This Report has been cleared for submission to the Board by Programme Manager, Mr David Flynn

Signed: Dorota Richards *Date: 26th April 2018*

OFFICE OF ENVIRONMENTAL SUSTAINABILITY

INSPECTOR'S REPORT ON AN INDUSTRIAL EMISSIONS LICENCE REVIEW, LICENCE REGISTER NUMBER P0266-03

TO: DIRECTORS

FROM: Ann Marie Donlon	**DATE: 26 April 2018**
Licensee:	Irving Oil Whitegate Refinery Limited
CRO number:	16576 (status: normal)
Location:	Whitegate, Midleton, Co. Cork
Section 87(1)b notice sent:	12th July 2017
BATC Review form received:	12th September 2017
Classes of activity (under EPA Act 1992 as amended):	9.3 The operation of a mineral oil refinery
Category of activity under IED (2010/75/EU):	1.2 Refining of mineral oil and gas
Proposed additional class of activity (under EPA Act 1992 as amended):	2.1 Combustion of fuels in installations with a total rated thermal input of 50MW or more
Category of activity under IED (2010/75/EU):	1.1 Combustion of fuels in installations with a total rated thermal input of 50MW or more
Main CID:	Commission Implementing Decision of 09 October 2014 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the refining of mineral oil and gas (2014/738/EU).
Additional information received:	Yes (10/01/2018, 17/01/2018, 13/04/2018)
No of submissions received:	None
Site visit: 10/11/2017	Site notice check: not applicable

1. Activity description

The Whitegate oil refinery is located on the eastern shore of Cork Harbour and occupies an area of approximately 100 hectares. Facilities include process units, crude oil storage tanks, intermediate and finished product storage tanks, blending facilities, road loading terminals, effluent treatment, firefighting facilities, workshops, warehouses and site offices and marine terminal.

The main process units at the installation are the desalter, pipestill, powerformer, isomerisation unit, hydrofiner unit and an amine sulphuric acid plant. Catalysts are used in the powerformer and isomerisation unit. The process is continuous and each unit operation is interlinked.

The licensee changed name from Conocophilips Whitegate Refinery Limited to Philips 66 Whitegate Refinery Limited on 10.05.2012 and to Irving Oil Whitegate Refinery Limited on the 23.09.2016.

2. Scope of Review

On the 12 July 2017, the Environmental Protection Agency initiated a review of the IE licence (Reg No. P0266-02) held by Irving Oil Whitegate Refinery Limited. This review is for the purposes of updating the licence to ensure compliance with the requirements of the European Commission Implementing Decision on BAT conclusions for refining of mineral oil and gas (2014/738/EU) (Refineries BATC) and applicable BAT conclusions.

Other BAT Conclusions or conclusions on BAT considered relevant to the installation are as follows:

- European Commission Implementing Decision on BAT conclusions for common waste water in the chemical sector (2016/902/EU) (CWW BATC).
- BAT reference document (BREF) on Emissions from storage (07.2006).
- BAT reference document (BREF) on Energy Efficiency (02.2009).
- BAT reference document (BREF) on Industrial cooling systems (12.2001).

This review relates to the use of BAT at the installation. The predicted environmental impact of emissions is as assessed under the current licence (P0266-02).

3. Licence History

Licence	Details	Date
P0266-01	The refining of petroleum	17/01/2000
P0266-02	To incorporate the operation of an amine sulphuric acid plant at the installation	30/05/2012
P0266-02 IE amendment	IE Amendment to bring it into conformity with the Industrial Emissions Directive (IED) (2010/75/EC).	19/12/2013

4. Compliance and Complaints Record

In 2017, there were four odour/ air quality complaints and eight incidents where there was a breach of an ELV on emissions to water or air. Twelve non-compliances were issued in relation to ELV exceedance, nuisance and bunding during 2017. These issues are addressed below in the respective sections.

5. Activities and BAT

For the purposes of clarity, the following table summarises the activities carried out at the installation, the related class and the applicable BAT Conclusions and/or reference document.

EPA Act 1992 as amended - Class of Activity	Activity	BAT Conclusions / reference document
9.3	Desalting, catalytic reforming process, isomerisation process, distillation process, products treatment process, flares	Refineries BATC, CWW BATC, BREF on Energy Efficiency
9.3	Storage and handling process	Refineries BATC, BREF on emissions from storage
9.3	Combustion units burning refinery fuels (furnaces, heaters – 220 MW)	Refineries BATC, BREF on Energy Efficiency
9.3	Amine Sulphuric Acid plant	Refineries BATC
9.3	Waste water treatment plant	Refineries BATC, CWW BATC
2.1	CHP burning refinery fuels (20.37 MW)	Refineries BATC
2.1	Combustion units burning natural gas (58 MW)	Medium combustion plant directive

Utility combustion units – boilers, compressors, CHP

Where the combustion of fuels at an installation exceeds a total thermal input of 50MW then class 2.1 of the EPA Act 1992 as amended applies (*combustion of fuels in installations with a total rated thermal input of 50 MW or more*). This class does not apply to process furnaces and heaters covered by class 9.3. However, the boilers, CHP and compressors that supply heat and power to an activity fall within the scope of class 2.1 when the total rated thermal input exceeds 50MW.

