DIAGEO

Diageo Ireland

St. James's Gate

IE Licence Registration No. P0301-04

Annual Environmental Report 2016

March 2017

Contents

1 INTRODUCTION

1.1 Overview

Licensee:	Diageo Ireland	
Location of Activity:	St. James's Gate, Dublin 8	
Licence Register Number:	4th July 2000 – 1st June 2012	P0301-01
	1st June 2012 – 18th April 2013	P0301-02
	18th April 2013 – 12th August 2015	P0301-03
	12th August 2015	P0301-04

Diageo Ireland's St. James's Gate site is located in Dublin at National Grid Reference E310488, N233869. It covers an area of approximately 24 hectares.

Diageo Ireland was granted an Integrated Pollution Control (IPC) licence on the 4th July 2000. This licence was converted to an Integrated Pollution Prevention and Control (IPPC) Licence on 9th November 2005 through the addition of Amendment A to the licence. In June 2012, Diageo Ireland was granted a new licence, P0302-02, to accommodate the installation of a third roasting plant at the site. In August 2012, the Agency issued Technical Amendment A to the licence.

In August 2012, Diageo submitted an application for a review of licence P0301-02 to accommodate the construction of Brewhouse 4 and the associated development works. The revised licence (P0301-03) was granted in April 2013. In December 2013, the Agency amended the licence to bring it into conformity with the requirements of the Industrial Emissions Directive. Following this amendment, the licence is now referred to as an Industrial Emissions Licence.

In April 2015, Diageo submitted an application for a review of licence P0301-03 to accommodate the installation of a fourth roasting plant and the re-designation of emission points to atmosphere at Brewhouse 4. The Agency granted a new licence (P0301-04) to Diageo in August 2015. In October 2015, the Agency issued a clerical amendment (Amendment A) to the licence.

Condition 11.8 of the licence requires Diageo to prepare an Annual Environmental Report (AER) for submission to the Agency. This AER summarises the environmental performance at the site for the period January to December 2016.

1.2 Description of Activity

1.2.1 St. James's Gate Site

Diageo Ireland is engaged in brewing for the domestic and global market. The St. James's Gate site has undergone a number of capacity changes in recent years as outlined below:

- A capacity expansion programme during 2005 following the closure of the Guinness Park Royal Brewery in London in mid-2005.
- In July 2010, kegging of all ales and lagers in Diageo's Island of Ireland portfolio was transferred from the St. Francis Abbey Brewery, Kilkenny; and the Great Northern Brewery, Dundalk, to the St. James's Gate site. The logistics operations were also reorganised to cater for the increase in activity.

- Planning permission for Brewhouse 4 on the lower level of the site was granted in April 2012, following which construction commenced and commissioning activities commenced in the third quarter of 2013.
- During 2014, brewing operations were moved from the upper level of the site to Brewhouse 4.
- A fourth roasting plant was installed in 2015.

Beer is produced using traditional brewing materials: malt, barley, roast barley, hops, water and yeast. In the brew house, the raw materials are milled into coarse flour (grist), keeping the husk material as intact as possible. The milled grist is then mixed with hot water in a process known as mashing, in which the starches in the malt are converted into fermentable sugars. The porridge-like mash is transferred to a lauter tun and the sweet wort is filtered off to a third vessel, the kettle. In the kettle, hop extract is added and the wort is boiled. After boiling in the kettle the wort is decanted and pumped, with cooling en-route, to the fermentation plant.

The fermentation plant receives chilled wort directly from the brew house. Yeast is added to carry out the primary fermentation, converting the sugars in the wort into alcohol and carbon dioxide, which is a by-product of the fermentation process. Afterwards, the liquid is filtered and the green beer is matured in maturation vessels, clarified and blended to bright beer tanks for subsequent packaging in the keg plant or bulk dispatch from the tank station.

In the keg plant, beer from bright beer tanks is pasteurised before racking into kegs for distribution to the domestic and export markets, or is dispatched in bulk via tankers to packaging sites in Ireland and the UK.

Production takes place 24 hours per day, 365 days per year.

1.2.2 Beverage Blending Agents Plant

The Beverage Blending Agents (BBA) Plant consists of a brew house, evaporation / concentration unit, a storage tank farm and a packaging facility. It is designed to produce a concentrate, which is exported to over 50 countries worldwide. The concentrate is produced using malt, roast barley, yeast, hops and water and is exported in unitanks, flexitanks and road tankers via Dublin port.

1.3 Management Structures

Diageo Ireland is part of Diageo International Supply Centre, which in turn is a subsidiary of Diageo plc. The site has a structured management approach to the operation of the business in terms of product quality, environment, process control, safety and analytical capability. Management systems for quality, environment, energy, safety and food safety are audited on an on-going basis through internal audits and external third-party audits.

Registration to specific management systems has been achieved as follows:

- ISO 9001 Quality Management
- ISO 14001 Environmental Management
- OHSAS 18001 OH&S Occupational Health and Safety Management
- FSSC 22000 Food Safety Management (including ISO 22000)
- ISO 50001 Energy Management Standard

1.4 Environmental Policy

The St. James's Gate Brewery will manage its operations, products and services in a way which supports environmental sustainability and local biodiversity. It will operate in an environmentally responsible way to protect and enhance our people, brands and the communities in which we work and live. It will strive to become a truly sustainable organisation, by reducing our carbon footprint and contribute zero harm to the environment in line with our corporate strategy.

It will:

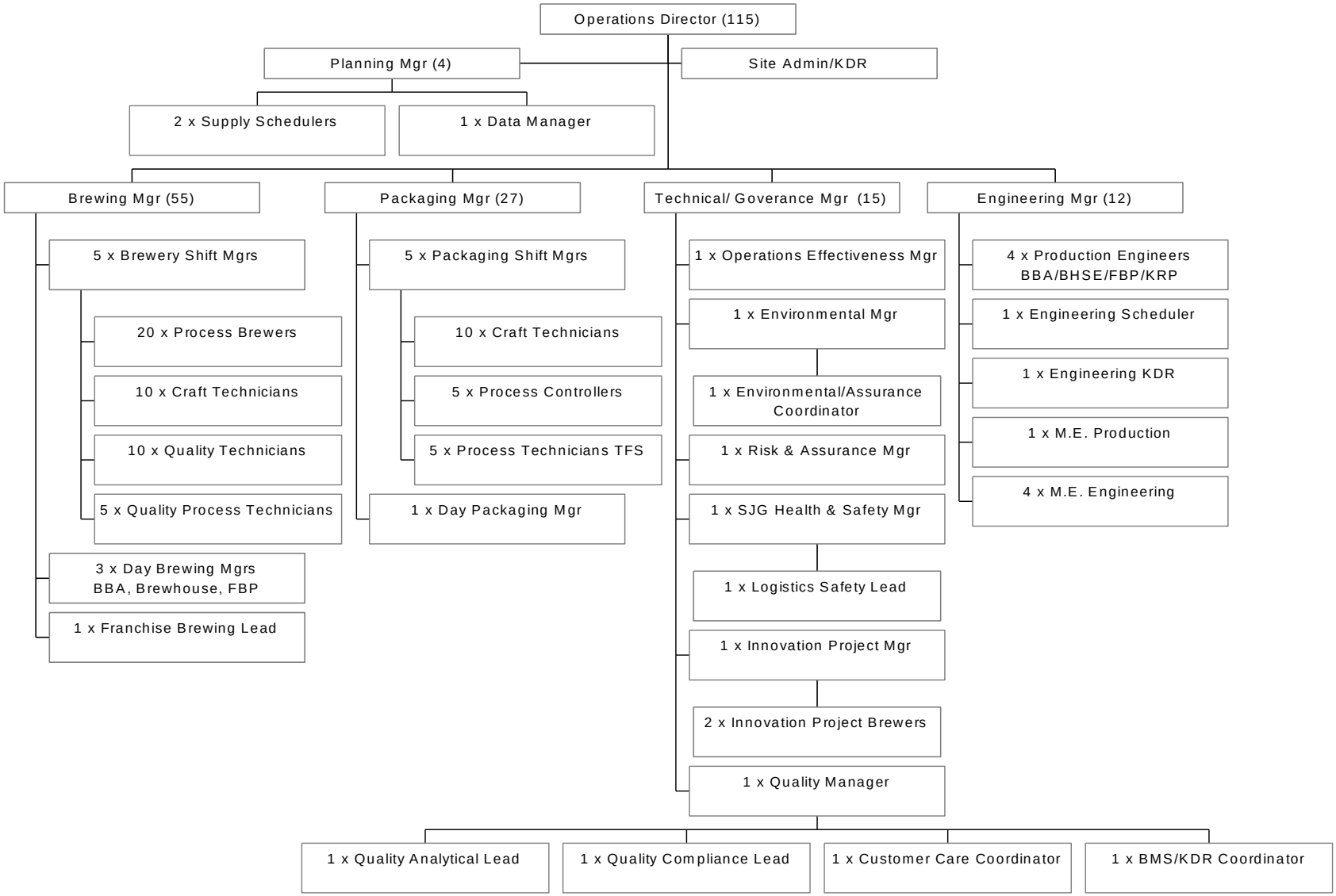
- Comply with the requirements of the Integrated Pollution, Prevention and Control licence and the Environmental management standard ISO 14001.
- Comply with all relevant Environmental legislation, legal and other requirements, that relate to the Environmental Aspects
- Have a framework for establishing and reviewing site specific KPI's which are aligned with Diageo Global KPI's
- Comply with all Diageo corporate policies and procedures, such as the Global Risk Management Standards and the Global Environmental Policy
- Maintain an effective Emergency Response & Crisis Management Procedure for the site
- Minimise energy and water use, minimise solid waste, greenhouse gas, air and effluent emissions at source and optimise CO_2 recovery.
- Optimise the use of raw materials.
- Undertake a programme of continuous improvement in environmental performance, with an emphasis on pollution prevention.
- Train and motivate employees to conduct their work in an environmentally-responsible manner.
- Ensure that adequate resources are deployed to enable the environmental policy to be implemented.
- Communicate the environmental policy to all interested parties and make it publicly available.
- Our commitment to the Environmental Policy is underpinned by the Company's core values, which include "Proud of What We Do" and "Be the Best".

Aidan Crowe
Operations Director St. James's Gate & BBA
St James's Gate Brewery
April 2016

1.5 Organisational Structures – Environmental Management

The organisational chart for the site, including the elements of environmental management, is given in Figure 1.

Figure 1: Management Structure



2 SUMMARY INFORMATION

2.1 Emissions from the Installation

Unless otherwise stated, summary information is provided for the period from January 2016 to December 2016 inclusive. The information is presented as annualised emission figures, derived from the average measured mass emission value multiplied by the duration of the emission.

2.1.1 Emissions to Sewer

2.1.1.1 Background

The following sub-sections present the site's self-monitoring data for emissions to sewer. Historically, there were three licensed emission points to sewer from the site, at SE-1, SE-2 and SE-3. Over the years, a number of changes have taken place that have resulted in changes to the nature and quantity of effluent discharged from the site.

In late 2005, the process emission from SE-2 was diverted to the waste water neutralisation plant (WWNP), ultimately discharging via SE-1. Therefore since 2006, only surface water run-off has been discharged via SE-2. The discharge of process emissions from SE-3 was also discontinued in late 2005 and only surface water run-off has been discharged from this point since then. As a result of these two changes, Diageo only operates one process emission point from the site, at SE-1. The discharges of storm water via SE-2 and SE-3 are monitored in accordance with the requirements of the revised licence. Results of the storm-water monitoring for SE-2 and SE-3 are presented in Section 2.1.2.

2.1.1.2 Overview

The licensed emission point to sewer for process effluent from the site is SE-1. The effluent is screened and then pH-adjusted in the on-site WWNP before being discharged, via SE-1, to the municipal sewer for final treatment in the Ringsend wastewater treatment plant. SE-2 and SE-3 only discharge storm water run-off to the municipal combined sewer.

