanks at intervals to prove their integrity, and maintenance to improve tank containment. It also includes a system response to spill consequences to act before spills can reach the groundwater. To be especially reinforced during maintenance periods.	Generally applicable
ii. Double bottomed tanks	A second impervious bottom that provides a measure of protection against releases from the first material	Generally applicable for new tanks and after overhaul of

		existing tanks (1)
iii. Impervious membrane liners	A continuous leak barrier under the entire bottom surface of the tank.	Generally applicable for new tanks and after an overhaul of existing tanks (1)
iv. Sufficient tank farm bund containment	A tank farm bund is designed to contain large spills potentially caused by a shell rupture or overfilling (for both environmental and safety reasons). Size and associated building rules are generally defined by local regulations.	Generally applicable
(1) Techniques ii and iii may not be generally applicable where tanks are dedicated to products that require heat for liquid handling (e.g. bitumen), and where no leak is likely because of solidification.		

Response/ evidence

BAT 51 is addressed in the review of BAT conclusions from 2016.

At VPOT, the tanks feature secondary containment with a volume capacity of 110% and the floors are equipped with geosynthetic clay liners for tertiary containment. All storage tanks have fully automatic Remotely Operated Shut Off Valves (ROSOV) and SIL-rated high-level alarms to prevent tank overfill and product loss. Regular inspections of tanks and seals occur every five to ten years. Since 2005, tanks have been installed with sensitive tank gauging equipment. There is to be no change with the new directly associated activity of the storage of crude oil in tanks 9, 11 and 12.

Compliant? Yes

Bat 52

In order to prevent or reduce VOC emissions to air from loading and unloading operations of volatile liquid hydrocarbon compounds, BAT is to use one or a combination of the techniques given below to achieve a recovery rate of at least 95 %.

Technique	Description	Applicability (1)
Vapour recovery by: i. Condensation ii. Absorption iii. Adsorption iv. Membrane separation v. Hybrid systems	See Section 5.20.6	Generally applicable to loading/unloading operations where annual throughput is >5000 m3/yr. Not applicable to loading/unloading operations for sea-going vessels with an annual throughput <1 million m^3/yr.
(1) A vapour destruction unit (e.g. by incineration) may be substituted for a vapour recovery unit, if vapour recovery is unsafe or technically impossible because of the volume of return vapour.		

Response/ evidence

In response to Improvement Condition 9.23, BAT 52 is not applicable to the loading / unloading operations for sea going vessels with an annual throughput of less than 1 million m^3/year. Gasoline throughput since VPOT acquisition has averaged 0.55 million m^3/year (2019 – 2023). No other Class 1 products have been loaded or unloaded at VPOT.

Compliant?	N/A

6.2.1 BAT Conclusions not mentioned in the table above have been discounted as they do not apply to the current variation due to their lack of relevance to the specific processes and activities covered by the variation. Consequently, these techniques have been excluded from consideration in the BAT assessment.

6.2.2 Based on a review of all the available information, the VPOT is compliant (or will be following completion of improvements to the agreed timescales with NRW) with all relevant requirements of the above applicable BAT conclusions.

7 CHANGES TO PERMITTED ACTIVITIES APPLICATION SUMMARY

7.1 Changes to Existing Permitted Activities

7.1.1 The changes subject to this variation application require the addition of a new DAA for the transfer of crude oil via the cross-Haven pipeline. This will require an update to Table S1.1 (Activities) within the permit, as detailed in Table 7-1 and Table 7-2 below.

Table 7-1 – Current Table S1.1 - Activities

Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
S1.2 A1 (e)	The loading, unloading or other handling of, the storage of, or the physical, chemical or thermal treatment of crude oil.	Receipt and storage and the dispatch of crude including: (i) Jetty operations (ii) Crude storage
Directly Associated Activity		
Connection to mainline pipeline limited pumping station located north of VPOT.	Connection to the Mainline Pipeline	

Table 7-2 – Proposed Table S1.1 - Activities

Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
S1.2 A1 (e)	The loading, unloading or other handling of, the storage of, or the physical, chemical or thermal treatment of crude oil.	Receipt and storage and the dispatch of crude including: (i) Jetty operations (ii) Crude storage
Directly Associated Activity		
Connection to mainline pipeline limited pumping station located north of VPOT.	Connection to the Mainline Pipeline	
Effluent treatment system	Use of an atmospheric plate interface (API) system to separate oil from effluent in the eastern effluent drainage system	
Connection to cross-Haven Pipeline located in south-east corner of VPOT.	Connection to the cross-Haven Pipeline	Transfer pipework up to and including 'Wear Point Isolation Valve' for the cross-Haven pipeline

Appendices

Appendix A

Application Forms

Appendix B

Site Plans

Appendix C

Pre-application discussions

Appendix D

Effluent Treatment Plant