This class has not been applied heretofore to this installation.

The licensee does not consider that class 2.1 applies and argue that none of the units are greater than 50MW having regard to the definition of a combustion plant in the LCP BATC.

I consider that neither Chapter III nor LCP BATC apply to these combustion units as none of the individual combustion units exceed 50 MW. Class 2.1 covers the general activity of the combustion of fuels in installations with a total rated thermal input of 50MW or more, whereas both Chapter III and LCP BATC is specific to combustion plant with a total rated thermal input of 50MW or more. There are at least 15 IE licences with Class 2.1 as a minor activity (in addition to a main) and six of these come within

the scope of Chapter III of the IED. It can be concluded that class 2.1 is relevant to this installation due to the cumulative thermal input of CHP, boilers and compressors as these combustion units are utilities; supplying heat and power. The Recommended Determination (RD) applies class 2.1 under *Part I Schedule of Activities Licensed* for the purposes of clarity and consistency.

The Production of sulphuric acid

In the granting of the licence register number P0266-02, it was determined that the production of sulphuric acid as a by-product did not require a new class of activity. This position is maintained.

6. Best Available Techniques

Section 86A(3) of the EPA Act 1992 as amended, requires that the Agency shall apply BAT conclusions as the reference for attaching one or more conditions to an Industrial Emissions (IE) licence, or revised IE licence.

With respect to the BAT Conclusions for refining of mineral oil (2014/738/EU), the licensee identified the applicable BATs to their installation (BAT No. 1, 2 etc) and provided information on the techniques employed or to be employed. The licensee did not seek a derogation from the BAT associated emission level (Article 15(4) of the IED).

This installation is an existing installation and therefore techniques are those that apply generally to the sector. The RD specifies that the licensee must have regard to BAT Conclusions for new plant when choosing /or designing new infrastructure.

The following table sets out the applicable BAT No.s, the specific techniques and the reference condition in the RD. Further information is given in the sections on emissions to air, water etc below. Where practicable, BAT techniques are specified in the schedules to the RD.

Table 1: Applicable BAT No.'s from Refineries BATC, the specific techniques employed or will be employed and condition in licence

BAT Conclusions for refining of mineral oil (2014/738/EU)		
BAT No.	**BAT employed**	**Condition/ schedule**
1	Environmental management system (EMS) is in place	Condition 2
2	To use energy efficiently, the following techniques are or will be used; Pinch Analysis and Heat Integration have been incorporated into the design. Automated controlled combustion, Furnace/boiler efficiency and steam consumption is monitored and managed. Energy benchmark activities will be used. Operate a CHP plant.	Sch C.1. Use Energy Efficiently
3	*No dusty materials stored on-site*	Not relevant
4	Monitoring frequencies and techniques updated	Schedule B

BAT Conclusions for refining of mineral oil (2014/738/EU)		
BAT No.	**BAT employed**	**Condition/ schedule**
5	Monitoring of O_2 content in flue gas is carried out and monitoring of N and S content in fuel will be carried out	Schedule B.1
6	Diffuse VOC emissions will be monitored using specified techniques.	Schedule B.1
7	To reduce emissions to air, the ASA plant is operated at >96% uptime and is optimised to maximise sulphuric acid production for sale (i.e. high availability and at optimal capacity)	Conditions 5.5, 5.6 and 6.17
8	To reduce ammonia emissions from the SCR, an ELV for ammonia is applied.	Schedule B.1
9	To reduce emissions to air, off-gases from the sour water stripper is routed to the Wet Sulphuric acid section of the Amine Sulphuric acid (ASA) plant for acid gas treatment.	Schedule B.1
10	EN standards and monitoring frequencies for emissions to water updated	Schedule B
11	To reduce water consumption and emissions to water, practices in the prevention of spillages and leaks are employed.	Conditions 3.7, 3.10 and 6.8
12	Emissions to water are reduced using the following techniques: Recover oil by using an API separator Remove dispersed oil and solids by using dissolved air flotation and sand filters Remove soluble substances by using biological treatment and clarification by sand filters. ELVs are set based on Table 3.	Schedule B.2
13	*Further removal of organic substances and nitrogen not identified as been needed.*	Not relevant
14	Waste management system is in place and a waste management plan will be in place.	Schedule C.2. and Condition 8
15	To reduce sludge volumes, sludge is dewatered by centrifuge and oily sludge from API is reprocessed	Schedules B.2 and C.2
16	Spent catalyst is recovered off-site	Schedule C.2.
17	To reduce noise, annual noise monitoring is undertaken to demonstrate compliance with limits and high pressure relief valves are enclosed where practicable	Schedule B.4
18	Formalised LDAR programme to be put in place by Q4 2018	Schedule B.1.4a
19, 20, 21, 22, 23, 24, 25, 26, 27	No hydrofluoric acid alkylation, sulphuric acid alkylation, base oil production, bitumen production, catalytic cracking processes undertaken at this installation.	Not relevant
28	Per-Chloro Ethylene (PERC) is the catalyst promoter used in the cyclic reforming process.	Condition 2 and Schedule B.1.2

