eni Liverpool Bay Operating Company Limited

Point of Ayr Gas Terminal
Environmental Permit 4-Yearly Submission

Raw Materials
Water Use
Waste Handling

June 2014

1.0 Introduction

This is the 4-yearly update to the eni Liverpool Bay Operating Company Limited (eni LBOC) Point of Ayr (POA) Gas Terminal Raw Materials/Water Use/Waste Summary Report. This document is required to be submitted to the regulator (NRW) within 2 months of the date of issue of the site Environmental Permit, and to be reviewed at least every 4 years.

This document was originally submitted to the Environment Agency in pursuance of Conditions 1.4.1 and 1.5.1 of former Environmental Permit No. ZP3331LM, issued to BHP Billiton.

The POA Gas Terminal was operated by BHP Billiton up to 31st March 2014. On April 1st 2014 the operatorship was transferred to eni LBOC. The eni site environmental permit is now issued by Natural Resources Wales (NRW) and has reference number EPR/DP3934EW.

2.0 Contents

3.0 Raw Materials

Table 3.1 summarises materials used in significant quantities during CY2013, outlining quantity used, potential for environmental impact and any appropriate alternatives (plus justification). There was a planned maintenance shutdown during 2013, which contributes to increased quantities of some materials. Table 3.2 presents the same information for materials used in smaller quantities.

3.1 2013 Raw Materials Used (Significant Quantities)

Material	Application	Estimated 2013 Use	Fate (Water/Air/Land)	Environmental Impact	Suitable Alternative (Yes / No)
Feed Gas	Site output, and used as fuel gas for onsite power generation	833,732 tonnes	99% sold as a product 1% to flare	Greenhouse gases	No
Propane	Alternative flare support gas	184599 L (flare propane)	100% to air	Greenhouse gas	No
Mono Ethylene Glycol (MEG)	Prevent hydrate formation in dewpoint control units	66 tonnes	100% to closed drains and then pumped offshore to prevent hydrate formation in condensate return line to Douglas or tankered offsite	Low potential for bioaccumulation and low environmental impact	No
Methyl Diethanolamine (MDEA)	Liquid used to remove hydrogen sulphide from sour gas	0	99% of waste goes to amine sump and is tankered offsite. 1% goes to landfill in used filters	Biodegradable, low potential for bioaccumulation, harmful to aquatic organisms	No
Heat transfer oil (Thermocal HT6)	Liquid heating medium for various reboilers – synthetic hydrocarbon	1600 L	100% combustion	Low environmental impact	No
Diesel	Fuel supply to back-up power generator, standby boiler, emergency generator and diesel firewater pump.	322039 L	100% combustion	Toxic to aquatic organisms and potential to bio-accumulate	No
NALCO 3434	Liquid oxidising biocide for cooling system	5220 L	100% combustion	Low biodegradability, not expected to bio accumulate, possible environmental impact if enters watercourse	No

Material	Application	Estimated 2013 Use	Fate (Water/Air/Land)	Environmental Impact	Suitable Alternative (Yes / No)
NALCO 7330	Liquid non-oxidising biocide for cooling water system	100 L	100% combustion	Toxic to aquatic organisms and not expected to bioaccumulate	No
NALCO 93033	Liquid oxidising Biocide based upon chlorine for cooling system	11715 L	100% combustion	Low biodegradability, possible environmental impact if enters watercourse and not expected to bioaccumulate	No
Acid cooling water	50% sulphuric acid to control pH in cooling system	6012 L	100% combustion	Dangerous to aquatic organisms, causes damage to crops & vegetation, will not bioaccumulate, slow degradation	No
NALCO 1820	Liquid corrosion inhibitor for steam and condensate lines	4224 L	100% to water	Biodegradable, not expected to bioaccumulate and harmful to aquatic organisms	No
NALCO EC9055A	Liquid antifoam for TGU and GSU amine/solvent systems	2000 kg	As for amine	Biodegradable, not expected to bioaccumulate and low impact	No
Granular Hydrosoft Salt	Colourless crystals for water softening in boiler feed system	98 kg	100% water	Low environmental impact	No
Caustic Soda Solution (Sodium Hydroxide)	Scrubbing Liquid in Tail Gas Unit (TGU)	20400 L	100% waste (by tanker)	Concentrations greater than 10ppm or a pH value above 10.5 may be fatal to fish and other aquatic organisms, readily biodegradable	No
NALCO EC9163A	Liquid antifoam for glycol system	800 L	As glycol	Biodegradable, not expected to bioaccumulate, low impact	No
NALCO 71D5 PLUS	Liquid cooling water antifoam	25Kg only	100% to water	Potential to bioaccumulate, harmful to aquatic organisms	No
Nitrogen	Viscous liquid	701765 kg	To air	No known impact	No
Sodium carbonate	For use on acid spills	None used in 2013	100% waste (dirty water bund and by tanker)	Low environmental impact	No
Arctic foam 602 (AFFF)	Used to cover/extinguish hydrocarbon liquid-based fires	600 L	100% to water (brook)	Low biodegradability, low environmental impact	No