Historically, Diageo has implemented an aggressive water reduction programme at the site, with the successful reductions in water consumption influencing the concentration profile of the effluent. Diageo applied for a technical amendment of the emission limit values in licence P0301-02 and this was approved by the Agency in August 2012; licence P0301-03 set the same amended limits for emissions to sewer as P0301-02.

Licence P0301-04 came into force on 12th August 2015 and introduced new emission limit values at SE-1. In addition, derogations were granted on mean volume discharged per day (averaged over a month) and the daily mean concentration of suspended solids. Both derogations were granted for a period of twelve months from the date of grant of licence P0301-04 and both Dublin City Council / Irish Water and the EPA have consented to extensions to these derogations.

All samples, other than flow, temperature and pH, are collected on a 24-hour flow-proportional composite basis and are monitored for the parameters set out in Table 1.

Table 1: Monitoring Frequency at SE-1

Continuous	Daily	Monthly	
Flow	BOD	Sulphates (as SO_4)	Ammoniacal nitrogen
Temperature	COD	Fats, oils & grease	Total oxidised nitrogen
pH	Suspended solids	Detergents (as MBAS)	Total phosphorus (as P)
		Total nitrogen (as N)	

Table 2 summarises the discharge from the main emission point to sewer, SE-1, during 2016 of BOD, COD, suspended solids, sulphates, fats, oils & grease, detergents, total nitrogen, and total phosphorous. The annual loads of these parameters were all below the limits set out in the licence.

Table 2: Emissions to Sewer for Reference Point SE-1

Parameter	Emission Quantity (2015)	Emission Quantity (2016)	Licensed Emission Note 1
Volume (m^3) Note 2	1,609,053	1,547,357	1,714,200
BOD (kg)	4,582,546	4,738,322	5,307,000
COD (kg)	7,375,047	7,368,053	8,601,000
Suspended Solids (kg)	1,220,785	1,296,833	1,244,400
Sulphates (as SO_4) (kg)	349,433	152,985	1,024,800
Detergents (as MBAS) (kg)	504	832	256,200
Fats, oils and grease (kg)	40,224	100,635	256,200
Total Nitrogen (kg)	64,040	66,010	128,100
Total Phosphorous (kg)	34,434	34,565	128,100
Parameter	**Average Concentration (mg/l) 2015**	**Average Concentration (mg/l) 2016**	**Emission Limit Value (mg/l)**
Ammoniacal Nitrogen	2.10	2.56	-
Total Oxidised Nitrogen	0.51	1.65	-

Note 1: Licensed emission quantities are based on the mean loading limits for each parameter under licence P0301-04.

Note 2: A temporary derogation was granted on the mean volume to be emitted (averaged over a month) from 4,500 m^3 to 4,800 m^3 for a period of 24 months from 12th August 2015.

2.1.1.3 Non-Compliances

Table 3 summarises the non-compliances for emissions to sewer at SE-1 in 2016.

Table 3: Non Compliances (2016)

Parameter	Non-Compliances Note 1
Volume	• None
Temperature	• None
pH	• None
BOD	• Daily mean BOD concentration between 22nd and 23rd February
COD	• None
Suspended Solids	• Annual mean suspended solid load for 2016
Sulphates	• None
Detergents	• None
Fats, Oils & Grease	• Monthly analysis of FOG concentration on 3rd May
Total Nitrogen (as N)	• Monthly analysis of total nitrogen on 1st November
Total Phosphorous (as P)	• None

Note 1: Compliance is assessed in accordance with Condition 4.3 of the licence.

2.1.2 Emissions of Storm Water

Prior to the grant of licence P0301-03 in April 2013, there was a single licensed emission point to water from the site, SW-1, together with the two former sewer emission points (SE-2 and SE-3), which now only convey storm water. Up to March 2007, emission point SW-1 discharged cooling water which originated from an underground well at the site. However, in March 2007, the discharge of cooling water ceased and only surface water from north east corner of the Lower Level is discharged via an interceptor at SW-1.

The development of the Lower Level to accommodate Brewhouse 4 introduced a second licensed emission point to water, designated as SW-2. Discharges of surface water from this new emission point commenced in July 2015.

Discharges of storm water from the four licensed emission points (SW-1, SW-2, SE-2 and SE-3) are monitored in accordance with Schedule C.2.3 of the licence, which requires daily visual inspection and pH monitoring, weekly monitoring for conductivity, and quarterly monitoring of COD and suspended solids. In October 2013 Diageo submitted its proposal for the establishment of trigger values for storm-water discharges, and the proposal was accepted by the Agency. The flow of storm water to SE-3 has been diverted to SE-1 since January 2014.

The results from the storm-water monitoring programme are summarised in Table 4.

Table 4: Summary of Storm-Water Monitoring (2016)

Parameter	Monitoring Frequency	Average Measured Value			
		SW-1 Note 2	SW-2	SE-2	SE-3 Note 1
pH	Daily	7.65	7.46	8.22	-
Visual inspection	Daily	-	-	-	-
Conductivity (µS/cm)	Weekly	976	259	569	-
COD (mg/l)	Quarterly	-	14.7	46.1	-
Suspended Solids (mg/l)	Quarterly	41.0	125.4	57.0	-

Note 1: Storm water discharge was diverted from SE-3 to the WWNP from 31st January 2014 onwards.

Note 2: Due to low and intermittent flow at SW-1, it was not possible to obtain a representative sample from the emission point.

2.1.3 Emissions to Atmosphere

2.1.3.1 Overview

The following subsections summarise the emissions to atmosphere from the licensed emission points:

- the combined heat & power (CHP) plant (A1-3, A1-4, A1-5, A1-6 and A1-7)
- the afterburners at the roasthouse (A2-1, A2-2, A2-6 and A2-18)
- the cooling stacks at the roasthouse (A2-7, A2-8, A2-9 and A2-19)
- the grain intake area on the upper level (A2-3, A2-4 & A2-5)
- the grain handling systems at the raw material handling building on the lower level (A2-10, A2-11, A2-12, A2-13, A2-14 and A2-17)

2.1.3.2 Combined Heat & Power Plant

There are three main emission points associated with the CHP turbines (A1-3, A1-4 and A1-5). There is also a bypass stack on Turbine 1 (A1-6) and a stand-by boiler (A1-7). Licence P0301-04 requires that the emission from the five CHP plant emission points be monitored for nitrogen oxides and, from 1st January 2016 onwards, carbon monoxide on an annual basis.

Monitoring of the emissions was carried out in May 2016. Table 5 summarises the monitoring results.

Table 5: Emissions of NO_X from CHP Plant (2016)

Emission Point	NO_X Concentration (mg/Nm^3)	Licence Limit (mg/m^3)	Mass Emission (kg) Note 1	Licence Limit (kg/year)
A1-3	33.67	75	13,439	41,209
A1-4	39.96	75	12,300	41,209
A1-5	69.12	75	18,319	41,209
A1-6 Note 2	53.23	75	7,082	41,209
A1-7	61.05	66	61	13,792

Note 1: The mass emission is based upon the measured concentration, the maximum volumetric flow rate and the operational hours for each stack.

Note 2: A1-6 is the bypass stack on Turbine 1 (A1-3) and only operates at low load.

Table 6: Emissions of CO from CHP Plant (2016)

Emission Point	CO Concentration (mg/Nm^3)	Licence Limit (mg/m^3) Note 1	Mass Emission (kg) Note 2	Licence Limit (kg/year) Note 1
A1-3	3.02	100	1,205	54,945
A1-4	1.37	100	422	54,945
A1-5	2.77	100	734	54,945
A1-6 Note 3	78.09	100	10,390	54,945
A1-7	0.22	100	0.2	20,897

Note 1: The licence limits for CO apply from 1st January 2016.

Note 2: The mass emission is based upon the measured concentration, the maximum volumetric flow rate and the operational hours for each stack.

Note 3: A1-6 is the bypass stack on Turbine 1 (A1-3) and only operates at low load.

There were no non-compliances of emissions to atmosphere from the CHP plant during 2016. Table 7 summarises the historical performance of the CHP plant.

Table 7: CHP Plant Summary (2016)

	2013	2014	2015	2016
NO_X emissions (kg)	48,088	53,120	45,677	51,201
Energy input (MWh)	272,630	274,303	273,233	268,957
Electricity generated (MWh)	64,170	64,919	64,031	62,645
CO_2 emissions (tonnes)	52,725	50,734	49,741	49,563

2.1.3.3 Roasthouse

There are four licensed emission points from the afterburners at the roasthouse (A2-1, A2-2, A2-6 and A2-18), each of which is monitored for total organic carbon and nitrogen oxides. Monitoring at emission points A2-1, A2-2 and A2-6 is carried out on an annual basis. The monitoring results are summarised in Table 8 and Table 9.

Roaster 4 (A2-18) underwent a commissioning test programme in October and November 2015; the results of this programme were reported to the Agency. Roaster 4 was in limited operation in 2016; once it enters service, monitoring at emission point A2-18 will be carried out on a quarterly basis.

Table 8: Emission of Total Organic Carbon (TOC) from Afterburners (2016)

Emission Point	TOC (as C) (mg/m^3)	Licence Limit (mg/m^3)	Mass Emission (kg)	Licence Limit (kg)
A2-1	39.4	40	1,020	1,894
A2-2	48.6	75	1,230	3,551
A2-6	96.2	50	1,516	3,514

Table 9: Emission Nitrogen Oxides (as NO_2) from Afterburners (2016)

Emission Point	NO_x (as NO_2) (mg/m^3)	Licence Limit (mg/m^3)	Mass Emission (kg)	Licence Limit (kg)
A2-1	59.4	61	1,536	2,888
A2-2	55.3	75	1,399	3,551
A2-6	38.0	75	598	5,270

There were no non-compliances attributable to A2-1, A2-2, A2-6 or A2-18 during 2016.

The cooling stacks associated with each of roaster 1, 2, 3 and 4 (A2-7, A2-8, A2-9 and A2-19, respectively) are monitored for total particulate matter on an annual basis. Due to a delay in carrying out monitoring during 2015, A2-7 and A2-8 were monitored twice in 2016 (March and August). Monitoring was carried out at A2-9 in October 2016. Once roaster 4 enters service, A2-19 will be monitored in accordance with requirements of the licence.

The concentration and mass emissions of particulate matter at the roaster cooling stacks in 2016 are presented in Table 10.

Table 10: Emission to Atmosphere from Roaster Cooling Stacks

Emission Point	Total Particulate Matter (mg/m^3)	Licence Limit (mg/m^3)	Volumetric Flow Rate (m^3/h)	Licence Limit (m^3/h)	Mass Emission (kg/year)	Licence Limit (kg/year)
A2-7	10.07	20	8,183	15,000	80.9	2,635
A2-8	5.31	20	7,988	15,000	43.4	2,635
A2-9	3.7	20	9,642	15,000	37.1	2,635

2.1.3.4 Grain Intake & Handling

There are three licensed emission points at the grain intake area on the upper level (A2-3, A2-4 & A2-5) and six licensed emission points at Brewhouse 4 on the lower level (A2-10, A2-11, A2-12, A2-13, A2-14 and A2-17). The results of the annual monitoring are summarised in Table 11. The operational hours and mass emissions relating to grain intake emission points on the upper level (A2-3, A2-4 and A2-5) have reduce significantly since 2014. Monitoring of these points was due to

take place in late 2016, but was delayed until early 2017. A second round of monitoring will be carried out later in 2017.