BAT Conclusions for refining of mineral oil (2014/738/EU)		
BAT No.	**BAT employed**	**Condition/ schedule**
	The Reformer unit off gases are passed through a chloride guard drum prior to the gases being sent to the refinery fuel system.	
29, 30, 31, 32	No coking process undertaken	Not relevant
33	Water consumption and emissions reduced by recycling water in the desalter, use of a flare drum to separate desalter waste.	Schedule B.2
34	NO_x emissions from combustion plants are reduced by using a combination of listed techniques including using gas, staged combustion, optimisation, flue gas circulation The licensee has opted for a total ELV for NO_x emissions based on the integrated emissions management technique in BAT 57, an alternative to the BAT-AELs in tables 9, 10 & 11 of BAT 34	Schedule B.1.2
35	Dust emissions from combustion plants are reduced by using some of the same techniques used for NOx reduction. BAT-AEL for dust do not apply to this installation as there is no multi -fuel combustion.	Schedule B.1.2
36	SO_x emissions from combustion plants are reduced by using gas and treating the refinery fuel gas to remove H_2S. ELV set for SO_x of 35 mg/m^3 in Schedule B.1.2	Schedule B.1.2 and B.1.3
37	CO emissions are reduced by using control technology and trained operatives.	Schedule B.1.2
38, 39	No etherification process undertaken	Not relevant
40	PERC use is optimised by monitoring the caustic activity is tested daily to ensure no over/undercharging of PERC is happening	Schedule B.1.2
41, 42, 43	No natural gas plant in place	Not relevant
44	Installation does not operate vacuum distillation	Not relevant
45	To reduce water pollution sour water from the distillation process is routed to the stripping unit.	Schedule B.2
46	To reduce emission to air from distillation process off-gases are treated by acid gas removal.	Schedule B.1.3
47	To reduce emission to air, off-gases from hydrotreatment process are treated by ASA plant. Waste water from the hydrotreatment process is routed to the sour water stripper where off-gases are routed to the ASA plant.	Schedule B.1.3
48	To reduce waste and waste water generation, caustic washing solution is recycled until spent. Waste water from the hydrotreatment process is directed to the waste water treatment plant.	Schedule B.2

BAT Conclusions for refining of mineral oil (2014/738/EU)		
BAT No.	**BAT employed**	**Condition/ schedule**
49	To reduce VOC emissions from crude, intermediate and product storage tanks are fitted with floating roofs and high efficiency seals	Schedule B.1.4a
50	To reduce VOC emissions from storage tanks, the maintenance programme includes manual cleaning and closed -loop system cleaning	Schedule B.1.4a
51	To prevent or reduce VOC emissions to ground maintenance programme includes corrosion monitoring, prevention and control and bunded.	Schedule B.C.3
52	To prevent VOC emissions from road loading, a vapour recovery unit is in operation. An ELV is set for NMVOC Not applicable to sea going vessels due to throughput	Schedule B
53	Visbreaking process is not undertaken	Not relevant
54	To reduce sulphur emissions, off-gases are treated and sulphuric acid is recovered in Amine & Sulphuric acid plant. BAT associated performance levels are specified.	Schedule B performance levels and techniques
55	Flares are used for safety reasons and non-routine operations	Schedule B.1.5
56	The plant is managed to reduce emissions from flares and flare events are monitored and reported on	Schedule B.1.5
57	To achieve an overall reduction of NOx emissions from combustion plants, the licensee has opted for a total ELV for NOx emissions based on the integrated emissions management technique (bubble approach) instead of the BAT-AELs in tables 9, 10 & 11 BAT 34.	Schedule B.1.2
58	An integrated emission management technique for SOx is not necessary as BAT 36 and BAT 54 can be complied with	Not relevant

In the Scope section of the Refineries BATC, the CWW BATC is listed as a document that may be relevant for the activities covered by the Refineries BATC. Having regard to the topics covered by the Refineries BATC and the emissions from the installation, only four BAT conclusions from the CWW BATC were identified as applicable (table 2). Odour is an issue for the installation but it is not covered by the Refineries BATC. The parameters Total phosphorus, copper and zinc are listed in the current licence as emissions to water but these parameters are not covered by the Refineries BATC. The CWW BATC covers these emissions.

