This Report has been cleared for submission to the Director by Programme Manager Frank Clinton.
Signed Ian Reilly Date 19/1/12

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

OFF LICENSING & RESOURCE USE

INSPECTORS REPORT ON A LICENCE APPLICATION

To:	Directors
From:	Seán O Donoghue - **LICENSING UNIT**
Date:	2011
RE:	Application for a review of an IPPC Licence from ConocoPhillips Whitegate Refinery Ltd., Register No. P0266-02.

Application Details	
Class of activity:	Class 9.3.1: The operation of a mineral oil refinery.
Category of Activity under IPPC Directive (2008/1/EC):	Category: 1.2 Mineral oil and gas refineries.
Licence review application received:	13th September 2011
Notices under Section 90(7) issued:	7th November 2011, 8th December 2011
Information under Section 90 received:	24th November 2011, 13th December 2011
Submissions received:	26th October 2011 (Cork County Council).
Site visits:	18th August 2011, 30th September 2011

Company

ConocoPhillips is a US based international, integrated energy company, among the largest worldwide, and operating in over 30 countries. The company's core activities are: petroleum exploration and production; natural gas gathering, processing and marketing; petroleum refining, marketing, supply and transportation; and chemicals and plastics production and distribution. The Whitegate refinery is one of 16 refineries operated by the company worldwide.

Installation and operations.

The ConocoPhillips Whitegate refinery is located at Whitegate on the eastern shore of Cork Harbour and occupies a large site (of the order of 100 hectares) including Corkbeg Island. Facilities include crude oil storage tanks, intermediate and finished product storage tanks, blending facilities, road loading terminals, effluent treatment, fire fighting facilities, workshops, warehouses and site offices. There is also a marine terminal off Corkbeg Island. The main process units at the installation are the pipestill, powerformer, isomerisation unit, hydrofiner unit, and sulphur recovery unit.

Marine terminal

The marine terminal is located approximately 600m off Corkbeg Island. The terminal is connected to Corkbeg Island by a bridge with a roadway and concrete pile supported trestle providing access and carrying crude oil, product and utility lines. The terminal has two berths, an outside berth which can handle ocean going tankers up to 160,000 tonnes displacement and an inside berth for smaller vessels up to 5,000 tonnes displacement. Both berths are provided with valve manifolds for the importing or exporting of petroleum and crude oil.

Crude oil is delivered by tanker and pumped ashore at the marine terminal for storage. Products including heavy fuel oil are also loaded through dedicated pipelines into vessels at the jetty.

Crude tank farm

Crude oil storage is provided in seven floating-roof crude oil tanks on Corkbeg Island. Crude storage capacity is 180,200 tonnes compared to an annual throughput of 3.65 million tonnes. Five utility tanks are also provided on the island including ballast water and slops, caustic and potable water storage. An API (American Petroleum Institute) separator treats wastewater from ballast/slop handling prior to discharge to Cork Harbour. Following delivery of crude from the terminal it is then pumped on a continuous basis to the refining area.

Refining and product tank farm area

The refining of crude oil and the production of fuel products is carried out by the integration of a number of unit operations.

Refining unit operations include the Pipestill, Reformer, Hydrofiner and Sulphur Recovery Unit. Crude oil is first washed in the desalter to remove salt, and then fractionated based on boiling point temperatures in the Pipestill into the following fractions: Overheads/Refinery Fuel Gas, Jet fuel/Kerosene, Diesel/Gasoil and Heavy Fuel Oil. The overheads are further fractionated to light naphtha, naphtha, and propane/butane gas products. The light naphtha is sent to the isomerisation unit where the octane level is catalytically increased. Naphtha is sent to the powerformer, where it is upgraded catalytically to high octane gasoline blendstock. Other products of the powerformer are propane, butane, and a hydrogen rich gas which is used in the Hydrofiner to remove sulphur from gasoil and kerosene as hydrogen sulphide. The hydrogen sulphide is currently removed from this gas stream by the Sulphur Recovery Unit, where Hydrogen sulphide is converted to elemental sulphur and removed as a water wet sulphur cake using an iron catalyst solution.