Table 11: Emission of Total Particulate Matter (TPM) from Grain Intake & Handling (2016)

Emission Point	TPM (mg/m^3)	TPM Licence Limit (mg/m^3)	Volumetric Flow Rate (m^3/h)	Flow Rate Licence Limit (m^3/h)	TPM Mass Emission (kg/year)	TPM Licence Limit (kg/year)
A2-3	0.52	50	19,271	28,900	1.0	12,693
A2-4	0.46	50	20,319	24,450	0.9	10,738
A2-5	0.53	50	17,696	14,650	0.9	6,434
A2-10	2.99	30	30,135	33,000	599.7	8,696
A2-11	0.37	30	18,919	20,000	46.6	5,270
A2-12	0.28	30	17,894	20,000	23.6	5,270
A2-13	0.36	30	8,841	13,000	7.4	3,426
A2-14	0.58	30	19,370	20,000	10.1	5,270
A2-17	0.3	30	604	2,200	0.4	580

2.1.4 Waste Management Record

Condition 11.9 of the licence requires Diageo to maintain a waste register to record the following details:

1. the tonnages and European Waste Code (EWC) for the waste materials sent off-site for disposal / recovery;
2. the names of the agent and carrier of the waste, and their waste collection permit details, if required (to include issuing authority and vehicle registration number);
3. details of the ultimate disposal / recovery destination facility for the waste and its appropriateness to accept the consigned waste stream, to include its permit / licence details and issuing authority, if required;
4. written confirmation of the acceptance and disposal / recovery of any hazardous waste consignments sent off-site;
5. details of all waste consigned abroad for Recovery and classified as 'Green' in accordance with the EU Shipment of Waste Regulations (Council Regulation EEC No. 1013/2006, as may be amended). The rationale for the classification must form part of the record;
6. details of any rejected consignments;
7. details of any approved waste mixing;
8. the results of any waste analyses required under Schedule C: Control & Monitoring, of this licence; and
9. the tonnage and EWC Code for the waste materials recovered/disposed on-site.

The hazardous and non-hazardous waste consignments from the site in 2016 are presented in Table 12. There were no rejected consignments in 2016.

During 2012, Diageo notified the Agency that a number of the materials generated as part of the brewing / production process met the requirements of Article 27 of the *European Communities (Waste Directives) Regulations* 2011. As a result, Diageo submitted determinations of by-product status for the following materials, which were accepted by the Agency:

- spent grain (pale or black) destined for use as animal feed;
- black spent grain destined for use as compost;
- grain dust destined for use as compost;
- surplus yeast destined for use as animal feed;
- discarded beer destined for use as animal feed or application on willow plantation as an organic fertiliser; and
- trub destined for use as animal feed or as compost.

Table 12: Summary of Waste Consignments from the Site in 2016

EWC	HAZ (Y/N)	Description of waste	Quantity (tonnes)	Method of disposal/ recovery	Location of disposal / recovery	Facility Licence / Permit
02 07 04	N	Spent activated carbon	17.7	R13	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02
11 01 14	N	Degreasing wastes other than those mentioned in 11 01 13	0.18	R13	Safety Kleen Unit 5 Airton Road Tallaght Dublin 24	W0099-01
15 01 01	N	Cardboard	37.4	R3	Padraig Thornton Waste Disposal Limited Unit 51 Henry Road Park West Business Park Dublin 12	WFP-DC-10-0021-02
17 02 01	N	Wood	51.8	R3	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02
17 05 04	N	Sand	8.08	R5	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02

EWC	HAZ (Y/N)	Description of waste	Quantity (tonnes)	Method of disposal/ recovery	Location of disposal / recovery	Facility Licence / Permit
17 09 04	N	C&D waste	1,371	R5	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02
19 09 02	N	Sludges from water clarification	8.08	R13	Enva Ireland Clonminam Industrial Estate Portlaoise Co. Laois	W0184-01
19 12 02	N	Ferrous metal	43.3	R4	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02
20 01 01	N	Paper	17.4	R3	Padraig Thornton Waste Disposal Ltd. Unit 6 S3B Henry Road Park West Business Park Dublin 12 Co. Dublin	WFP-DC-11-0023
20 01 08	N	Organic compost	170.3	R3	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02

EWC	HAZ (Y/N)	Description of waste	Quantity (tonnes)	Method of disposal/ recovery	Location of disposal / recovery	Facility Licence / Permit
20 03 01	N	Mixed municipal waste	197.4	R1	Padraig Thornton Waste Disposal Limited Thorntons Recycling Centre Killeen Road Ballyfermot Dublin 10	W0044-02
20 03 01	N	Dry mixed recyclables	44.2	R3	Padraig Thornton Waste Disposal Limited Unit 51 Henry Road Park West Business Park Dublin 12	WFP-DC-10-0021-02
08 01 11	Y	Empty unclean packaging, paint related material	0.2	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
11 01 13	Y	Degreasing wastes containing dangerous substances	0.09	R13	Safety Kleen Unit 5 Airton Road Tallaght Dublin 24	W0099-01
13 02 08	Y	Other engine, gear and lubricating oils	3.8	R9	Enva Ireland Clonminam Industrial Estate Portlaoise Co. Laois	W0184-01
13 05 08	Y	Waste from interceptors	25.4	R9	Enva Ireland Clonminam Industrial Estate Portlaoise Co. Laois	W0184-01

EWC	HAZ (Y/N)	Description of waste	Quantity (tonnes)	Method of disposal/ recovery	Location of disposal / recovery	Facility Licence / Permit
15 01 10	Y	Packaging containing residues of or contaminated by dangerous substances	4.63	R13	SRCL Unit 1A Allied Industrial Estate Kylemore Road Dublin 12	W0054-02
15 01 10	Y	Packaging containing residues	0.70	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
15 01 10	Y	Empty ink cartridges	0.66	D10	Abfall Verwertungs Gesellschaft Gmb Borigstrasse 2 D-22113 Hamburg Germany	11/05/2005 IB2234/AVG-GENB-2,
15 02 02	Y	Filters	15.0	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
15 02 02	Y	Absorbents, filter materials (including oil filters not otherwise specified)	0.93	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
16 03 03	Y	Waste hydrochloric acid	6.0	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
16 05 06	Y	Laboratory chemicals	2.04	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089

EWC	HAZ (Y/N)	Description of waste	Quantity (tonnes)	Method of disposal/ recovery	Location of disposal / recovery	Facility Licence / Permit
16 05 06	Y	Waste flammable liquid, methanol and phosphoric acid	1.0	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
16 05 08	Y	Discarded organic chemicals consisting of or containing dangerous substances	1.0	R1	Lindenschmidt Umweltservice Krombacher Strasse 42-46 Kreutzal D-57223 Germany	EFB No. 04 714 98089
17 05 03	Y	Cat D soil	17.7	R5	TerraCon Gmbh Hovestr. 74 – 76 20539 Hamburg Germany	EG0102

2.2 Monitoring and Enforcement

2.2.1 Agency Visits

The Agency conducted a visit to the site on 7th October 2016. The site visit report was issued by the Agency on 3rd November 2016; it identified one non-compliance and seven observations. Diageo is progressing corrective actions arising from the report.

On 10th November 2016, the Agency conducted a visit to the site in response to an incident reported by Diageo to the Agency, Ref No. INCI011116: an electrical fire (of approximately one hour duration) in the palletised area of the kegging plant that occurred on 9th November 2016. The site visit report was issued by the Agency on 20th December 2016; it did not identify any observations or non-compliances.

2.2.2 Agency Monitoring – Emissions to Sewer

The Agency visited the site in February and December, and collected split composite samples from emission point SE-1. Temperature and pH readings were taken from a grab sample at SE-1. The results of these samples are summarised in Table 13. There was an exceedance of the total nitrogen licence limit during the February and December monitoring.

Table 13: EPA Grab Samples at SE-1 (2016)

Parameter	February	December	P0301-04 Licence Limit
Temperature (C°)	-	13.6	42
pH	8.1	7.2	6 – 10
BOD (mg/l)	400	3,200	6,000
Conductivity (µS/cm)	2,320	3,020	-
COD (mg/l)	6,380	5,170	11,100
SS (mg/l)	950	Nr	1,700 Note 1
Sulphate (mg/l)	360	110	400
Total nitrogen (mg/l)	96	72	50
Total phosphorus (mg/l)	20	19	50

- Parameter not measured by the EPA.

nr Parameter not reported by the EPA.

Note 1: Diageo has been granted a derogation for the SS daily limit from 1,400 mg/l to 1,700 mg/l for a period of 24 from date of grant of P0301-04

2.2.3 Third-party audits

Certification Europe carried out a surveillance audit on the Environmental Management System in 2016. The auditor determined that Diageo's management system continues to conform to the requirements of ISO 14001.

2.3 Energy and Water Consumption

2.3.1 Energy Audit

A comprehensive energy review which encompassed electricity, steam, water, compressed air and process gases (nitrogen & CO_2) was undertaken in the final quarter of 2016. This exercise was carried out in accordance with Conditions 7.1, 7.2 &7.3 of the IE licence (P0301-04).

The review concluded that despite the increase in brewing at St James Gate over recent years with the closure or Breweries in Dundalk and Kilkenny there has not been a corresponding increase in electricity demand. Steam usage has also decreased with the adoption of efficient energy management system in the new Brewhouse. The review has identified a number of potential energy, water and process gas efficiency opportunities which we plan to further investigate. Diageo added the initiatives to its opportunities register, which is managed as part of the Energy Management System.

A comprehensive metering, sub-metering, data collection and reporting system has been in place at the site, this has been updated with the addition of the new BBA on the lower level

2.3.2 Energy Consumption

Steam and electricity are generated in the Combined Heat and Power (CHP) Plant operated on site by GatePower. In addition, Diageo imports electricity from the grid. Table 14 summarises the energy consumption at the site in 2016, while Table 15 summarises the energy inputs to and outputs from the CHP plant.

Table 14: Energy Consumption (MWh) (2016)

Energy Source	2014	2015	2016
Natural Gas for CHP plant	274,303	272,817	268,923
Natural Gas for roasthouse	15,508	18,694	16,850
Total Natural Gas	*289,811*	*291,511*	*285,773*
Gasoil for CHP plant	140	443	34
Diesel / gasoil for logistics	3,086	3,077	3,575
Electricity imported from the grid	583	211	117
LPG for forklift trucks	409	386	343
Total Site Energy Consumption	**294,029**	**292,807**	**289,843**

Table 15: Summary of Energy Inputs to and Outputs from the CHP Plant (MWh) (2016)

Energy Source	2014	2015	2016
Inputs			
Natural Gas for electricity exported to grid	*38,571*	*54,828*	*22,244*
Natural Gas for electricity & steam exported to the site	*235,732*	*236,683*	*246,679*
Total Natural Gas input	274,303	291,511	268,923
Outputs			
Electricity exported to the grid	*18,134*	*15,961*	*14,351*
Electricity exported to the site	*46,785*	*48,070*	*48,294*
Total electricity generated	64,919	64,031	62,645
Steam exported to the site	122,458	118,608	105,007

As noted in Section 2.3.1, an energy audit was completed in 2016. As noted in Section 1.1, Diageo operates an Energy Management System certified to ISO 50001, which is used to manage energy consumption and the efficient use of energy across the site.

2.3.3 Water Consumption

Both potable and service water is supplied to the site by Dublin City Council. In 2013, Diageo invested in a water treatment plant that utilises water extracted from the Cooperage Well, located at the site, to provide additional potable water. Potable Water is used during the brewing process. Service Water is used in fire hoses and other ancillary activities. Specific water consumption at the site is summarised in Table 16.

Table 16: Water Usage (2016)

Year	Total (hl/hl)
2012	3.1
2013	3.6
2014	3.7
2015	3.0
2016	3.1

2.4 Environmental Incidents and Complaints

2.4.1 Environmental Incidents

Table 17 summarises the environmental incidents that occurred during 2016, setting out the cause and corrective action, and identifying the relevant authorities that were notified of the incident.