Table 2: Applicable BAT No.'s from CWW BATC, the specific techniques employed or will be employed and condition in licence

BAT Conclusions for common waste water (2016/902/EU)		
BAT No.	**BAT employed**	**Condition/ schedule**
4	For relevant parameters, monitoring will be in accordance with specified EN standards	Schedule B.2
6	Monitor odour emissions from relevant sources	Schedule B.1.6
12	BAT AELs for copper, zinc, total phosphorus are applicable	Schedule B.2
20	Odour management plan to be implemented	Schedule B.1.6

The BREF on Emissions from storage does not define 'volatile' and for the time being it is taken as the definition in the Refineries BATC. With regard to the BREF documents only those applicable techniques, not already covered by the Refineries BATC and the CWW BATC, are considered in the following table:

Table 3: BREFS, techniques and provisions in the Recommended Determination

BAT Reference Document (BREFs)	**Key BAT employed at this installation**	**Condition/ Schedule in RD**
Energy Efficiency 02.2009	In addition to the above; a new energy engineer post to establish energy management system, annual energy audits, cleaning of heat exchangers, optimise lighting system are planned	Condition 2, 3, 7, Sch C.1 Energy use
Emissions from Storage 07.2006	**Emissions from storage**: maintenance programme, over-ground atmospheric grey tanks, dedicated systems, pressure relief valves on certain fixed roof tanks required **Accident prevention measures in place**: safety management system, high level alarms, bunding, dangerous substances chemical store, fire safety measures **Transfer and handling**: maintenance programme, BAT for piping, bolted flange connections, valves, pumps and seal types, compressors, sampling ports applied.	Condition 2, 3, 6 Sch B and C
Industrial Cooling Systems 12.2001	Small cooling requirement on-site: closed circuit air cooled wet system in place.	Covered by energy efficiency requirements and Condition 7.

I consider that the applicable Conclusions on BAT are addressed through the technologies and techniques as described in the review documentation, as well as the conditions specified in the RD.

I have considered the information and incorporated the BAT Conclusions into the RD.

In the schedules to the RD, requirements relating to emissions, monitoring and control techniques are brought together for each emission point or type of emission. The RD specifies new conditions requiring the licensee to implement control and monitoring

techniques and to operate the installation to ensure that the specified performance rates are achieved.

In the conditions and schedules to the RD, new requirements relating to energy use, waste management and accident prevention measures are set out.

7. Emissions to Air

This installation has eighteen combustion units for energy production (furnaces, heaters, boilers, compressors and CHP).

Heavy fuel oil is no longer used as a fuel on-site and reference to it and associated emission limit values in the current licence conditions and schedules have not been carried forward into the Recommended Determination (RD). The type of fuel used in the boilers/ furnaces is specified in the schedules to the licence and therefore it is no longer necessary to include the current condition (Condition 3.16 of licence register No. P0266-02) on fuel use.

7.1 Combustion units using natural gas

There are three boilers and three compressors operating on natural gas (58MW rated thermal input in total). These combustion units are utilities proving a consistent and steady energy supply and do not fall within the scope of Chapter III or LCP BATC as the individual combustion plants do not exceed the rated thermal input of 50MW and the units cannot be aggregated.

The boilers and compressors firing on natural gas fall within the scope of the Medium Combustion Plant Directive. The requirements of this Directive have been applied to the RD. Nitrogen oxide levels are required to be reduced from 1st January 2025 in the case of the boilers and from 1st January 2030 in relation to compressors. Refinery fuel gas is not used in these boilers and compressors, and reference to it is removed in the RD.

Please note that emission point reference A1-2 is the stack emission point for a combustion unit that can operate in two modes; CHP and boiler. When this unit operates in boiler mode, it only fires on natural gas and is covered by the Medium Combustion Plant Directive. The RD specifies ELVs for both modes of operation.

7.2 Combustion units using refinery fuel gas

All combustion units fired on refinery fuel gas are covered by the Refineries BATC which has no threshold on rated thermal input. For the purposes of clarity, neither Chapter III of the IED nor the LCP BATC applies to combustion plants firing on refinery fuel gas.