The process is continuous and each unit operation is interlinked. The offgasses from operations are fed into an internal fuel system which is managed to provide fuel for process use or feed into the product stream. Intermediate and finished product storage, blending facilities and a road loading terminal are also located on this site. The road loading terminal is subject to a permit (V001-05) issued by the Agency, and reviewed every three years under S.I. 374 of 1997 (Control of volatile organic compounds emissions resulting from the storage of petrol and its distribution).

Steam for site operations is provided by two boilers (12 and 6 MW thermal input) operating on refinery fuel gas/natural gas and a 45 MW thermal input combined heat

and power plant (CHP). Electricity is provided by the CHP plant, and also from the main grid, and emergency diesel generators as backup.

There is no cooling water circuit or associated thermal emission, as process cooling is provided by air coolers.

Licence History

Irish Refining Public Limited Company was granted IPC licence Reg. No. P0266-01 on 17/1/2000. The licence was subsequently amended by Technical Amendment A on 9/11/2005 for the purposes of compliance with the IPPC Directive, and by Technical Amendment B on 10/7/2008 for the purposes of amending the licensed site boundary to accommodate the lease of a portion of the site to Bord Gáis Éireann for the operation of a gas fired power plant (IPPC licence Reg. No. P0830-01).

Reason for Licence Review

In late 2010 the licensee indicated to the Agency that it wished to install an amine sulphuric acid (ASA) plant at the installation for removal of sulphur from various petroleum products including transport fuel, heating oil and LPG, to meet increasingly tight EU product specifications on sulphur content of fuels. This plant is proposed to replace the existing sulphur recovery unit (SRU) by Q1 2012, and planning permission for the plant was granted in January 2011. No EIS was required to be made for the planning consent.

The review application also provided an assessment of the impact of discharges to waters from the installation with respect to the water quality standards specified in the European Communities Environmental Objectives (Surface Waters) Regulations, S.I. No. 272 of 2009.

The application also addresses changes and proposed changes at the installation since the grant of the current licence, with a view to reflecting these changes in the revised licence.

ASA plant and emissions

Sulphur removal in the ASA plant will be achieved by absorption of sulphur compounds in an aqueous amine solution. A desorption step follows which separates the amine from the sulphur compounds, allowing recirculation and recycling of the amine, and the desorbed sulphur compounds are converted to commercial grade concentrated sulphuric acid in a Wet Sulphuric Acid (WSA) process. The ASA process, which is a combination of the amine absorption/desorption process and the WSA process, will replace the existing SRU which converts the sulphur compounds in the gas streams to solid elemental sulphur.

The ASA process will remove a greater proportion of sulphur in crude oils than the SRU process, and can treat up to four times the amount of sulphur compounds. This will enable the licensee to handle increasingly sour (high sulphur) crudes – a necessity due to depletion of low sulphur crudes from the North Sea, while also reducing total SO_2 emissions from the installation. It will also allow the removal of H_2S from LPG (known as "LPG sweetening"), which the SRU cannot do, and thus facilitate a reduction of up to 90% in the amount of caustic soda currently used at the installation for this purpose. The ASA process will also eliminate the ammonia emission to air currently arising from the SRU. The ASA process is a common

technology used in refineries in Europe and the USA, and is listed in the IPPC Reference Documents (BREF) on *Best Available Techniques for Mineral Oil and Gas Refineries, 2003.*

There will be effluent emissions from the ASA process, but these will be discharged via the existing effluent discharge point, and no increase in existing emission limit values will be required. There will be a new emission point to air consisting of SO_2, NOx and sulphuric acid mist, to be emitted from a 30m stack. The licensee conducted air dispersion modelling of the emission to assess impact with respect to Air Quality Standards (AQS) and guidelines.

Class of activity.

The ASA plant is not a standalone process, but will be an integrated part of the refineries activities. It cannot operate unless the refinery is operating and H_2S is being produced in the refinery's hydrodesulphurising process. As mentioned above, this technology is also referenced in the Refineries BREF. It is therefore a refining activity, and no new class of activity is required in the licence.

Emissions

Approach to setting emission limit values.

Emission limit values for emissions to air and water are set in the RD on the basis of compliance with BAT, and also ensuring that the emission does not cause a breach of relevant environmental quality standards or guidelines. The setting of ELVs in the RD so as to satisfy both these criteria, and other controls on emissions from the installation, is set out below.