Table 17: Environmental Incidents (2016)

Date	Description	Authorities contacted
January	None	
February	On 22nd February, the BOD concentration at SE-1 was found to be in excess of 1.2 times the ELV. The elevated level was found to be due to a shock load of process effluent from the FBP to the WWNP. Diageo implemented corrective action.	EPA Dublin City Council
March	None	-
April	None	-
May	A 24-hour composite sample from SE-1 is analysed for fats, oils and grease (FOG) on a monthly basis. Analysis of a sample collected on 3rd May found a concentrations in excess of 1.2 times the ELV. Following extensive investigation by Diageo, no source of the exceedance was identified. Split effluent samples were dispatch to three laboratories; it was found that the laboratory sub-contracted to analyse FOG was reporting concentrations that were inconsistent with results from other laboratories and those from Dublin City Council. Diageo has since changed the analysis laboratory for FOG.	EPA Dublin City Council Irish Water
June	None	-
July	None	-
August	None	-
September	None	-
October	None	-
November	On 9th November, a small electrical fire occurred in the palletiser area of the kegging plant. The Diageo first response team and Dublin City Fire Brigade responded to the incident. The fire was extinguished using CO_2; no contaminated firewater was generated and following the incident the residue from the fire was collected and disposed of. It was determined that water from a keg cleaning operation had entered the electrical panel and caused the fire. The electrical panel was reinstated in another location, separated from the wet process areas. Three monthly analyses of total nitrogen concentration at SE-1 (September, October and November) were found to be above the ELV but below 1.2 times the ELV. The mass emission of total nitrogen was significantly below the ELV. The elevated concentrations of nitrogen were determined to be due to the protein content of the grain being processed.	EPA Dublin City Council Irish Water EPA Irish Water
December	The annual mean load per day of suspended solids at SE-1 was found to be in excess of the ELV. There were no exceedances of the daily mean load of suspended solids during 2016.	EPA

2.4.2 Environmental Complaints

In 2016, there were 12 incidents that gave rise to complaints. Table 18 summarises the complaints received, the identified cause and the corrective actions taken.

Table 18: Summary of Complaints Received in 2016

Date	Complaint	Cause	Corrective Action
3rd August 2016	A neighbour made a complaint regarding noise on the upper level in an area adjacent to James Street.	On investigation it was found that there was a roller door left open associated with the Open Gate Brewery. There are pumps running inside this area which are thought to have given rise to the noise described by the complainant.	Open Gate Brewery Manager was contacted and advised of the complaint. A system has been put in place to limit the time the door is opened.
27th April 2016	A neighbour in the Marrowbone Lane area made a complaint in relation to noise from the roast house	No unusual activity was being undertaken in the area, however the noise attenuation wall was not completed at the time.	Continue with installation of noise attenuation wall.
2nd June 2016	A neighbouring business made a complaint regarding construction type noise in the roast house area of the site.	On investigation, it was found that the noise generated was associated with the construction of a noise attenuation wall for the roast house.	Activity was short duration and associated with construction of noise attenuation measures. Diageo will advise neighbours in advance if there is to be any construction type noise occurring in the area.
7th June 2016	A neighbour in the Steevens Gate apartments made a complaint regarding the noise associated with the stacking of kegs in the yard.	The site Packaging Shift Manager investigated the complaint and found that empty kegs were being stacked at the time. The method the fork lift driver was using to stack the keg was giving rise to the noise.	The FLT was stood down and a toolbox talk on noise was given to all fork lift drivers in the area.
24th July 2016	A resident at Victoria Quay made a complaint in relation to an alarm type sound coming from the Brewery.	On investigation it was found that a CO_2 alarm (a critical safety device) was alarming during a CIP. There is a klaxon on the external façade of the building where the alarm was sounding.	The klaxons on the external façade of the buildings were replaced with lower sound power level units. This will reduce any noise heard outside of the site boundary should the alarm activate.
29th July 2016	A neighbour on Watling Street reported a loud noise of short duration.	It was found that an insurance inspection was being undertaken and as a result steam was blown off for a short duration.	The CHP operator will limit any future blow offs to the minimum requirement. The neighbour will be advised prior to planned steam blow off occurring.

Date	Complaint	Cause	Corrective Action
30th August 2016	A resident on Victoria Quay made a complaint regarding a large fan type noise.	An investigation was undertaken across all production and utility areas however nothing unusual was identified which would give rise to a fan type noise.	No source found.
24th September 2016	A neighbour on Victoria Quay made a complaint in relation to an alarm type sound coming from the Brewery.	On investigation it was found that a CO_2 alarm (a critical safety device) was alarming during a CIP. There is a klaxon on the external façade of the building where the alarm was sounding. This had not been identified during a review of external alarms following the complaint in July.	The klaxon on the external façade of the building was replaced with a unit with lower sound power level to limit any noise heard offsite should it be activated.
15th October 2016	A resident on Watling Street raised a complaint regarding noise from the tank station.	A roller door at the tank station was open due to damage to the control mechanism.	Damaged cables were repaired and the door was returned to service.
24th October 2016	A resident in Marrowbone Lane made a complaint in relation to noise from the roast house.	An investigation was undertaken in the area and no unusual activity was identified.	No source found.
20th November 2016	A resident in Marrowbone Lane made a complaint In relation to noise from the roast house area.	While the noise attenuation wall has reduced the noise during night time periods, it has not delivered the noise reduction that was envisaged.	Roasting on roaster 4 during night time periods has been limited, and an investigation to identify what additional controls could be put in place to reduce the noise emission has been initiated.
11th December 2016	A resident on Watling Street raised a complaint regarding noise from the tank station.	At the time of the complaint there was a fault with one of the acoustic doors at the tank station.	The fault, which was causing the door to be kept in the open position, was fixed.

2.5 European Pollutant Release and Transfer Register (E-PRTR)

The European Pollutant Release and Transfer Register for the site is attached in Annex 1 to this report. An electronic copy of the E-PRTR was uploaded to the Agency's website prior to submission of this Annual Environmental Report.

3 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS

3.1 Environmental & Energy Management Plan

The site is certified to the international standard for Environmental Management Systems (ISO 14001) and for Energy Management System (ISO 50001). The Environmental & Energy Management Plan (EEMP) is a combined plan covering both environmental and energy targets. It defines a set of objectives and targets for the company to work towards. Of its nature, it is liable to alteration in the light of changing circumstances and the company's future plans. It is also subject to revision from time to time and proposals, plans, targets and goals may vary accordingly. Therefore, progress on a particular objective or target is subject to change. Progress on the objectives and targets achieved during the previous year is reported in the Annual Environmental Report.

In addition to the EEMP, a register of opportunities (or ideas log) is maintained for potential energy usage, resources, water and effluent reduction initiatives as part of the management systems.

The EEMP is prepared in accordance with the requirements of ISO 14001, ISO 50001 and with the conditions of the site's licence. It has also been developed taking into account the Agency's guidance, the register of environmental aspects and impacts, the register of energy aspects and impacts, and in particular the significant impacts identified in these registers.

3.2 Environmental & Energy Management Programme

This section sets out the EEMP for the site. The programme is broken down into a number of categories as follows.

1. Soil, surface water and groundwater
2. Emissions to atmosphere
3. Waste reduction
4. Management and control of effluent discharges
5. Noise
6. Resource usage
7. Energy usage
8. Sustainable development of the site

For each of these headings the following information is outlined.

- Objective
- Rationale behind objective
- Specific target to achieve objective
- Plan to achieve targets
- Timescale
- Person(s) / department(s) responsible

3.2.1 Report on Environmental & Energy Management Programme for 2016

The following tables provide a report on the EEMP for 2016.

Objective 1.0	To protect soil, surface waters and groundwater from pollution.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Licence Reg. No. P0301-04.
Five Year Programme	As part of recent site redevelopment, significant new infrastructure, including process and surface water drainage systems in the Lower Level, were implemented. These systems are being incorporated into the maintenance plans for the site. Additionally, the site will continue to investigate the localised groundwater issue at MW8 and implement the agreed corrective actions.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
1.1	Complete the corrective actions outlined in the 'Interim Report on Contamination Encountered in MW8 at St. James's Gate' dated 31st January 2013.	URS /AECOM to monitor the groundwater condition at MW8 and evaluate the impact of corrective actions taken on behalf of Diageo.	2016 - 2017	Environmental Manager	Lower Site	Both rounds of biannual monitoring have been completed, some final works are being undertaken as part of the drain repair programme for the FBP in Q1 2017.
1.2	To protect soil, surface waters and groundwater from contamination from materials stored on the site.	Develop a drains register and formally track maintenance and testing of drains. Continue the drain relining capex project.	2016 - 2017	Engineering Manager	Overall Site	Drain register has been prepared, this will remain a live document for the site and will be updated on an as required basis.
1.3	Implement the recommendations in the 2014 EPA Site Inspection report in relation the integrity of hard standing areas where raw materials are delivered	Review the register of hard standing areas and submit a capex proposal to the business. Using a risk based approach, carry out repairs of hard standing areas.	2016 2017 - 2018	Engineering Manager	Lower Site	Hard standing Register has been completed. Priority areas are being identified which will allow a CAPEX form to be developed.

Objective 1.0	To protect soil, surface waters and groundwater from pollution.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Licence Reg. No. P0301-04.
Five Year Programme	As part of recent site redevelopment, significant new infrastructure, including process and surface water drainage systems in the Lower Level, were implemented. These systems are being incorporated into the maintenance plans for the site. Additionally, the site will continue to investigate the localised groundwater issue at MW8 and implement the agreed corrective actions.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
1.4	Continue to monitor trend in ground water monitoring at MW13 to evaluate the integrity of the well. Zinc concentration remains elevated at MW13, groundwater monitoring results and observations suggest that water quality at this location is being influenced by the mixing of groundwater with the brackish surface water in the River Liffey.	Continue to monitor the trend on groundwater sampling results.	2016	Environmental Manager	Lower Level	Continued to monitor trends – no significant shift, results are similar to those in 2016.
1.5	Update the site drawings to incorporate the new development and site layout.	Drawings provided by ARUP in 2015 to be reviewed for completeness in 2016 e.g. invert levels, decommissioned drains, new drains as part of new development on site.	2016	Engineering Manager	Overall Site	Drawings have been prepared based on all available information. Site drawings will remain live and will be updated as new information becomes available.
1.6	Inspection and repairs of concrete bunds	Ensure the inspections are completed on time and repairs completed as required e.g. bund 067.	2016	Engineering Manager	Overall Site	Bund #67 has been repaired – significant structural works completed & addition of impermeable liner.
1.7	GFE storage location calamity procedures in the event of a spill	Review the drainage system and develop a SOP to manage a spill	2016	Environmental Manager	Upper site	Spill control measures in place.

Objective 2.0	To improve control of air emissions from the site.
Rationale	Specific requirements relating to the control of air emissions are contained in Diageo Ireland IPPC Licence Reg. No. P0301-04.
Five Year Programme	To complete all outstanding actions from the test programmes for abatement systems as required under the Licence. Continue to manage and drive improvements for all emissions on site.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
2.1	Provide data necessary to accurately calculate CO2 emissions from oxidation of TOC in roaster afterburners	Carry out on and off gas monitoring of all roasters to demonstrate TOC load presented to the afterburners and the efficiency of the afterburners in oxidising the TOC across the process	2016	Contracts and Utility Manager	Engineering	On and off gas analysis completed together with literature review of performance. Completed as part of EUETS reporting in 2016.
2.2	Control of air emissions from new equipment on site	Introduce monitoring program for Roaster 4 and additional BH4 emission points post approval of the test program from the EPA.	2016	Environmental Manager	Technical support	EPA Test programme has been approved, monitoring schedule has been developed and for 2016 – contractors appointed to complete.
2.3	To implement final phase of programme to remove all R22 gas air conditioning units from Dublin Brewery in line with legislation	Ensure any remaining R22 units are not maintained or serviced. Remove all remaining units on phased basis and replace with new units or decommission air conditioning units.	2016	Facilities	Overall site	No plant containing R22 is being maintained at SJG.

Objective 2.0	To improve control of air emissions from the site.
Rationale	Specific requirements relating to the control of air emissions are contained in Diageo Ireland IPPC Licence Reg. No. P0301-04.
Five Year Programme	To complete all outstanding actions from the test programmes for abatement systems as required under the Licence. Continue to manage and drive improvements for all emissions on site.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
2.4	To continue to monitor and reduce fugitive emissions on the site	To continue to report any fugitive emissions on site as part of the H&NM reporting system and to implement any repairs as required. To continue with the pipeline assessments to monitor for fugitive emissions and implement repairs where necessary To implement recommendations in the Fugitive emissions study for the site.	2016 - 2020	Environmental Manager	Overall site	In progress – fugitive emissions for the site have been reduced as part of decommissioning of operational areas on the upper level.