Material	Application	Estimated 2013 Use	Fate (Water/Air/Land)	Environmental Impact	Suitable Alternative (Yes / No)
Ecosorb	De-odouriser – used as a mist	75 L	Dispersed to air	Low risk to environment	No
Denstone 57	Used as catalyst in first converter 1	None used in 2013	All removed off site	Low risk to the environment	No
Activated carbon	Amine system and Air scrubbers	1875 kg	All removed off site	Low risk to the environment	No
Titanium CRS31	Used as catalyst in first converter 2	None used in 2013	All removed off site	Low risk to the environment	No
Claus CR-3S Alumina	Used as catalyst in first converter 3	None used in 2013	All removed off site	Low risk to the environment	No
Criterion 534SH	Used as catalyst in first converter 4	None used in 2013	All removed off site	Low risk to the environment	No

3.2 2013 Raw Materials Used (Small Quantities)

Material	Application	Estimated 2013 Use	Fate (Water/Air/Land)	Environmental Impact	Suitable Alternative (Yes / No)
Refined Mineral oils					
Castrol Aircol PD 150	Air compressor lubricant	0 L	100% waste. All oil collected and sent off-site for re-processing.	Biodegrades slowly, non-toxic to aquatic organisms and potential to bio-accumulate	No
Castrol Perfecto T46	Oil for turbines	100 L	100% waste. All oil collected and sent off-site for re-processing.	Biodegradable, not expected to be harmful to aquatic organisms	No
Castrol Hyspin AWH-M15	General use on during shut-down	0 L	100% waste. All oil collected and sent off-site for re-processing.	Biodegradable, not expected to be harmful to aquatic organisms	No

Material	Application	Estimated 2013 Use	Fate (Water/Air/Land)	Environmental Impact	Suitable Alternative (Yes / No)
Castrol Enduran Plus 5W/40 20 l	Engine oil	0 L	As above	Biodegradable, not expected to be harmful to aquatic organisms	No
Lubricants					
Castrol 778	Amber liquid for gas turbine lubrication	0 L	100% waste. All oil collected and sent off-site for re-processing.	Biodegradable, not expected to be harmful to aquatic organisms	No
Castrol Alpha SP100	Lubricant	0 L	As above	Biodegradable, not expected to be harmful to aquatic organisms	No
Castrol Alphasyn T220	Lubricant	20 L	As above	Biodegradable, not expected to be harmful to aquatic organisms	No
Castrol Alphasyn PG150	Lubricant	20 L	As above	Biodegradable, not expected to be harmful to aquatic organisms	No
Degreaser					
Zok 27	Mild detergent for washing turbine blades	0 Ltr	100% waste	Biodegradable, not expected to bio accumulate, non-toxic to aquatic organisms	No
Others					
Anti-freeze	Level pots	None used in 2013	Evaporation / leaks	Low potential for bio-accumulation, low environmental impact, biodegradable	No
Mastic	Used a s sealant on facility during shut down	None used in 2013	100% to waste	Low environmental impact	No
Hylomar Blue	Jointing compound	1 kg	100% to waste	Low biodegradability, not expected to bio-accumulate, not expected to be toxic to aquatic organisms.	No
Citra sol	Domestic cleaning fluid	125ltr	100% to foul sewer	Low environmental impact	No
Decon 75	Basic washing fluid	25 L	100% to foul sewer	Low environmental impact	No
Combined cleaning fluids	Kitchen cleaning fluid	50 ltr	100% to foul sewer	Low environmental impact	No
Castrol Auto Transmission Fluid	Automatic Transmission Fluid	100 L	100% waste. All oil collected and sent off-site for re-processing.	Biodegradable, not expected to be harmful to aquatic organisms	No