The CHP/boiler combustion unit is a utility providing heat and power to process activities. The CHP is fired on refinery fuel gas or natural gas (20.37 MW) but the boiler mode is only operated on natural gas (13 MW rated thermal input). The RD specifies limits for each mode of operation as the MCP Directive applies to the boiler mode and the Refineries BATC applies to CHP mode.

Furnaces and heaters are used in the various processes such as reforming and distillation. These furnaces and heaters burn refinery fuel gas (215 MW in total rated thermal input) and are integral to the refinery processes and therefore are part of class 9.3 activity. No individual furnace or heater exceed the rated thermal input of 50 MW.

The RD requires continuous indirect monitoring of SO_x and NO_x in line with BAT 4 for all of these emission points. The indirect monitoring is supported by a requirement

for a direct measurement annually. Estimation of emission concentrations in flue gas by indirect monitoring is through a combination of measurements by surrogate parameters, calculations and periodic measurements. The RD requires that the licensee maintains a description of the methodology used for indirect monitoring to the satisfaction of the Agency.

The RD now includes annual monitoring for dust and monitoring for Polychlorinated dibenzodioxins (PCDD/F) from units burning RFG from the reformer. The Licensee states that monitoring for dust and dioxins will require significant modification to the emission points that can only be done during shut down and for this reason, monitoring is required from October 2019.

In order to reduce emissions to air of NO_x, SO_x and dust from combustion units, control techniques and monitoring of process parameters are specified in the schedules to the RD in line with BAT.

Emission Limit Values

The RD carries forward the existing limits for SO_x and CO as these are in line with the BAT-AEL.

The RD carries forward the existing NO_x limit of 450 mg/m^3 to ensure that there will be no air quality issues. The RD also specifies a total ELV for NO_x for the units concerned based on the integrated emissions management technique (bubble approach) in line with BAT 57.

The licensee proposes to avail of integrated emissions management technique (BAT 57) as an alternative to BAT 34 for the reduction of NO_x emissions from combustion units. The integrated emission management technique applies to the following combustion units set out in the table below which are all existing units burning refinery fuel gas.

This table contains the information considered in the determination of the installation emission value as required under the Commission Implementing Decision establishing the type, format and frequency of information to be made available by Member States on integrated emission techniques applied in mineral oil and gas refineries pursuant to Directive 2010/75/EU (2014/768/EU):

Table 4: Combustion units under the integrated emission management technique

Combustion unit reference	**Rated thermal input (as per the GHG permit) MW**	**Measured Emission conc g/m^3**	**BAT-AEL that would be achieved mg/m^3**	**Flue gas flow rates provided by the licensee (Nm^3/hr)**	**Ref O_2**	**Mass flow mg/hr**
A1-2 (CHP mode)	20.37	192	120	20,652	15	2,478,240
A2-1 F-401 Furnace Stack	46.1	166	150	44,844	3	6,726,600
A2-2 F-402 Furnace Stack	25.03	174	150	25,986	3	3,897,900
A2-3 F-501 Furnace Stack (hydrotreater)	11.54	232	150	1,222	3	183,300

A2-4 F-204 Powerformer stabiliser reboiler heater	10.2	132	150	4,804	3	720,600
A2-5 F-201 Powerformer pre-heat heater	31.94	250	150	14,629	3	2,194,350
A2-6 F-202Bx/Cx Powerformer re-heat heater	11.96	210	150	6,838	3	1,025,700
A2-7 F-202 AN Powerformer pre-heat heater	14.14	155	150	8,749	3	1,312,350
A2-8 F-206/207 Naphtha Hydrofiner/Debutaniser reboiler heater	29.98	110	150	13,050	3	1,957,500
A2-9 F-203: Powerformer Regen heater	5.25	129	150	383	3	57,450
A2-10 F-801/802 Hydrotreater preheat heater	22.75	171	150	18,431	3	2,764,650
A2-11 F-901 Furnace Stack	12.75	131	150	5,124	3	768,600
Total				164,712		24,087,240
Weighted average ELV						146 mg/m^3

The emission limit value was calculated using the following formula (extracted from the Refineries BATC):

This BAT-AEL is expressed by the following formula:

$$\frac{\Sigma\left[(\text{flue gas flow rate of the unit concerned}) \times (NO_x \text{ concentration that would be achieved for that unit})\right]}{\Sigma(\text{flue gas flow rate of all units concerned})}$$

None of the combustion units are monitored continuously for NO_x by direct measurement. The emission concentration is the highest value measured in the last four years. This highest value was compared with the individual BAT-AEL under BAT 34 and it is considered that the upper end of the BAT-AEL is the relevant concentration that would be achieved for each unit concerned.