Objective 3.0	To minimise waste on site.
Rationale	In line with Diageo Corporate Goals, St James's Gate strives to achieve zero waste to landfill. Specific requirements relating to the management of waste are also contained in Licence Reg. No. P0301-04.
Five Year Programme	Diageo at SJG has achieved a monthly target of zero waste to landfill on a regular basis throughout 2015. This remains the garget for 2016 and thereafter Diageo intends to sustain this performance.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
3.1	Ensure that zero waste to landfill achieved each month for 2016	Continue to build awareness of the principles of Reduce, Reuse, and Recycle. Work with waste contract companies to ensure waste is routed away from landfill.	2016	Environmental Manager Facilities	Overall Site	No waste sent to landfill to date in 2016. Approval systems for all waste diverted off the site reiterated to all Diageo & 3rd party personnel.
3.2	To continue auditing waste contractors who remove waste material from the site.	Continue with the ongoing programme for the auditing of waste contractors.	2015	ISC Supplier Audit Co-Ordinator (CR)	Overall site	Audits of hazardous waste contractors completed in Q1 2017.

Objective 4.0	To improve the management and control of effluent discharges from the site.
Rationale:	In line with good environmental practice and in response to our engagement process with DCC, Diageo Ireland is currently implementing a re-invigorated and targeted effluent reduction programme on site. Furthermore, specific requirements relating to control of effluent are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Historically, Diageo has delivered substantial reductions in effluent discharges from the site. The site recently underwent significant changes with Brew house 4 development and the transition of volume from SFAB and GNB, which includes brewing new products at SJG and increased volumes. Following the commissioning and optimisation of Brew house 4, Diageo will complete an assessment of effluent levels from the new operations and develop a register of opportunities to further decrease effluent. Diageo will continue to implement a committed programme to reduce effluent.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
4.1	Diageo will engage with the Agency and DCC regarding the agreement of revised ELV limits at SE-1 prior to August 2016	Diageo to work closely with IW and DCC during Q1 and Q2 2016 specifically in relation to SS and Flow ELV's Diageo will assess the concentration and loadings of the effluent discharged to SE1 given BH4 is now fully operational (albeit the new BBA will not be complete until Q2 2016.) If appropriate, and with the agreement of IW and DCC, Diageo will prepare a submission to the Agency for appropriate limits to be incorporated into the licence.	2016	Environmental Manager	Technical Support Team	Temporary derogation on flow and suspended solids was approved by IW & EPA in July 2016 We are continuing to work closely with IW on discharges made from SJG to the sewer network.
4.2	Provide DCC/IW with data through batch file transfer at intervals to be determined and agreed with DCC/IW.	Continue to supply data as agreed in monthly meetings with DCC/IW	2016	Environmental Manager	Technical Support Team	We are continuing to provide data to DCC/IW on a monthly basis.

Objective 4.0	To improve the management and control of effluent discharges from the site.
Rationale:	In line with good environmental practice and in response to our engagement process with DCC, Diageo Ireland is currently implementing a re-invigorated and targeted effluent reduction programme on site. Furthermore, specific requirements relating to control of effluent are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Historically, Diageo has delivered substantial reductions in effluent discharges from the site. The site recently underwent significant changes with Brew house 4 development and the transition of volume from SFAB and GNB, which includes brewing new products at SJG and increased volumes. Following the commissioning and optimisation of Brew house 4, Diageo will complete an assessment of effluent levels from the new operations and develop a register of opportunities to further decrease effluent. Diageo will continue to implement a committed programme to reduce effluent.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
4.3	Maximise surface water discharges through SW1, SW2 and SE3 and monitor the emissions accordingly.	Monitor SW1 and SW2 flows given commissioning completed in 2015. Complete commissioning of telemetry on SE3 Review trigger limit values and engage with DCC/IW and the EPA as appropriate.	2016	Environmental Manager	Technical Support Team	SW-2 system in place, some builds to be completed on system in 2016 to improve management. SE3 telemetry system works to be completed. Trigger limits have been reviewed – lower limit value has been set to reflect the low pH of surface water.
4.4	Diageo will continue to implement a committed programme to reduce effluent.	Following the commissioning and optimisation of Brew house 4, Diageo will complete an assessment of effluent levels from the new operations and develop a register of opportunities to further decrease effluent.	2016	Environmental Manager	Technical Support Team	Flow meter has been installed at the BBA to understand the flow contribution from this element of the process.

Objective 5.0	To monitor the level of noise emissions on site, at the boundary of St James's Gate Site and at noise sensitive locations off site.
Rationale	In line with good environmental practice and in accordance with specific requirements relating to the noise emissions contained in Diageo Ireland Licence Reg. No. P0301-04 Diageo Ireland maintains a noise reduction programme on site.
Five Year Programme	Following the completion of the Brew house 4 development and the mothballing of existing process activities, Diageo will baseline the noise emissions at the boundary of the site. The noise reduction programme will be further developed and implemented accordingly.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
5.1	To review the level of noise at noise sensitive locations.	Noise control engineering measures identified as part of the capex project to be concluded. Following the noise control engineering works, repeat the noise map that was developed to represent the noise profile on site and assess the impact that these noise sources now have on residential receptors located towards the east of the site.	2016	Business Engineering	Lower Level	Works completed to reduce noise breakout. Post project monitoring has been undertaken, additional areas of focus have been identified.
5.2	Prepare a programme to reduce noise emissions including specific goals and a time scale, together with options for modification, upgrading or replacement.	Following the development of the 3D noise map, to represent the noise profile at the roast house in 2015, implement noise control engineering solutions as appropriate e.g. noise barrier and double insulated roller shutter door. Following the noise control engineering works, repeat the noise map that was developed to represent the noise profile on site and assess the impact that these noise sources now have on residential receptors.	2016	Business Engineering	Roasthouse	Noise attenuation wall has been installed at the Roasthouse. Noise monitoring to be completed when Roaster 4 is fully operational.

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
6.1	To baseline the chemical consumption levels of the new Brew house, BBA and Cold block and establish a continuous improvement plan for further improvements	• Minimise chemical consumption in the BBA during the commissioning phase • Maximise the recovery of chemicals during the mothballing of existing process plants • Evaluate the performance of the new process plants against expected performance levels and investigate any significant deviations • Following the transition of all volume to site from SFAB and GNB and the optimisation of the new development, complete an assessment of chemical consumption in each of the BBA, Brew house and Cold block areas. • Review the register of opportunities to reduce chemical consumption and implement a CI programme.	2016 2016 2016 2016 2016 -2018	Commissioning Team Brewing manager	BBA team Technical Support Team	In progress

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
6.2	To baseline the water consumption levels of the new development and the existing operations and establish a continuous improvement programme	• Following the closure of all operations in legacy plants throughout 2016, review the register of opportunities to reduce water consumption and track the implementation of opportunities in accordance with the accredited ISO 50001 system.	2016 - 2017	Engineering Manager Contracts & Utilities Manager	Engineering	Completed as part of the energy review. Continuous improvement process in place in all production areas.

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
6.3	To optimise the existing operations of the keg plant to sustain BAT levels for chemical and water consumption levels.	• Implement the remaining recommendations in the KHS report to reduce chemical and water consumption. • Complete an up to date water balance of the keg plant and target the largest users on a Pareto basis. • Continue to use the tools of our ISO 50001 accredited energy management system to deliver sustained reductions in water consumption. Achieve a year-on-year reduction in water consumption per keg. • Develop a program to reduce the caustic usage in external washers. • Sustain the year on year increases in keg line OEE. • Maintain KRP waste levels at < 1.5%.	2016 - 2018	Packaging Production Manager	Keg Plant	In progress

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
6.4	Optimise the Water Treatment Plant and the abstraction from the Cooperage Well.	• Upgrade well water abstraction and treatment system to increase the volume of water available from this source during 2016 and beyond. • Complete well water abstraction tests, where required, to confirm available capacity for a more widespread use of well water across the site.	2016 2016	Contracts & Utilities Manager	Utilities Manager	Upgrade on pre filtration plant complete. Water rejection on well water treatment plant reduced by 33%. Approval required from the EPA and IW/DCC on test programme for additional abstraction tests.

Objective 7.0	To improve the energy efficiency of the Brewery site.
Rationale:	Diageo Ireland maintains an Energy Management System, which is accredited to ISO 50001. As part of this system, and in line with good environmental practice, Corporate Targets and the requirements of the Licence, Diageo operates a continuous improvement programme to maximise the energy efficiency of the site and to reduce the greenhouse gas emissions from the business.
Five Year Programme	Following the completion of the new development and the transition of volume from SFAB and GNB, Diageo will baseline the energy consumption of the site. Diageo will identify further opportunities to reduce energy consumption and implement accordingly. Currently the SJG Brewery is at the same or better than the best BAT efficiencies for our sector, as outlined in the European Commission reference document on Best Available Techniques (BAT) in the food, drink and milk industries. Following the optimisation of the new process equipment on site, the transitioning of additional volume on site and the mothballing of the existing operations, SJG intends to sustain the superior performance in energy efficiency and achieve BAT levels of performance.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
7.1	Complete an independent Energy Audit of SJG in line with the Agency guidance note	Complete an independent Energy Audit of SJG in line with the Agency guidance note SJG will evaluate all of the opportunities identified in the audit report and implement where possible	2016	Contracts and Utility Manager	Engineering	Energy audit has been completed.
7.2	Manage the energy consumption of the BBA operation to minimise energy consumption and monitor against vendor KPIs.	Review the energy consumption at the ESIM meeting. Expand the meeting to evaluate the impact or changes due to the new development.	2016	Engineering Manager	Engineering	All utility usage in the BBA has been included in the ESIM.
7.3	Minimise process utility consumption on the upper level when BBA production is moved to the lower level.	Complete a full shutdown and isolation of compressed air, and refrigeration plants supplying GFE and BH3.	2016	Contracts and Utility Manager	Engineering	In progress – works are ongoing to meet this requirement (refrigeration system isolated, steam & compressed air systems isolated locally)

Objective 7.0	To improve the energy efficiency of the Brewery site.
Rationale:	Diageo Ireland maintains an Energy Management System, which is accredited to ISO 50001. As part of this system, and in line with good environmental practice, Corporate Targets and the requirements of the Licence, Diageo operates a continuous improvement programme to maximise the energy efficiency of the site and to reduce the greenhouse gas emissions from the business.
Five Year Programme	Following the completion of the new development and the transition of volume from SFAB and GNB, Diageo will baseline the energy consumption of the site. Diageo will identify further opportunities to reduce energy consumption and implement accordingly. Currently the SJG Brewery is at the same or better than the best BAT efficiencies for our sector, as outlined in the European Commission reference document on Best Available Techniques (BAT) in the food, drink and milk industries. Following the optimisation of the new process equipment on site, the transitioning of additional volume on site and the mothballing of the existing operations, SJG intends to sustain the superior performance in energy efficiency and achieve BAT levels of performance.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
7.4	Obtain a deeper understanding of energy consumption levels in the roast house.	Review the operation of each roaster production stream in conjunction with the ongoing roast quality project to identify the optimum energy consumption model that supports the production of roast material of the quality required to optimise the core production processes.	2016	Contracts & Utility Manager	Engineering	Ongoing monitoring to measure efficiency of operation on a daily and weekly basis which is linked to product quality and efficient operation of the plant.
7.5	Incorporate the new operations and utility plants into the Energy Management System	Complete the documentation of the SOPs for the new process areas to ensure that the new processes are fully incorporated into the energy management system. Energy section to be added to the general SOP for Brewhouse and Cold Block.	2016	Contracts & Utility Manager	Engineering	All areas have been added to the Utilities model and are reviewed through the ESIM.

Objective 8.0	To carry out development works at the site in accordance with environmental best practice and the principles of sustainable design and development. To mitigate any potential environmental liabilities from the site.
Rationale:	It is essential that all development works at the site are undertaken in the context of the site's licence and that the construction phase and operational phase of the development are planned to minimise the environmental impact, in line with the site's Environmental Policy.
Five Year Programme	The SJG site is currently undergoing a major redevelopment project. This work will be completed in a manner to minimise the impact of the environment.