Air

Air emissions at the installation are almost entirely from combustion sources (with the exception of the SRU plant stack at present and ASA plant stack in future). Off gasses from refining activities containing hydrogen sulphide and hydrocarbons are routed through the SRU for sulphur removal, with the clean gas then routed to the installation's boilers, furnaces, and gas engines for use as a fuel (with gasoil used as backup fuel for the CHP plant). This fuel has been supplemented with natural gas since 2009, prior to this HFO was the supplementary fuel. The licensee wishes to maintain the option to use HFO as a contingency, and the RD has set ELVs for these fuel use scenarios accordingly.

The SRU plant will be replaced by the ASA plant, which will entail the elimination of the existing ammonia emission, as the ASA process converts ammonia to NOx, and subsequently reduces about 95% of the NOx to N_2 by selective catalytic reduction. There will be an emission of sulphuric acid mist from the ASA plant stack, and an acid mist abatement unit which is feedback controlled by a continuous acid mist sensor located in the stack.

SO_2 emissions at the installation will vary based on three different ASA plant operating scenarios:

(a) Normal operation: where the ASA plant is online, using natural gas as a supplementary fuel.
(b) ASA plant is online and HFO is the supplementary fuel.
(c) ASA plant offline. The plant requires two weeks scheduled maintenance every two years. It is not feasible to shut down the refinery for this event. Natural gas only will be used as the supplementary fuel in this scenario.

Due to the linked nature of sulphur removal plant operation and air emissions from combustion plant at the installation, a "site bubble limit" approach is taken in the current licence, and is proposed to be continued, whereby a total SO_2 mass emission limit for all main emissions at the installation is set. This bubble approach is discussed in the Refineries BREF, which outlines the technical, economic, and environmental justifications for its application, and are related essentially to the complexity of a refinery, and the requirement for flexibility of operation. The bubble limit control on SO_2 emissions allows for such flexibility while also protecting air quality in the local environment. Compliance monitoring with the limit is based on continuous monitoring of fuel flowrates, and compositional analysis of fuel, for each fuel and each combustion unit at the installation, allowing calculation of the total SO_2 emission on an hourly basis.

The BREF does not set out BAT Associated Emission Levels (AELs) for SO_2 bubble limits. However benchmark values are provided, (50 – 230t SO_2/Mt crude processed) which indicate that the installation emissions are normally at the lower end of this range, at or below 72t SO_2/Mt, which equates to the 30 kg/hr figure quoted below.

The current bubble limit is 245 kg/hr. The ASA plant will achieve a significant reduction (approx. 40%) in SO_2 emissions under normal operation, scenario (a), with the refinery expected to achieve an average level under 30 kg/hr. However due to the potential for fluctuation in the fuel mix, the licensee has proposed a bubble limit of 150 kg/hr. The licensee has also requested to keep the existing bubble limit of 245 kg/hr for scenario (b) which is expected to be required only in exceptional circumstances, while for scenario (c) a limit of 370 kg/hr is requested.

The RD (condition 5.7) sets the bubble limits as requested, with condition 5.8 stipulating that the 370 kg/hr limit applies only for two weeks in every two year calendar period, and permits processing of low sulphur crudes only during this time, to minimise SO_2 emissions. The licensee is also required (condition 6.18) to calculate total SO_2 emissions for each operating scenario in order to demonstrate compliance with each of these limits. Condition 6.19 requires the operating times of the ASA plant, and the supplementary fuel used, to be recorded and reported to the Agency as part of the AER, and any exceedance of the permitted ASA plant downtime to be reported as an incident.

Impact of Air Emissions on Receiving Environment.

Air dispersion modelling was carried out in 2010 and 2011 using AERMOD in order to predict the impact of emissions from the installation with respect to relevant Air Quality Standards (AQS) or guidelines. The applicant used five years of meteorological data from Cork airport, which is considered the most representative due to proximity and the range of parameters available. The results from the worst-

case year (1999) were used as results. Topography and building wake effects were also considered in the model. The highest predicted ground level concentrations (GLC) arising for each modelled parameter (SO_2, NO_2, CO, and sulphuric acid mist) were then compared with the relevant AQS or guideline (see tables 1 and 2 below). These GLCs incorporated relevant background values for each parameter based on monitoring data from the EPA and other sources.