Material	Application	Estimated 2013 Use	Fate (Water/Air/Land)	Environmental Impact	Suitable Alternative (Yes / No)
Castrol Aircol PD150	Air Compressor oil	0 L	100% waste. All oil collected and sent off-site for re-processing.	Biodegradable, not expected to be harmful to aquatic organisms	As above

3.3 Laboratory Chemicals

In addition to the raw materials listed in Tables 1 and 2 there are a number of chemicals stored in the on-site laboratory that are used in minor quantities for various process tests. They are stored in small quantities (maximum of 3.5 litres) in the laboratory, where they are locked in cupboards when not in use. All drainage from the laboratory is to a dedicated sump that is pumped out for disposal off-site. For these reasons it is not considered necessary to list these chemicals here.

3.4 Radioactive Sources

Point of Ayr has four fixed radioactive sources as detailed in Table 3 below. These four radioactive sources were replaced between November 2012 and January 2013, at the expiry date of the previous sources (15 years' service). The size of the isotopes remains the same.

3.4 - Radioactive Substances Inventory

Location	Tag No.	Source No.	Isotope	Activity	Status
Inlet Densitometer	DT24100	0498/11	Cs 137	0.7 GBq	Active
Closed Drains Drum	LT32155	0117/11	Cs 137	3.7 GBq	Active
Slug Catcher	LT32101	0119/11	Cs 137	3.7 GBq	Active
Slug Catcher	LT32101	0118/11	Cs 137	3.7 GBq	Active

The use and transportation of these sources is controlled via the Radiation Local Rules Sealed Sources Procedure (H-000-LG-004), which requires monthly checks on the source housing, regular audits and radon source analysis to take place.

4.0 Water Use

4.1 Water Supply

All water used at the site (domestic and industrial) is taken from the mains supply via a 14" main to the POA inlet header containing two water meters arranged in parallel. Downstream of the meters, a crossover line allows either meter to be selected for duty. One of the metered lines feeds the fire-water pond as necessary, whilst the other provides a continuous supply to:

- Administration Building/Control Room/Gatehouse
- Workshop
- Maintenance Area
- Laboratory
- Eyewash/Shower Units
- Utility Water Storage Tank (which itself supplies the other process requirements onsite).

4.2 Annual Water Consumption

Table 4.2 - Annual Water Use - 2013

2013	Mains Meter
Annual Water used	79,196 (m^3)

5.0 Waste

5.1 Waste Generated

Table 5 details the waste type, source and the quantity generated in 2013.

Table 5.1 – Point of Ayr Waste Summary, 2013

Waste Type	Source	Annual Quantity (Tonnes)
Aqueous liquid wastes containing chemicals	Pipeline from offshore, tail gas unit and contaminated water from site bunds	173.14
Green waste	Gardening activities	3.839
Other solvents and solvent mixtures	Paint thinners	0.05
Mineral-based non-chlorinated engine, gear and lubricating oils	Engine/Machine Oils	1.14
Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	Contaminated filters with spent amine, oil filters, rags and absorbents contaminated with oil	5.87
Interceptor sludge	Waste water interceptor and bunds	157.62
Mixed municipal waste	Commercial industrial waste, non-hazardous industrial waste, general waste which is not recyclable	13.548
Aqueous liquid containing substances which are not dangerous	Solvent contact sump washing	11.33
Waste paint and varnish containing organic solvents or other dangerous substances	Site wide	0.124
Waste adhesives and sealants containing organic solvents or other dangerous substances	Site wide	0.031
Packaging containing residues of, or contaminated by, dangerous substances	Empty containers (sodium hydroxide, acetone, oil containers etc)	0.487
Mixed packaging	Site wide	0.2