No.	Target	Plan	Time scale	Responsibility	Department	Comment
8.1	To minimise the environmental impact from the construction works for the New Brewery Development.	Continue to comply with the requirements of Construction Environmental Management Plan for construction works Conduct environmental audits of construction contractors throughout construction works.	2016	Environmental Manager	Technical Support Team	Actions taken as appropriate throughout 2016.
8.2	To implement the programme of work outlined in the Decommissioning Management Plan for mothballing Brewhouse 3 and BBA.	The decommissioning plan and timelines for mothballing the existing Brewhouse and BBA are outlined in the DMP. Update the DMP to include new assets, as appropriate.	2016 - 2018	Engineering Manager	Engineering	In progress – likely that DMP will be revised in Q1 2017

3.2.2 Environmental and Energy Management Programme for 2017

In the following tables we set out our EEMP for 2017. This programme includes continuing the ongoing targets across the site and the introduction of new targets that were identified during 2016.

Objective 1.0	To protect soil, surface waters and groundwater from pollution.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Licence Reg. No. P0301-04.
Five Year Programme	As part of recent site redevelopment, significant new infrastructure, including process and surface water drainage systems in the Lower Level, were implemented. These systems are being incorporated into the maintenance plans for the site. Additionally, the site will continue to investigate the localised groundwater issue at MW8 and implement the agreed corrective actions.

No.	Target	Plan	Time scale	Responsibility	Department
1.1	Complete the corrective actions outlined in the 'Interim Report on Contamination Encountered in MW8 at St. James's Gate' dated 31st January 2013.	URS /AECOM to monitor the groundwater condition at MW8 and evaluate the impact of corrective actions taken on behalf of Diageo.	2017 - 2018	Environmental Manager	Lower Site
1.2	To protect soil, surface waters and groundwater from contamination from materials stored on the site.	Continue the drain relining capex project.	2017 - 2020	Engineering Manager/Environmental Manager	Overall Site
1.3	Implement the recommendations in the 2014 EPA Site Inspection report in relation the integrity of hard standing areas where raw materials are delivered	Use a risk based approach develop a hardstanding repair programme. Commence rolling integrity repair programme.	2017 2017 - 2020	Engineering Manager	Lower Site
1.4	Continue to monitor trend in ground water monitoring at MW13 to evaluate the integrity of the well. Zinc concentration remains elevated at MW13, groundwater monitoring results and observations made suggest that water quality at this location is being influenced by the mixing of groundwater with the brackish surface water in the River Liffey.	Continue to monitor the trend on groundwater sampling results.	2017	Environmental Manager	Lower Level

Objective 1.0	To protect soil, surface waters and groundwater from pollution.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Licence Reg. No. P0301-04.
Five Year Programme	As part of recent site redevelopment, significant new infrastructure, including process and surface water drainage systems in the Lower Level, were implemented. These systems are being incorporated into the maintenance plans for the site. Additionally, the site will continue to investigate the localised groundwater issue at MW8 and implement the agreed corrective actions.

No.	Target	Plan	Time scale	Responsibility	Department
1.5	Update the site drawings to incorporate the new development and site layout.	Site drawings were updated in 2016 – it is planned to keep a register of changes and drawings will be updated when new information becomes available (drawings updated after Keg Plant relining works completed)	2017	Engineering Manager	Overall Site
1.6	Inspection and repairs of concrete bunds	Review all bunded structures on the site to ensure that they are correctly classified. Put programme in place for implementation of recommendations to repair bunded structures.	2017	Engineering Manager	Overall Site
1.7	Maintain Underground tanks at the site.	Undertake integrity test on 'old' wet well associated with the WWNP. Repair underground tank at the Keg Plant.	2017 2017	Utilities & 3rd Party Contracts Manager Engineering Manager	

Objective 2.0	To improve control of air emissions from the site.
Rationale	Specific requirements relating to the control of air emissions are contained in Diageo Ireland IPPC Licence Reg. No. P0301-04.
Five Year Programme	To complete all outstanding actions from the test programmes for abatement systems as required under the Licence. Continue to manage and drive improvements for all emissions on site.

No.	Target	Plan	Time scale	Responsibility	Department
2.1	Provide data necessary to accurately calculate CO2 emissions from oxidation of TOC's in roaster afterburners	Carry out on and off gas monitoring of all roasters to demonstrate TOC load presented to the afterburners and the efficiency of the afterburners in oxidising the TOC across the process	2016	Contracts and Utility Manager	Engineering
2.2	Control of air emissions from new equipment on site	Introduce monitoring program for Roaster 4 and additional BH4 emission points post approval of the test program from the EPA.	2016	Environmental Manager	Technical support
2.3	To implement final phase of programme to remove all R22 gas air conditioning units from Dublin Brewery in line with legislation	Ensure any remaining R22 units are not maintained or serviced. Remove all remaining units on phased basis and replace with new units or decommission air conditioning units.	2017	Facilities	Overall site
2.4	To continue to monitor and reduce fugitive emissions on the site	To continue to report any fugitive emissions on site as part of the H&NM reporting system and to implement any repairs as required. To continue with the pipeline assessments to monitor for fugitive emissions and implement repairs where necessary To implement recommendations in the Fugitive emissions study for the site.	2016 - 2020	Environmental Manager	Overall site

Objective 3.0	To minimise waste on site.
Rationale	In line with Diageo Corporate Goals, St James's Gate strives to achieve zero waste to landfill. Specific requirements relating to the management of waste are also contained in Licence Reg. No. P0301-04.
Five Year Programme	Diageo at SJG has achieved a monthly target of zero waste to landfill on a regular basis throughout 2016. This remains the garget for 2017 and thereafter Diageo intends to sustain this performance.

No.	Target	Plan	Time scale	Responsibility	Department
3.1	Ensure that zero waste to landfill achieved each month for 2017	Continue to build awareness of the principles of Reduce, Reuse, and Recycle. Work with waste contract companies to ensure waste is routed away from landfill.	2017	Environmental Manager Facilities	Overall Site
3.2	To continue auditing waste contractors who remove waste material from the site.	Continue with the ongoing programme for the auditing of waste contractors.	2017	ISC Supplier Audit Co-ordinator (CR)	Overall Site
3.3	Ensure that waste materials are disposed of in accordance with waste hierarchy	Ensure that mixed dry recyclable materials are not sent off site as general waste. Reduce the quantity of waste generated from canteen/kitchen areas.	2017	Facilities Manager	Overall Site

Objective 4.0	To improve the management and control of effluent discharges from the site.
Rationale:	In line with good environmental practice and in response to our engagement process with DCC, Diageo Ireland is currently implementing a re-invigorated and targeted effluent reduction programme on site. Furthermore, specific requirements relating to control of effluent are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Historically, Diageo has delivered substantial reductions in effluent discharges from the site. The site recently underwent significant changes with Brew house 4 development and the transition of volume from SFAB and GNB, which includes brewing new products at SJG and increased volumes. Following the commissioning and optimisation of Brew house 4, Diageo will complete an assessment of effluent levels from the new operations and develop a register of opportunities to further decrease effluent. Diageo will continue to implement a committed programme to reduce effluent.

No.	Target	Plan	Time scale	Responsibility	Department
4.1	Diageo will engage with the Agency and DCC regarding the agreement of revised ELV limits at SE-1 prior to December 2017	Diageo to work closely with IW and DCC to provide all relevant information for the development impact assessment model for the area. If appropriate, and with the agreement of IW and DCC, Diageo will prepare a submission to the Agency for appropriate limits to be incorporated into the licence.	2017	Environmental Manager	Technical Support Team
4.2	Provide DCC/IW with data through batch file transfer at intervals to be determined and agreed with DCC/IW.	Continue to supply data as agreed in monthly meetings with DCC/IW	2017	Environmental Manager	Technical Support Team
4.3	Maximise surface water discharges through SW1, SW2 and SE3 and monitor the emissions accordingly.	Replace knife gate valve at SE-3 and ensure that appropriate protection measures are in place to engage closing of discharge point. Review trigger limit values and engage with DCC/IW and the EPA as appropriate.	2017	Environmental Manager	Technical Support Team
4.4	Diageo will continue to implement a committed programme to reduce effluent.	Develop work streams which are based on the identification and elimination of physical losses to drain in the production areas.	2017	Environmental Manager	Technical Support Team

Objective 5.0	To monitor the level of noise emissions on site, at the boundary of St James's Gate Site and at noise sensitive locations off site.
Rationale	In line with good environmental practice and in accordance with specific requirements relating to the noise emissions contained in Diageo Ireland Licence Reg. No. P0301-04 Diageo Ireland maintains a noise reduction programme on site.
Five Year Programme	Following the completion of the Brew house 4 development and the mothballing of existing process activities, Diageo will baseline the noise emissions at the boundary of the site. The noise reduction programme will be further developed and implemented accordingly.

No.	Target	Plan	Time scale	Responsibility	Department
5.1	To review the level of noise at noise sensitive locations.	Undertake noise measurements on the upper level to identify if additional control measures need to be put in place to reduce noise emissions from Roasthouse operations.	2017	Business Engineering	Roasthouse
5.2	Prepare a programme to reduce noise emissions including specific goals and a time scale, together with options for modification, upgrading or replacement.	Following the noise control engineering works, repeat the noise map that was developed to represent the noise profile on site and assess the impact that these noise sources now have on residential receptors.	2017	Business Engineering/Environmental Manager	Lower Level

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department
6.1	To baseline the chemical consumption levels of the new Brew house, BBA and Cold block and establish a continuous improvement plan for further improvements	• Plan to reuse any chemical/ingredient which remains in operational areas of decommissioned buildings on the upper level. • A baseline assessment of chemical usage to be undertaken across all production areas – this data will form a basis for identifying opportunities for improvements to be made. • Following completion of chemical review programme, update Continuous Improvement plan.	2017 2017 2017	Brewing Manager	Operations Technical Support Team
6.2	To baseline the water consumption levels of the new development and the existing operations and establish a continuous improvement programme	• Following the closure of all operations in legacy plants throughout 2016, review the register of opportunities to reduce water consumption and track the implementation of opportunities in accordance with the accredited ISO 50001 system.	2016 - 2017	Engineering Manager Contracts & Utilities Manager	Engineering

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department
6.3	To optimise the existing operations of the Kegplant to sustain BAT levels for chemical and water consumption levels.	• Implement the remaining recommendations in the KHS report to reduce chemical and water consumption. • Complete an up to date water balance of the keg plant and target the largest users on a Pareto basis. • Continue to use the tools of our ISO 50001 accredited energy management system to deliver sustained reductions in water consumption. Achieve a year-on-year reduction in water consumption per keg. • Develop a program to reduce the caustic usage in external washers. • Sustain the year on year increases in keg line OEE. • Maintain KRP waste levels at < 1.5%.	2016 - 2018	Packaging Production Manager	Keg Plant

Objective 6.0	To increase the efficiency of resource use on site.
Rationale	Specific requirements relating to the protection of groundwater and surface water are contained in Diageo Ireland Licence Reg. No. P0301-04.
Five Year Programme	Following the completion of Brew house 4, the BBA and the Cold block and the mothballing of existing process activities, Diageo will baseline the resource use for chemical and water consumption levels for new and existing operations. Diageo Ireland's current water efficiency is better than the BAT ratio of 3.5 l/l and a European average of 3.8l/l. Diageo intends to sustain this superior performance following the transition of volume and new products (ales and lagers) to site. In order to achieve this an ongoing continuous improvement strategy will be implemented in both new and existing areas.