For SO_2 the applicant modelled the three scenarios outlined above on a year round basis incorporating all major emission points at the installation. For scenario (c), this far exceeds worst-case, as the RD permits this operational mode only for two weeks in a two year calendar period. The results indicate compliance with all AQS and guidelines for all scenarios.

Table 1: Maximum Predicted Ground Level Concentrations (GLCs) for NOx, sulphuric acid mist, and CO (ug/m^3).

Parameter	Modelled Impact	Background Concentration	Maximum Predicted GLC	AQSs/ Guidelines
Nitrogen Oxides (as NO_2)	99.8%ile 1 Hour Average	12	86.4	200 Note 1
Sulphuric acid mist	1 hour average	n/a	1.19	300 Note 2
	24 hour average	n/a	0.21	5 Note 2
	Annual average	n/a	0.021	10 Note 2
CO	8 hour limit value	2,000 Note 3	56	10,000 Note 1

Note 1: Air Quality Standards Regulations (SI No. 180 of 2011) and 2008/50/EC.
Note 2: UK EA Environmental Assessment level (EAL)
Note 3: A maximum measured background value for Zone C (urban areas) was used, as no data was available for Zone D (rural areas).

Table 2: Maximum Predicted Ground Level Concentrations (GLCs) for SO_2 under 3 operating scenarios.

Parameter	Modelled Impact	Background Concentration	Maximum Predicted GLC µg/m³	Air Quality Standards µg/m³
Scenario (a)	99.7%ile 1 Hour	4	24	350 Note 1
	99.2%ile 24 hours	8	19	125 Note 1
	Annual Average	8	5	20 Note 1
Scenario (b)	99.7%ile 1 Hour	4	82	350 Note 1
	99.2%ile 24 hours	8	41	125 Note 1
	Annual Average	8	9	20 Note 1
Scenario (c)	99.7%ile 1 Hour	4	124	350 Note 1
	99.2%ile 24 hours	8	60	125 Note 1
	Annual Average	8	12	20 Note 1

Note 1: Air Quality Standards Regulations (SI No. 180 of 2011) and 2008/50/EC.

Water

All process effluent and rainfall landing on paved areas of the site enter a common drainage network with flows up to 50m³/hr (this represents average dry weather flow) directed to the wastewater treatment plant (WWTP) on site, and discharged via SW1 to Cork Harbour. Flows between 50 and 250 m³/hr pass, via the API separator, to temporary storage tanks, for treatment at a later time. Flow in excess of 250 m³/hr (representing a 1 in 10 year storm event) discharges to Cork Harbour via SW1 and the separator, but bypasses the WWTP. The routing of rainwater to a WWTP from areas where there is potential for oil contamination is a normal practice in the industry, and is listed as a technique for consideration in the BAT guidance note for refineries.

The API separator facilitates primary oil recovery through fixed and mobile oil skimmers, with recovered oil reprocessed in the distillation unit. The separator also has a residence time up to 30 hours, representing significant balancing capacity. From the API, the wastewater is pumped at 100 m³/hr to the Dissolved Air Flotation (DAF) unit, where the addition of flocculant, coagulant and dissolved air leads to the formation of a wet sludge on the surface of the unit. This sludge is subsequently dried in a centrifuge. The effluent then passes to the biological unit, where it is equalised (12 hours buffering capacity), nutrient balanced (addition of Carbon, Nitrogen and Phosphorus), pH corrected, and aerated. The effluent is then clarified and sand filtered prior to discharge. The wastewater treatment system at the installation has been upgraded progressively between 2005 and 2010, at an estimated spend of €6.8 million.

Emission levels in SW1 for some parameters, such as BOD, COD and ammonia, significantly exceed the levels specified in the BAT guidance note for oil refineries, in particular BOD which can be emitted at up to 8 times the BAT specified limit of 20 mg/l. In the application the licensee has pointed to the low effluent volumes generated at the installation per tonne of crude processed due to water conservation measures, and points out that, on the basis of mass emissions of BOD per tonne crude processed, the installation is on a par with a typical European refinery. Information in the BREF note for refineries appears to support this contention, indicating that typical effluent volumes per tonne crude are up to 5 – 20 times the $0.2m^3$ figure attained at the Whitegate installation. On this basis, it is considered that the emission levels at the installation can be considered to represent BAT. Condition 2 requires the licensee to establish a water management scheme, to investigate the feasibility of measures to minimise water usage, water contamination and effluent volumes at the installation. This is consistent with BAT for reduction of discharges to water as specified in the BAT guidance note for refineries and the Refineries BREF.