The total emission limit value for NO_x is calculated from the flowrate and the BAT-AEL that would be achieved by the unit as detailed above. The licensee determines flue gas flowrate by calculation from fuel use (composition and quantity) and excess oxygen.

The RD requires continuous indirect monitoring and specifies the format of records to be kept. The interpretation condition of the RD includes requirements for the assessment of compliance against the total emission limit value (a weighted monthly average across all units concerned).

7.3 Acid gas removal and sulphur recovery (Amine and Sulphuric acid plant)

The waste gas sulphur treatment unit at this installation is called the Amine and Sulphuric acid plant (ASA plant).

Hydrogen sulphide is separated from refinery fuel gas (RFG) and off-gases from processes using amine treatment. The amine hydrogen sulphide solution is steam stripped to remove hydrogen sulphide gas and regenerate the amine solution for re-use.

This acid gas stream and sour water stripper off-gases are then burnt to form SO_2. The waste gases are treated by selective catalytic reduction (SCR) to reduce NO_x emissions and SO_2 is then converted by catalytic processes to commercial grade sulphuric acid. This process is known as the wet sulphuric acid (WSA). The WSA has a sulphur recovery rate of > 99%. The Amine and Sulphuric Acid (ASA) Plant is a combination of the amine treatment step, combustion, SCR and WSA. It is reported in the BREF document on Refineries that any ammonia slip from SCR is destroyed in the SO_2/SO_3 oxidiser and that a 95% NO_x reduction can be achieved.

As an SCR is part of the ASA plant, the RD includes a new limit for ammonia emissions of 10 mg/m^3 based on vendors specification and quarterly monitoring. Although BAT 4 requires continuous monitoring of ammonia from an SCR unit, the licensee sought non-continuous monitoring at a quarterly frequency. They reasoned it is a small unit (< 5 MW) and that non-continuous monitoring is allowed under the LCP BATC. Excess ammonia from the SCR must pass through the SO_2 converter before exiting to atmosphere and may be removed by the converter before exit. It is considered reasonable in these circumstances to specify a monitoring frequency of quarterly. The RD requires continuous monitoring of SO_x by indirect measurement in line with BAT 4.

There is no BAT-AEL for the ASA plant in the refineries BATC but there are BAT associated environmental performance levels. The performance of the ASA plant is controlled by the ELVs set for emissions from combustion plants operating on refinery fuel gas i.e. 35 mg/m^3 and a sulphur recovery performance limit of ≥99% on the ASA plant.

The RD carries forward the existing ELVs in relation to NO_x, SO_x, and acid mist.

7.4 VOC Emissions

The RD now specifies requirements in relation to VOC emissions from the tank farm, transfer lines and road loading operations.

The RD requires the monitoring of diffuse VOC emissions and the preparation and implementation of a risk based leak detection and repair programme in line with BAT 6 and 18. All but two tanks (containing volatile liquid hydrocarbons) have floating roofs and seals and are compliant. The licensee has requested an additional six- month period to achieve compliance with the two remaining tanks and this is provided for in the RD. The RD requires the installation of internal floating roofs or vapour treatment on the two non-compliant tanks (in line with Refineries BATC or BREF on emissions from storage) by October 2019 to allow for any modifications necessary during shutdown.

In line with the requirements of the BREF document on Emissions from storage the RD requires fixed roof tanks for MDFI and kerosene marker be fitted with pressure relief valves by 2023.

The RD specifies that a vapour recovery unit is used for VOC emissions from the loading operation and sets an ELV at the lower end of the range. The VOC permit for the facility (V0001-07) does not set limits for VOC emissions.

The current licence condition requiring a fugitive emission programme is not carried forward as these requirements replace it.

7.5 Emissions from Flares

In line with BAT 55 and 56, the RD requires that flares are used for safety reasons and non-routine operational conditions and when used, that gas flow is monitored and emissions are estimated. The current licence condition 5.11 is now incorporated into Schedule B on emissions from flaring.

7.6 Odour emissions

Odour complaints have been received in relation to this installation. The BAT techniques relating to product treatment process aims to control odour and off-gases from the hydrotreatment process (product treatment) is directed to the ASA plant. Caustic washing is the second product treatment processes carried out on-site. Until October 2017, spent caustic was treated on-site in a dedicated fully automated treatment unit. Hydrogen sulphide off-gases from this unit was disposed of by the sour flare and waste water was routed to the waste water treatment plant. Following odour complaints in 2017 the caustic treatment plant was shut down and all spent caustic is sent for disposal off-site. Work is on-going to find an alternative method for treatment of spent caustic.