No.	Target	Plan	Time scale	Responsibility	Department
6.4	Optimise the Water Treatment Plant and the abstraction from the Cooperage Well.	• Upgrade well water abstraction and treatment system to increase the volume of water available from this source during 2016 and beyond.	2016-2017	Contracts & Utilities Manager	Utilities Manager
		• Optimise performance of well water abstraction system to improve plant efficiency and reduce water rejected to drain.	2017	Contracts & Utilities Manager	Utilities Manager

Objective 7.0	To improve the energy efficiency of the Brewery site.
Rationale:	Diageo Ireland maintains an Energy Management System, which is accredited to ISO 50001. As part of this system, and in line with good environmental practice, Corporate Targets and the requirements of the Licence, Diageo operates a continuous improvement programme to maximise the energy efficiency of the site and to reduce the greenhouse gas emissions from the business.
Five Year Programme	Following the completion of the new development and the transition of volume from SFAB and GNB, Diageo will baseline the energy consumption of the site. Diageo will identify further opportunities to reduce energy consumption and implement accordingly. Currently the SJG Brewery is at the same or better than the best BAT efficiencies for our sector, as outlined in the European Commission reference document on Best Available Techniques (BAT) in the food, drink and milk industries. Following the optimisation of the new process equipment on site, the transitioning of additional volume on site and the mothballing of the existing operations, SJG intends to sustain the superior performance in energy efficiency and achieve BAT levels of performance.

No.	Target	Plan	Time scale	Responsibility	Department
7.1	Implement recommendations made in the Energy review report undertaken in 2016.	SJG will evaluate all of the opportunities identified in the audit report and implement where possible. SJG will develop a plan for implementation of the appropriate control measures.	2017 2017	Contracts and Utility Manager Contracts and Utility Manager	Engineering Utilities
7.2	Manage the energy consumption of the BBA operation to minimise energy consumption and monitor against vendor KPIs.	Review the energy consumption at the ESIM meeting. Expand the meeting to evaluate the impact or changes due to the new development.	2016	Engineering Manager	Engineering
7.3	Minimise process utility consumption on the upper level when BBA production is moved to the lower level.	Complete a full shutdown and isolation of compressed air, and refrigeration plants supplying GFE and BH3.	2016-2017	Contracts and Utility Manager	Engineering
7.4	Obtain a deeper understanding of energy consumption levels in the roast house.	Review the operation of each roaster production stream in conjunction with the ongoing roast quality project to identify the optimum energy consumption model that supports the production of roast material of the quality required to optimise the core production processes.	2017	Contracts & Utility Manager	Engineering

Objective 7.0	To improve the energy efficiency of the Brewery site.
Rationale:	Diageo Ireland maintains an Energy Management System, which is accredited to ISO 50001. As part of this system, and in line with good environmental practice, Corporate Targets and the requirements of the Licence, Diageo operates a continuous improvement programme to maximise the energy efficiency of the site and to reduce the greenhouse gas emissions from the business.
Five Year Programme	Following the completion of the new development and the transition of volume from SFAB and GNB, Diageo will baseline the energy consumption of the site. Diageo will identify further opportunities to reduce energy consumption and implement accordingly. Currently the SJG Brewery is at the same or better than the best BAT efficiencies for our sector, as outlined in the European Commission reference document on Best Available Techniques (BAT) in the food, drink and milk industries. Following the optimisation of the new process equipment on site, the transitioning of additional volume on site and the mothballing of the existing operations, SJG intends to sustain the superior performance in energy efficiency and achieve BAT levels of performance.

No.	Target	Plan	Time scale	Responsibility	Department
7.5	Incorporate the new operations and utility plants into the Energy Management System	Complete the documentation of the SOPs for the new process areas to ensure that the new processes are fully incorporated into the energy management system. Energy section to be added to the general SOP for Brewhouse and Cold Block.	2017	Contracts & Utility Manager	Engineering
7.6	Carryout complete review of individual energy consumer profiles and update site utilities model with revised targets based on current performance.	Using data collected since completion of plant and process upgrades develop a model for each production area and the sub processes that contribute to energy use in the area. Use the new model to monitor area efficiency and to target ongoing improvement in performance on an ongoing basis.	2017 to 2018	Contracts & Utility Manager	Engineering

Objective 8.0	To carry out development works at the site in accordance with environmental best practice and the principles of sustainable design and development. To mitigate any potential environmental liabilities from the site.
Rationale:	It is essential that all development works at the site are undertaken in the context of the site's licence and that the construction phase and operational phase of the development are planned to minimise the environmental impact, in line with the site's Environmental Policy.
Five Year Programme	The SJG site is currently undergoing a major redevelopment project. This work will be completed in a manner to minimise the impact of the environment.

No.	Target	Plan	Time scale	Responsibility	Department
8.1	To minimise the environmental impact from the construction works at St James Gate.	Implement appropriate environmental controls for all construction works Conduct environmental audits of construction contractors throughout construction works.	2017	Environmental Manager	Technical Support Team
8.2	To implement the programme of work outlined in the Decommissioning Management Plan for mothballing Brewhouse 3 and BBA.	The decommissioning plan and timelines for mothballing the existing Brewhouse and BBA are outlined in the DMP. Update the site ELRA & DMP to reflect current infrastructure at St James Gate.	2016 - 2018	Engineering Manager Environmental Manager	Engineering

4 LICENCE SPECIFIC REPORTS

4.1 Noise

In accordance with Condition 6.15 of the licence, Diageo carries out annual noise surveys at the eight noise sensitive locations around the site. The results from the most recent noise survey, carried out in October 2016, are summarised in Table 19.

Table 19: Summary of Noise Monitoring Results (LA_{eq})

Location	Day Time	Evening Time	Night Time
1 Ellis Quay	63	66	58
2 Bonham St. / Watling St.	59	58	52
3 Watling St.	62	58	53
4 School St. / Taylor's Lane	62	59	52
5 Marrowbone Lane	65	62	58
6 Bond St.	67	61	57
7 Echlin St.	60	59	52
8 Steeven's Gate	59	44	46

Note: The monitoring results presented in Table 19 are those measured at the noise sensitive locations, not the noise levels attributable to activities at the site. Compliance with the site's noise limits was assessed in the noise monitoring report, summarised below.

The noise survey report concluded the following regarding compliance with the site's licence:

- For measurement periods during the daytime, the dominant noise source in the majority of the noise sensitive locations was that of localised passing traffic and commuter / residential noise levels. Noise measurements on Watling Street and Bonham Street were influenced by audible noise levels from the operating plant. In areas where no specific plant noise was audible during measurement period, the plant noise levels are reported as being in compliance.
- For measurement periods during the evening time, the dominant noise source in the majority of the residential locations was that of passing traffic. Where no specific plant noise was audible during the measurement period, the plant noise levels are reported as being in compliance. Measurement data shows that the plant was in compliance at the all monitoring locations.
- For measurement periods during the night time, the dominant noise source in the majority of the residential locations was that of local residential noise and passing traffic. At locations where no specific plant noise was audible during the measurement period, the plant noise levels are reported as being in compliance.
- No tonal noise measurement values were noted during the measurement surveys at any locations.

Overall, the noise monitoring report noted that the plant is operating within compliance of its license limits at the majority of its noise sensitive monitoring locations. Measurements at Bonham Street, Watling Street and Marrowbone Lane indicated exceedance of the compliance limit values due to the broadband audible noise from the directions of the plant.

As with previous noise monitoring results, Diageo incorporates the findings into its noise management programme and this will continue, taking into account the completion of all development works at the site.

4.2 Testing and Inspection of Bunds, Underground Tanks and Pipelines

4.2.1 Overview

In accordance with Condition 6.11 of the licence, all bunds, interceptors, pipelines are inspected weekly and records are available for inspection on site. Similarly, in accordance with Condition 6.12, inspections of flanges and valves on over ground pipelines used to transport materials other than water for signs of leaks are completed weekly. The findings from the inspections are recorded, including any actions to be taken. In accordance with Condition 6.10, integrity testing is completed on all tanks and bunds every three years.

All records of the testing and inspection programme are maintained at the site.

4.2.2 Bunds

The current bund integrity testing regime commenced in 2011. As outlined to the Agency in July 2012, an accelerated programme of bund testing was implemented in 2012/ 2013 to ensure that all bunds had been tested. A detailed register of all bunds is maintained and the records are available for inspection. There are currently 366 active bunds at the site, with 64 fixed bunds and 302 mobile bunds.

Eighty active bunds were subject to testing or visual structural inspection in 2016. New bunds that were constructed or installed at the site during 2016 were either delivered with test certificates or were subject to integrity testing prior to entering service.

4.2.3 Underground Tanks

There are five underground storage tanks at the site, each for water storage. There are also two active level-controlled balancing tanks for effluent at the site. These structures are included in the integrity testing programme.

4.2.4 Pipe work inspections

Visual pipe work and drain inspections are carried out on a weekly basis. All findings are noted on 'walk drawings', with notifications raised on the SAP maintenance system for action. Table 20 provides a summary of the inspections during 2016.

Table 20: Pipe Walk Notification Summary

Description	Count
Total inspection notifications raised:	8
IEL related notifications	-
IEL notifications outstanding (not including those in progress):	-

4.2.5 Interceptor Inspections and Work

Inspections of the interceptors across the site are completed on a weekly basis. In addition to the weekly inspections, the interceptors undergo quarterly sample analysis to measure oil content and are regularly cleaned. This occurs on a scheduled basis with the interceptors skimmed annually, while the units are cleaned every two years. Interceptors were either skimmed or cleaned entirely in 2016.

Table 21: Summary of Site Interceptors

Tag Number	Locations
SJG-ICT-001	Near RB Plant
SJG-ICT-002	Near RB Plant
SJG-ICT-003	Gate 6
SJG-ICT-004	Gate 6
SJG-ICT-005	Gate 6
SJG-ICT-007	Gate Power
SJG-ICT-008	Gate Power (ESB sub Station)
SJG-ICT-009	BH4 grain intake
SJG-ICT-010	Waste Water Treatment Plant
SJG-ICT-011	Gate 6 Access Point

4.2.6 Drains

Diageo has continued to investigate the integrity of drains across the site. As outlined in the EEMP, Diageo commenced an accelerated programme for testing of process drains. In 2013, Diageo focused primarily on the drainage networks on the Lower Level. In 2013, the significant redevelopment of the Lower Level was completed as part of the construction of Brewhouse 4. Diageo upgraded the drainage network in the developed areas of the site and installed new stainless steel drains for process effluent, in line with good practice. All new drainage networks constructed were integrity tested and certified. Refer also to Section 4.2.4.

Diageo completed a comprehensive relining project of underground drains, aco channels and catch pits in 2016 in the fermentation area of the site. A similar programme commenced on the keg plant drainage network in 2016 and is due for completion in 2017.

4.3 Groundwater

4.3.1 Overview

In accordance with Condition 10.3.3 of the original licence (P0301-01), a hydrogeological investigation was carried out at the site in three phases between 2002 and 2008. Following completion of Phase 2 of the investigation, the hydrogeologist recommended that a programme of Monitored Natural Attenuation be implemented at the site in combination with an ongoing monitoring programme.

The monitoring programme commenced in Phase 3 of the investigation, and the results over a two year period were analysed. The analysis indicated that the groundwater quality at the site was improving with regard to general suite parameters, heavy metals (except chromium), diesel range organics, mineral oil and PAH (except naphthalene), although the results of consecutive monitoring rounds show both increases and decreases in the concentrations of individual parameters.

The groundwater monitoring programme has continued since completion of the hydrogeological investigation and in accordance with the requirements of the current licence (P0301-04). During 2016, two rounds of monitoring were carried out: one round in June 2016 (refer to Section4.3.2) and one round in October 2016 (refer to Section 4.3.3). A summary of the results is provided in Annex 2, showing the comparison against the relevant groundwater quality indicators, the EPA's Interim Guideline Values (IGV) or the Groundwater Threshold Values (GTV), where appropriate.

A review of the groundwater data indicates that there are no sustained elevated concentrations of organic contaminants (hydrocarbons or polycyclic aromatic hydrocarbons). Elevated concentrations of some major ions (potassium, sodium, magnesium, sulphate and chloride) are considered to be related to the site's location adjacent to the River Liffey Estuary Upper with mixing of groundwater and surface water occurring, resulting in higher concentrations of some major ions. Other major ion and metal concentrations are considered to be largely related to the geology beneath the site.

The full groundwater monitoring reports are available for inspection by the Agency.