A second emission point, SW-2, was traditionally used to discharge ballast water from ships, and crude oil storage tank "bottoms" (mainly water). Most oil tankers now have facilities to retain ballast waters, and tank bottoms are sent to the WWTP. The emission point is therefore rarely used, occasionally for discharging clean ballast water, and seawater used for hydrostatic testing of tanks. The discharge is via an API separator, which dates from when ballast waters had the potential to be oil contaminated. Condition 3.17 of the RD requires the licensee to demonstrate to the satisfaction of the Agency that these waters are uncontaminated prior to discharge.

Sanitary effluent generated at the installation (155 population equivalent) is currently treated in an Imhoff tank and discharges via SW-5 to Lower Cork Harbour. The licensee estimates the BOD discharged from SW-5 is about 4% of the proposed limit for SW-1. Condition 3 of the RL requires the licensee to install a treatment system within eighteen months of the date of grant of licence that meets the standards as set in the Agency publication "*Wastewater Treatment Manuals - Treatment Systems for Small Communities, Business, Leisure Centres and Hotels (p.e. 10 - 500)*".

Impact of Emissions on Receiving waters.

The following table summarises the main considerations in relation to the receiving water, Lower Cork Harbour.

Table 1.0 Receiving waters

Characteristic	Information	Comment
Receiving water name and code	Lower Cork Harbour (SE_100_0550)	Coastal water body.
Trophic status	Intermediate (2007-2009)	Due to Winter DIN
WFD Status	Moderate	Due to nutrient input
WFD Risk	1A – at risk	Objective is to restore by 2021
WFD Protected Areas	Great Island Channel (Special Area of Conservation); and Cork Harbour (Special Protection Area).	
WMU Action plan	South Western River Basin District (RBD) Transitional and Coastal Waters (TrAC) Action Programme	Installation not identified as a pressure.

Emissions to waters at the installation discharge to Lower Cork Harbour, which is a coastal waterbody currently assigned moderate status in the South Western River Basin District (RBD) Transitional and Coastal Waters (TrAC) Action Programme developed under the Water Framework Directive.

The licensee assessed the impact of emissions to waters with respect to the relevant water quality standards (WQS) specified in the European Communities Environmental Objectives (Surface Waters) Regulations, S.I. No. 272 of 2009. The applicant used the dispersion model for coastal waters developed by the Agency to estimate the contribution of the discharges from SW-1 and SW-5 to ambient concentrations of these substances in the waterbody. The applicant also monitored dissolved oxygen (DO) concentrations in the receiving waters.

The applicant used background values for BOD & Dissolved Inorganic Nitrogen (DIN) taken from the EPA Water Quality in Ireland 2007 - 2009, and for Heavy Metals used the Marine Institute report on dangerous substances in transitional and coastal waters 2007 – 2009. Table 2 below sets out the impact of the discharge from SW-1 on the receiving water with regard to WQS.

Table 2.1: SW-1 impact on receiving waters.

Parameter	Background Conc (mg/l)	*Proposed* ELVs (mg/l)	Contribution from the discharge Note 1 (mg/l)	Predicted conc Note 1 (mg/l)	WQS (mg/l)
BOD	1.5	150	0.84	2.33	≤4 Note 2
DIN	0.816 (winter)	25 (Total N)	0.14	0.83	0.25 Note 2
Ni	0.0057	0.1	0.00056	0.0063	0.02 Note 2
Cu	0.0023	0.3	0.001	0.0033	0.005 Note 2
Cd	0.000063	0.01	0.000056	0.00012	0.0002 Note 2
Zn	0.034	0.5	0.0029	0.036	0.04 Note 2
Hg	0.000009	0.001	0.0000056	0.000015	0.00005 Note 2

Note 1: Based on proposed ELVs.
Note 2: European Communities Environmental Objectives (Surface Waters) Regulations 2009.