The CWW BATC specifies BAT for odour emissions from relevant sources as periodic monitoring and an odour management plan. These requirements have been included in the RD.

8. Emissions to Waters

Emissions to water are reduced by treating waste water and potentially contaminated surface water run-off at the on-site waste water treatment plant. In particular, oil is separated from water and recycled back into the process. Odorous waste water such as sour water are stripped prior to treatment at the on-site treatment plant.

Using 2017 monitoring data, the licensee calculated the yearly average (flow weighted average) for each parameter specified in the Refineries BATC (table 3). The measured yearly averages comply with the BAT associated emission levels in table 3 of the Refineries BATC. The licensee proposed ELVs from the BAT-AEL range for each parameter and the yearly average ELV in the RD is set on that basis.

In addition to the yearly average ELV, the RD carries forward existing ELVs (daily average) and mass emission limits (kg/day). EN standards are specified in line with CWW BATC.

The existing ELV for Total phosphorus is within the BAT-AEL set out in the CWW BATC and therefore is already compliant. It is noted that the licensee proposes to use TOC (preferred method) instead of COD in the future and this is reflected in the RD. As the RD lists the hydrocarbons and metals to be monitored, Note 4 to *Schedule C.2.2 Monitoring of Emissions to Water* of the current licence is not carried forward into the

RD. Condition 4 of the RD includes interpretation on yearly average ELV's and mass flow emissions.

9. Noise

Noise limits are updated in the RD to include an evening noise limit in line with the NG4.

10. Energy Efficiency and Waste Generation

The licensee uses a number of BAT techniques to ensure energy is used efficiently at the installation and these are set out in Schedule C to the RD. The licensee plans to employ an energy engineer to progress energy saving measures.

The licensee re-processes on-site tank bottoms and oil from the API separator. Approximately 70% of waste generated is segregated for re-use or recovery. The main wastes generated on-site are iron & steel and waste water treatment plant sludge which sent for off-site recycling and incineration respectively.

The RD requires a Waste Management plan, the recovery of spent solid catalyst and dewatering of waste water treatment plant sludge in line with BAT.

11. Prevention of Accidents

This installation is an upper tier establishment under the EC (Control of Major Accident Hazards involving Dangerous Substances) regulations (Seveso Regulations) due to storage, use and production of Petroleum Class 1, II and III substances. In addition, Irving Oil stores and uses hydrogen, ethanol and methanol.

As an upper tier establishment, Irving Oil Whitegate refinery has a Major Accident Prevention Policy (MAPP) and Safety Report in place.

In line with BAT, the RD makes a specific requirement to implement a safety management system including a fire safety system and specifies requirements for the storage and handling of dangerous substances on-site.

Irving Oil have completed an Environmental Liabilities Risk Assessment (ELRA) costed at €46,220,000. The financial instrument in place is a bond. The hazard with the highest risk score is the loss of containment from jetty transfer lines during loading / unloading. The key mitigation measures for the prevention of incidents/ accidents are the putting in place procedures for the transfer of product and the inspection and maintenance for tank integrity. These requirements are specified in the RD.

In line with BAT and to prevent emissions to ground from the storage, transfer and handling of liquid hydrocarbon compounds, the RD requires the maintenance programme to include corrosion monitoring and prevention and BAT for piping, flange connections, valves, pumps and seals, compressors and sampling ports.

Other controls in the current licence and carried forward to the RD include high level alarms, bunding, integrity testing of tanks, bunds and pipelines, and the storage of containment booms/ absorbent material.

The RD requires comprehensive groundwater and soil monitoring of the installation.

12. Cessation of activity

The licensee has completed a Closure, Restoration and Aftercare Management plan for the installation under the current licence. It is costed at €21,550,243 and the financial instrument in place is a bond.

Baseline Report

The licensee prepared a baseline report in line with stages 1 to 6 and 8 of the EC guidance concerning baseline reports under Article 22(2) of the IED. The licensee did not undertake any specific site investigation for the purposes of the baseline report (stage 7) and relied on groundwater monitoring data and previous investigations. A number of historic waste areas were assessed and remediated between 2003 to 2008 and incidents involving the loss of hydrocarbons have occurred at the installation. The existing soil and groundwater pollution is considered to be quantified from previous site investigations and biannual groundwater monitoring.

Having consulted with OEE, no further action in relation to residual contamination is deemed necessary at this time.

The baseline report is a tool that permits, as far as possible, a quantified comparison between the state of the site described in that report and the state of the site upon definitive cessation of activities, in order to ascertain whether a significant increase in pollution of soil or groundwater has taken place.