Waste Type	Source	Annual Quantity (Tonnes)
Metallic packaging	Site wide	0.165
Organic wastes - other than those substances which are not dangerous	Deodorizer, sprayable vapour, barrier coating antifoam	12.8
Organic wastes containing dangerous substances	Glycol/amine, ancamine 1769 curing agent, granular citric acid, dowtherm, nalco EC1005A, neutral detergent	0.431
Plastic packaging	empty ex-Zok cleaning fluid, univar blue carbuoy, wheeled plastic containers on metal frame	0.279
Paper and cardboard	Administration Building, laboratories, maintenance areas	2.37
Sulphur-containing wastes from petroleum desulphurisation	Mud with trace sulphur	0.4
Inorganic wastes containing dangerous substances	Detergent solution, arsenal, interzinc 22 powder, thermonex heat transfer compound, silica gel, non-empty caustic soda etc.	0.935
Wastes containing sulphur	Sulphur residue	0.45
Wooden packaging	Site wide	0.1
Absorbents, filter materials, wiping cloths and protective clothing containing substances which are not dangerous	. Turbines waste filters/pipes, solar turbine spent air intake filters, spillsorb, rags & absorbents contaminated with ethylene glycol, solar air intake filters	0.465
Composite packaging	Site wide	0.375
Inorganic wastes containing substances which are not dangerous	Turbine washing	0.05
Spent catalysts containing transition metals or transition metal compounds not otherwise specified	Claus CR3S spent catalyst	0.01
Wastes whose collection and disposal is subject to special requirements in order to prevent infection	Sanitary bins	0.021
Other insulating and heat transmission oils (oil - mixed)	Oil from propane refridge	0.2
Inorganic chemical processing - inorganic chemical processes not otherwise specified	Norit activated carbon sacks, spent activated carbon filter drum units	1.225

5.2 Waste Treatment/Disposal

Table 5.2 summarises waste treatment and disposal methods.

Table 5.2 - Waste Treatment and Disposal

Waste Type	Treatment/Disposal Method	Contractor
Solid hazardous waste Oil and amine contaminated filters	Treatment off-site followed by landfill, incineration or recycling	Veolia, Tradebe
Waste industrial oil	Recycled	Veolia
Waste cooking oil	Recycled	Veolia
Liquid hazardous waste Spent caustic sump waste Pig receiver sump waste Oily water sump waste	Treatment facility at Ellesmere Port (including neutralisation and blending) followed by disposal via a water treatment plant.	Veolia
Non-hazardous soild waste (general waste)	Non hazardous landfill	Veolia
Metal	Recycled	Local Contractor
Fluorescent Tubes	Recycled	Veolia
Newspapers	Recycled	Local Contractor
Organic materials (wood/grass etc)	Recycled	Veolia
Mixed construction – masonry plaster	Non-hazardous landfill	Veolia and Tradebe
Plastic cups	Non-hazardous landfill	Veolia and Tradebe
Hydrocarbon and water mixture in the closed drains collection drums	Sent offshore for re-injection	NA
Condensate	Sent offshore for re-injection	NA
Sulphur	Recycled by another industry	Univar
Cardboard paper	Recycled	Veolia
Gas cylinders	Reused	Veolia
AFFF foam for fire-fighting	Waste neutralization and filter pressed	Veolia
Solvent contactor washing	Treat and Dispose	Veolia
Portable toilet	Sewage treatment plant	Local Contractor
Spent catalyst	Neutralization, landfill	Veolia
Sodium Hydroxide ex sump	Treat and Recycle and recycled	Veolia and Tradebe

Prior to recovery or disposal off-site, solid waste is stored in the dedicated Chemical Storage Area, away from the main process activities.

Amine, caustic, solvent and glycol are all regenerated on-site.

Two types of liquid waste are collected:

1. Rainwater lightly contaminated in the pump bunds by amine/solvent/caustic, collected on site and deposited in a designated open sump for collection by an appropriate contractor.
2. Process contaminated liquid wastes amine/solvent/caustic/water are collected in designated process sumps and collected and disposed of by an appropriate contractor.

Small quantities of sludges and liquids that have been collected in designated sumps are pumped out as necessary and disposed of off-site by an appropriate contractor.

Various catalysts are used, primarily in the amine, solvent and sulphur recovery units:

- Carbon filters and catalyst canisters are changed out annually, and disposed of offsite by an appropriate contractor.
- Approximately every four years around 120 drums of solid waste catalyst from the Sulphur Recovery Unit are disposed of via a suitable waste contractor.