For BOD the applicant compared the results with the transitional waterbody WQS of 4.0 mg/l, in the absence of a coastal waterbody EQS. The model results indicate ambient concentrations well below this standard for both discharges. For assessment of the impact of discharges with respect to the DIN (full salinity) coastal 'good status' WQS of 0.25 mg/l, an increase is predicted in ambient DIN of 0.14 mg/l for SW-1, and 0.001 mg/l for SW-5. These values are well below the WQS, however elevated background levels in winter (winter median value is 0.816 mg/l, whereas summer value is 0.136), which exceed the WQS, indicate that the discharge will, if only slightly, exacerbate the exceedance. The TrAC Action Programme identifies diffuse nutrient inputs from agriculture as the key pressure giving rise to elevated DIN in the receiving water. The RD sets an ELV for Total Nitrogen at SW-1, which mostly consists of DIN, in accordance with the modelled values and with BAT, and requires weekly monitoring of the DIN concentration in SW-1. The requirement to install a treatment system for sanitary effluent, as outlined above, will ensure that emissions from SW-5 have a minimal impact on water quality.

The ambient DO monitoring results submitted indicated that the discharges have no noticeable impact on DO levels in the receiving waters.

The Surface Water Regulations 2009 also specify WQS for a range of metals. The effluent discharge from SW-1 contains several metals, including Mercury and Cadmium which are designated under the Regulations as priority hazardous substances, Nickel and Lead, which are designated priority substances, and also Arsenic, Chromium, Copper and Zinc. The Regulations require the drawing up, by June 2012, of pollution reduction plans by coordinating local authorities (in consultation with the EPA) to reduce pollution by priority substances and to cease and/or phase out discharges, emissions or losses of priority hazardous substances. The relevant pollution reduction plan has not yet been completed. It should be noted that these compounds are present in the discharge in question due to their presence in the crude oil processed at the installation, and therefore operation of the refinery is not compatible with the complete elimination of these substances from the discharge. However the application of BAT, as described above, can ensure that the discharge of these substances can be minimised.

Concentrations of Chromium, Lead and Arsenic *in the discharge* at SW-1 are less than the WQS specified in the Regulations for receiving waters, and therefore given the large dilution available in the coastal water body (conservatively estimated at over 170 dilutions), the increase in ambient concentration due to the discharge is negligible for these parameters. They are therefore considered to be at trace levels in the discharge, and ELVs have not been set in the RD for these compounds. Other metals such as Mercury, Cadmium, Copper, Zinc and Nickel were detected in the discharge at concentrations in excess of the WQS. However, the modelling indicated that ambient concentrations outside the mixing zone would be well below any relevant WQS, given the discharge concentrations and large dilution received in the waterbody.

ELVs for these parameters have been set accordingly for SW-1 in the RD, with mass emission limits specified based on the values used in the modelling. These values are based on a volumetric flow of $100m^3/hr$, representative of normal discharge levels as outlined above, however a volumetric flow of $500m^3/hr$ has been set in the RD to allow for discharge during exceptional storm events, when excess volumes require bypass of the treatment system as described above. Given that any such excess flow will consist of stormwater, it is expected that the mass emission limits can be complied with in these circumstances also. The setting of these mass emission limits, in combination with significantly reduced ELVs for several parameters with respect to the current licence, gives rise to a substantial reduction in the permitted discharge loadings in the RD for many parameters, e.g., the permitted Mercury discharge loading is just 2% of that permitted in the current licence.

Emissions to ground

There are no emissions to soil or groundwater at the installation and the proposed ASA plant will not change this. The RD requires comprehensive groundwater monitoring at the installation as agreed by the OEE under the current licence.

Noise

The replacement of the existing SRU plant with the ASA plant is expected to reduce noise emissions, due to the removal of a belt press and air blower. The most recent noise surveys, carried out as required by the licence, indicate that the installation is fully compliant, with daytime and night-time noise ELVs not exceeded at noise sensitive locations. There have been no noise complaints in recent years. The RD requires the installation to continue to meet these ELVs at noise sensitive locations, and also requires an annual survey to assess compliance.