On cessation of the activity where the installation has caused significant pollution of soil or groundwater, Condition 10 of the RD requires the licensee to take measures to address the pollution and to return the site to the state established in the Baseline Report, or otherwise to take actions aimed at the removal, control, containment or reduction of hazardous substances so that the site ceases to pose a significant risk to human health or the environment.

13. Appropriate Assessment

Appendix 1/Table 1 lists the European Sites assessed, their associated qualifying interests and conservation objectives.

A screening for Appropriate Assessment was undertaken to assess, in view of best scientific knowledge and the conservation objectives of the site, if the activities, individually or in combination with other plans or projects are likely to have a significant effect on any European Site. In this context, particular attention was paid to the European Sites at Great Island Channel SAC (site code 001058) and Cork harbour SPA (site code 004030)**.**

The activities are not directly connected with or necessary to the management of any European Site and the Agency considered, for the reasons set out below, that it can be excluded, on the basis of objective information, that the activities, individually or in combination with other plans or projects, will have a significant effect on any European Site and accordingly determined that an Appropriate Assessment of the activities was not required.

This determination is based on the following reasons:

- This review is for the purposes of updating the licence to ensure compliance with the requirements of the European Commission Implementing Decision on BAT conclusions for refining of mineral oil and gas (2014/738/EU) and applicable BAT conclusions;

- This review does not change the nature or extent of emissions; and
- The conditions of the licence requires the treatment of waste water and waste gas on-site, the use of natural gas or refinery fuel gas as the primary fuel and accident prevention measures to be employed.

14. Fit & Proper Person Assessment

The Fit & Proper Person test requires three elements of examination:

- Technical ability
- Legal standing
- Financial standing

It is my view based on these criteria and in consultation with the OEE that the licensee can be deemed a Fit & Proper Person for this review.

15. Cross Office Consultation

I consulted OEE Inspectors, Niamh O'Donoghue and Martin O'Reilly in relation to this site, as well as to OEE Inspector Stephen McCarthy in relation to financial provision. In general, the OEE have no significant concerns regarding the proposed changes to the licensable activity.

16. Charges

The annual enforcement charge recommended in the RD is €27,875, which is the same as that invoiced buy enforcement in 2017.

17. Recommendation

The RD specifies the necessary measures to provide that the installation shall be operated in accordance with the requirements of Section 83(5) of the EPA Act 1992 as amended, and has regard to the AA screening. The RD gives effect to the requirements of the Environmental Protection Agency Acts 1992 as amended and has regard to submissions made.

I recommend that a Proposed Determination be issued subject to the conditions and for the reasons as drafted in the RD.

Signed

Ann Marie Donlon

Ann Marie Donlon

Procedural Note

In the event that no objections are received to the Proposed Determination on the application, a licence will be granted in accordance with Section 87(4) of the Environmental Protection Agency Acts 1992 as amended, as soon as may be after the expiration of the appropriate period.

Appendices

AA table

Appendix 1/Table 1: List of European Sites assessed, their associated qualifying interests and conservation objectives.

Site Code	Site Name	Qualifying Interests (* denotes priority habitat)	Conservation Objectives
001058	Great Island Channel SAC	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	*NPWS (2014) Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.* http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001058.pdf
004030	Cork Harbour SPA	**Birds** A056 Shoveler (Anas clypeata) A149 Dunlin (Calidris alpina) A140 Golden Plover (Pluvialis apricaria) A050 Wigeon (Anas penelope) A028 Grey Heron (Ardea cinerea) A069 Red-breasted Merganser (Mergus serrator) A142 Lapwing (Vanellus vanellus) A130 Oystercatcher (Haematopus ostralegus) A141 Grey Plover (Pluvialis squatarola) A052 Teal (Anas crecca) A054 Pintail (Anas acuta) A157 Bar-tailed Godwit (Limosa lapponica) A162 Redshank (Tringa totanus) A183 Lesser Black-backed Gull (Larus fuscus)	*NPWS (2014) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht*

Site Code	Site Name	Qualifying Interests (* denotes priority habitat)	Conservation Objectives
		A179 Black-headed Gull (Chroicocephalus ridibundus) A004 Little Grebe (Tachybaptus ruficollis) A160 Curlew (Numenius arquata) A182 Common Gull (Larus canus) A048 Shelduck (Tadorna tadorna) A017 Cormorant (Phalacrocorax carbo) A193 Common Tern (Sterna hirundo) A005 Great Crested Grebe (Podiceps cristatus) A156 Black-tailed Godwit (Limosa limosa) **Habitats** WetlandsHabitats	