Use of Resources

Fuel

The refinery's main fuel is a mixture of hydrocarbon gasses produced in the refining process on site. Heavy Fuel Oil has traditionally been used as a supplementary fuel, however this was replaced by natural gas in 2009, with all boilers and furnaces at the installation now running on a combination of refinery gasses and natural gas during normal operations. This change in fuel use was a major project for the licensee, and yields significant environmental benefits in terms of energy efficiency, and substantial reductions in CO_2, SO_2 and NOx emissions.

Greenhouse gas emissions and Climate Change impact

With regard to reducing the Climate impact of the installation under IPPC, the installation has a CHP unit which is far higher in overall thermal efficiency than the national grid average, and is continually improving energy efficiency, with measures such as fuel metering, pinch technology for maximising heat recovery, improved combustion control, and switching to natural gas as outlined above . As a result CO_2 emissions from the installation are decreasing substantially. The RD requires an energy efficiency audit and an assessment of resource use efficiency. The EMP objectives and targets include use of cleaner production (including production related carbon footprint).

The installation has a Green House Gas (GHG) Permit (Reference IE-GHG013-04) in accordance with the European Communities (Greenhouse Gas Emissions Trading) Regulations 2004, (S.I. 437 of 2004 and amendments), from the Agency. Regulation 23 requires that the Agency shall not have regard to ELVs, BAT, or require a licence review, with respect to greenhouse gases unless it is necessary to ensure no significant local pollution. CO_2 will be the only such greenhouse gas emitted from the installation in significant quantities.

Compliance with EU Directives

IPPC Directive (2008/1/EC)

This installation falls within the scope of :

Category 1.2 *Mineral oil and gas refineries,*

of Annex I of Council Directive 2008/1/EC concerning integrated pollution prevention and control.

The Recommended Determination (RD) as drafted takes account of the requirements of the Directive. BAT is represented by the EPA IPPC BAT Guidance Note for Oil and Gas Refineries and the guidance given in the IPPC Reference Documents (BREF) on *Best Available Techniques for Mineral Oil and Gas Refineries.*

Seveso Directive (96/82/EC) as amended by 2003/105/EC

The Health and Safety Authority (HSA), which is the competent authority responsible for administration and enforcement of these regulations (S.I. No. 74 of 2006), currently classifies the installation as an upper tier establishment under these Regulations. Under Section 12 of these regulations, the applicant prepared, and submitted to the HSA, a Safety Report. Under Section 13, this report is reviewed and revised at least every 5 years. The latest revision was submitted to the HSA, and deemed acceptable, in March 2011.

The HSA, as a statutory consultee on IPPC licence applications, has been notified of the review application and has made no submission on the application. As part of the planning process for the ASA plant, the applicant conducted an assessment which concluded that the ASA plant will pose no significant increase in the level of safety risk. This assessment was submitted to the HSA.

Air Quality Directive (2008/50/EC)

The CAFE Directive 2008/50/EC has replaced the Framework Directive (96/62/EC) and the first three daughter directives, including 1999/30/EC (NOx, SO_2, PM_{10}, and Lead). CAFÉ has introduced a limit for $PM_{2.5}$ in addition to the parameters covered by the earlier Directives. This has been transposed as S.I. 180 of 2011. All earlier Irish legislation including the Air Quality Standards 2002 is now revoked.

As outlined above, dispersion modelling of emissions to air was undertaken which included the new emission point, and indicated that emissions from the installation will not cause any breaches of relevant Air Quality Standards, as specified in S.I. No. 180 of 2011.

Emissions Trading Directive (2003/87/EC)

As outlined above, the installation has a Greenhouse Gas Permit (Reference IE-GHG013-04) from the Agency, as required under this Directive.

Environmental Liability Directive (2004/35/CE)

The existing licence required an Environmental Liabilities Risk Assessment (ELRA) to be completed and financial provision for environmental liabilities to be made. The RD includes a requirement to review this within three months of the date of grant of licence, and at least every three years thereafter, and submit the results in the AER.

Water Framework Directive [2000/60/EC]

There are no emissions to groundwaters from the installation. The impact of process effluent and other emissions to surface waters are discussed above.

European Communities Environmental Objectives (Surface Water) Regulations, S.I. No. 272 of 2009

There are process emissions to surface waters from the installation, as outlined above. The controls on these emissions specified in the RD will ensure that these emissions do not cause a breach of these regulations.

European Communities Environmental Objectives (Ground Water) Regulations, S.I. No. 9 of 2010

There are no emissions to groundwaters from the installation.

Shellfish Waters Directive [2006/113/EC]

The process effluent discharge point from the installation, SW-1, is located approximately 5.5 km from the nearest designated shellfish waters at Rostellan. There are three designated sites in the area, Rostellan North, Rostellan South, and Rostellan West. The characterisation reports and Pollution Reduction Programmes (PRPs), developed to ensure compliance with the standards and objectives for these waters established by the 2006 Quality of Shellfish Waters Regulations (S.I. No. 268 of 2006) and with Article 5 of Directive 2006/113/EC, indicate that the installation is not having an impact on the quality of these waters. This conclusion is supported by the conclusions of the impact assessment on emissions to waters conducted for the application as discussed above.

Habitats Directive (92/43/EC) & Birds Directive (79/409/EEC)

There are two Natura 2000 sites within a 15km radius of the installation, namely:

- Great Island Channel (Special Area of Conservation); and
- Cork Harbour (Special Protection Area).

The applicant completed a screening for an appropriate assessment which concluded that the installation is unlikely to have any significant impact on these designated sites. I am satisfied on the basis of the assessment that the installation, as controlled by the provisions of the RD, will not have an adverse impact in this regard.

Cross Office Liaison

Information in relation to the licensee's compliance with the current licence was provided by John Doheny in the Office of Environmental Enforcement (OEE).

Best Available Techniques (BAT)

I have examined and assessed the application documentation and I am satisfied that the site, technologies and techniques specified in the application and as confirmed, modified or specified in the attached Recommended Decision comply with the requirements and principles of BAT. I consider the technologies and techniques as described in the application, in this report, and in the RD, to be the most effective in achieving a high general level of protection of the environment having regard - as may be relevant - to the way the facility is located, designed, built, managed, maintained, operated and decommissioned.

Compliance Record:

There have been no major compliance issues at the installation in recent years.

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 on consultation with the OEE, that the applicant can be deemed a Fit & Proper Person for the purpose of this review.

Complaints

A small number of complaints have been received in recent years regarding short term air pollution incidents from combustion plant, such as black smoke, and also occasional odour complaints. These complaints are sporadic and infrequent, and the OEE consider that the licensee's corrective actions have been effective.

Submissions

One submissions was received from Jacinta Reynolds, Senior Scientist, Cork County Council Environment Directorate. The content of the submission is summarised as follows (in italics):

The hydrogeological assessment report (January 2001) conducted by the licensee indicates that a portion of the groundwater at the installation discharges, via Glenagow stream, to White Bay, an important amenity and bathing water (although not a designated bathing water) in the area. The stream discharges directly onto the beach itself, and into the bathing water. The licensee has conducted monitoring of other bathing waters in the vicinity of the refinery. Cork County Council recommends that the Agency assess the impact of the stream on water quality in White Bay, and require the licensee to monitor the quality of bathing waters in the bay on an ongoing basis.

Response:

The licensee is required under the current licence to monitor water quality in the discharge at SW-3, which is a discharge of groundwater (i.e. a spring) to the Glenagow stream. Ongoing monitoring of the discharge at SW-3 indicates no contamination which would impact on the stream or, in turn the bathing waters. It is not therefore considered necessary to require the licensee to conduct water quality monitoring in White Bay. The RD requires monthly monitoring of the discharge for several relevant parameters, and also weekly visual inspection, similar to the existing licence.

Recommended Determination (RD)

The RD permits the operation of the ASA plant. The RD also gives effect to the requirements of the EPA Acts 1992 to 2011.

Charges

The annual enforcement charge has been set in the RD at €32,373, which is a slight increase on the 2012 enforcement charge for the existing licence of €32,099. This increase is due to some additional AER reporting requirements.

Recommendation

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

Signed

Seán O Donoghue

Procedural Note

In the event that no objections are received to the Proposed Determination of the application, a licence will be granted in accordance with Section 87(4) of the Environmental Protection Agency Acts 1992 and 2011 as soon as may be after the expiration of the appropriate period.