4.3.2 Round 1 2016

The first round of groundwater monitoring for 2016 was carried out in June 2016.

The results from the groundwater monitoring indicate that there are no sustained elevated concentrations of organic contaminants (hydrocarbons or PAH), and that elevated concentrations of some major ions (potassium, sodium, magnesium, sulphate and chloride) are related to the site's location adjacent to the River Liffey Estuary Upper, with mixing of groundwater and brackish surface water resulting in higher concentrations.

Other major ion and metal concentrations are largely related to the geology beneath the site or potentially related to offsite sources – elevated concentrations of major ions were detected at MW14a, similar to the results from previous monitoring rounds. However, nitrate concentrations measured in samples from the River Camac indicate that the river is not a contributory factor to the elevated nitrates in MW14a.

Groundwater in vicinity of MW8 and MW8a displays anomalously high groundwater elevations and elevated pH, electrical conductivity, temperature, sodium, ammoniacal nitrogen, alkalinity, aluminium and arsenic concentrations, again consistent with the results from previous monitoring rounds. Water level measurements and field water quality readings recorded over a number of days also show variability over short time periods.

4.3.3 Round 2 2016

The second round of groundwater monitoring for 2016 was carried out in October 2016.

As in the case of the results from the first round in 2016, and in previous years, the groundwater data indicates that there are no sustained elevated concentrations of organic contaminants (hydrocarbons or PAH). Again, elevated concentrations of some major ions are considered to be related to the site's location adjacent to the River Liffey Estuary Upper, with mixing of groundwater and brackish surface water resulting in higher concentrations in groundwater close to the river.

Elevated concentrations of major ions were detected in groundwater from MW14a, similar to those from the June monitoring round.

Diageo is continuing to investigate the underlying cause of the anomalous readings at both MW14a and MW8 / MW8a and will continue its groundwater monitoring programme in 2017.

4.4 Efficiency of Use of Raw Materials

The efficiency of the use of raw materials in processes and the reduction in process waste was assessed as a part of the energy efficiency audit (refer to Section 2.3.1). The quantity of input raw materials and the quantities of production wastes are recorded and tracked against relevant metrics and targets. In addition, the quantity of by-products of production (notified to the Agency in 2012) is recorded and tracked.

4.5 Minimisation of Water Demand

Water consumption reduction initiatives at the site are driven as part of the ISO 50001 Energy Management System. Diageo has an aggressive water reduction programme that has demonstrated significant success over recent years and has led to a significant reduction in specific water consumption. Reductions in water consumption also result in a reduction the process effluent, which is fundamental to the site's effluent reduction plan.

Further opportunities for reductions in water consumption are captured on the Register of Opportunities and are implemented on a systematic basis. Diageo is also continuing to engage with Irish Water and Dublin City Council in relation to reductions in the volume of process effluent discharged from the site.

4.6 Decommissioning Management Plan

Diageo submitted a copy of the decommissioning management plan to the EPA in March 2013, and this plan was approved. In February 2015, the plan was reviewed and updated in accordance with the EPA's *Guidance on assessing and costing environmental liabilities* (2014). The Plan is reviewed on an annual basis and updates to the plan or the associated closure costs are advised to the EPA accordingly.

4.7 Environmental Liability Risk Assessment

In March 2013, Diageo submitted a copy of the Environmental Liability Risk Assessment (ELRA) to the EPA. The EPA approved the technical elements of the ELRA, following which Diageo submitted its proposal for Financial Provisions in May 2013. The EPA requested additional information on Diageo's proposal in September 2013 and Diageo provided the clarifications in October 2013. Diageo and the EPA met in March 2014 to progress agreement on the Financial Provisions. During 2014, the ELRA was revised and updated to reflect the development of Brewhouse 4 and associated areas on the Lower Level of the site.

The most recent revision and update of the ELRA was completed in February 2015 and was carried out in accordance with the EPA's *Guidance on assessing and costing environmental liabilities* (March 2014).

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ANNEX 1: AER RETURNS WORKBOOK AND EUROPEAN POLLUTANT RELEASE AND TRANSFER REGISTER

Environmental Protection Agency

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2016

1. FACILITY IDENTIFICATION

Parent Company Name	Diageo Ireland
Facility Name	Diageo Ireland (St. James Gate)
PRTR Identification Number	P0301
Licence Number	P0301-04

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	St. James's Gate
Address 2	Dublin 8
Address 3	
Address 4	
	Dublin
Country	Ireland
Coordinates of Location	-6.28683 53.3427
River Basin District	IEEA
NACE Code	1105
Main Economic Activity	Manufacture of beer
AER Returns Contact Name	Timmy Quillinan
AER Returns Contact Email Address	timmy.quillinan@diageo.com
AER Returns Contact Position	SJG Environmental Manager
AER Returns Contact Telephone Number	+353 (0) 1 4714681
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	140
User Feedback/Comments	Variations in emission quantities compared to the previous year are attributable to changes in production volumes, operations and monitoring results.
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
8(b)(ii)	Vegetable raw materials
1(c)	Thermal power stations and other combustion installations

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	No
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

Guidance on waste imported/accepted onto site

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	No

This question is only applicable if you are an IPPC or Quarry site

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs											
POLLUTANT		METHOD												QUANTITY		
			Method Used		A1-3	A1-4	A1-5	A1-6	A1-7	A2-1	A2-2	A2-6	Brewing, logistics & small users			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	Emission Point 4	Emission Point 5	Emission Point 6	Emission Point 7	Emission Point 8	Emission Point 9	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
06	Ammonia (NH3)	E	ESTIMATE	Estimated based on quantities added to refrigeration system. Brewing and fugitive emission calculated from production figures.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03	Carbon dioxide (CO2)	C	ETS		17859979.4	13773540.0	11859071.1	5953531.3	117555.1	1395719.2	1395719.2	664628.2	5345318.7	59823796.6	0.0	1458734.4
02	Carbon monoxide (CO)	M	EN 15058:2004		1205.0	422.0	734.0	10390.0	0.2	24454.0	31919.0	7145.3	0.0	76269.5	0.0	0.0
14	Hydrochlorofluorocarbons (HCFCs)	E	ESTIMATE	Estimated based on quantities added to refrigeration system.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
04	Hydro-fluorocarbons (HFCs)	E	ESTIMATE	Estimated based on quantities added to refrigeration system.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	M	EN 14792:2005		13439.0	12300.2	18318.8	7082.0	61.0	1535.5	1398.7	597.9	0.0	54733.1	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs											
POLLUTANT		METHOD												QUANTITY		
			Method Used		A2-1	A2-2	A2-3	A2-4	A2-5	A2-6	A2-7	A2-8	A2-9, A2-10, A2-11, A2-12, A2-13, A2-14 & A2-17			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	Emission Point 3	Emission Point 4	Emission Point 5	Emission Point 6	Emission Point 7	Emission Point 8	Emission Point 9	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
351	Total Organic Carbon (as C)	M	OTH	BS EN 12619:2013	1019.8	1230.0	0.0	0.0	0.0	1515.7	0.0	0.0	0.0	3765.5	0.0	0.0
244	**Total Particulates**	M	OTH	EN 13284-1	0.0	0.0	1.0	0.9	0.9	0.0	80.9	43.4	725.0	852.1	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Diageo Ireland (St. James Gate)

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used: Method Code**	**Method Used: Designation or Description**	**Facility Total Capacity m3 per hour**	
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

4.2 RELEASES TO WATERS

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this onl

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used		SE-1			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
79	Chlorides (as Cl)	M	OTH	UKAS accredited laboratory method (TM 097D based on USEPA Method 525.1/2)	320105.6	320105.6	0.0	0.0
20	Copper and compounds (as Cu)	M	OTH	UKAS accredited laboratory method (TM 152D by ICPMS)	45.7	45.7	0.0	0.0
12	Total nitrogen	M	OTH	UKAS accredited laboratory method (TM 102D based on AWWA/APHA 20th Edition - Method 4500)	66010.2	66010.2	0.0	0.0
76	Total organic carbon (TOC) (as total C or COD/3)	M	OTH	UKAS accredited laboratory method (TM 107D using Dr Lange Kit)	2456017.7	2456017.7	0.0	0.0
13	Total phosphorus	M	OTH	UKAS accredited laboratory method (TM 152D by ICPMS)	34565.2	34565.2	0.0	0.0
24	Zinc and compounds (as Zn)	M	OTH	UKAS accredited laboratory method (TM 152D by ICPMS)	230.2	230.2	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used		SE-1			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
303	BOD	M	OTH	UKAS accredited laboratory method (TM 045D based on MEWAM BOD5 2nd Edition 1988/AWWA/ APHA 20th Edition - Method 5210B)	4738322.1	4738322.1	0.0	0.0
306	COD	M	OTH	UKAS accredited laboraotry method (TM 107D using Dr Lange Kit)	7368053.2	7368053.2	0.0	0.0
308	Detergents (as MBAS)	M	OTH	Laboratory method	832.1	832.1	0.0	0.0
314	**Fats, Oils and Greases**	M	OTH	Laboratory method	100634.7	100634.7	0.0	0.0
343	Sulphate	M	OTH	UKAS accredited laboratory method (TM 098D by Kone Analyser)	152984.7	152984.7	0.0	0.0
240	Suspended Solids	M	OTH	UKAS accredited laboratory method (TM 022D by Gravimetric Determination based on BS 2690:Part 120:1981)	1296833.3	1296833.3	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.4 RELEASES TO LAND

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			QUANTITY		
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			QUANTITY		
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Please enter all quantities on this sheet in Tonnes

0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
To Other Countries	15 01 10	Yes	0.66	Empty ink cartridges	D10	M	Weighed	Abroad	Indaver Ireland Limited,W0036-02	Tolka Quay Road,Dublin Port,Dublin 1,.,Ireland	Abfall Verwertungs Gesellschaft Gmb,11/05/2005 IB2234/AVG-GENB-2,Borigstrasse 2,D-22113 Hamburg,.,.,Germany	Borigstrasse 2,D-22113 Hamburg,.,.,Germany
To Other Countries	16 05 06	Yes	2.044	laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals	R1	M	Weighed	Abroad	Enva Ireland Limited (Shannon),W0041-01	Smithstown Industrial Estate,Shannon,Co. Clare,.,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
To Other Countries	16 03 03	Yes	6.0	Waste hydrochloric acid	R1	M	Weighed	Abroad	Enva Ireland Limited (Shannon),W0041-01	Smithstown Industrial Estate,Shannon,Co. Clare,.,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
Within the Country	13 05 08	Yes	25.44	Waste from interceptors	R9	M	Weighed	Offsite in Ireland	Enva Ireland,W0196-01	JFK Industrial Estate,Naas Road,Dublin 12,.,Ireland	Enva Ireland,W0184-01,Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland
Within the Country	11 01 13	Yes	0.085	degreasing wastes containing dangerous substances	R13	M	Weighed	Offsite in Ireland	Safety Kleen Ireland Ltd.,W0099-01	Unit 5,Airton Road,Tallaght,Dublin 24,Ireland	Safety Kleen Ireland Ltd.,W0099-01,Unit 5,Airton Road,Tallaght,Dublin 24,Ireland	Unit 5,Airton Road,Tallaght,Dublin 24,Ireland
To Other Countries	16 05 06	Yes	1.0	Waste flammable liquid, methanol and phosphoric acid	R1	M	Weighed	Abroad	Enva Ireland Limited (Shannon),W0041-01	Smithstown Industrial Estate,Shannon,Co. Clare,.,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
Within the Country	11 01 14	No	0.18	degreasing wastes other than those mentioned in 11 01 13	R13	M	Weighed	Offsite in Ireland	Safety Kleen Ireland Ltd.,W0099-01	Unit 5,Airton Road,Tallaght,Dublin 24,Ireland		
To Other Countries	16 05 08	Yes	1.0	discarded organic chemicals consisting of or containing dangerous substances	R1	M	Weighed	Abroad	Enva Ireland Limited (Shannon),W0041-01	Smithstown Industrial Estate,Shannon,Co. Clare,.,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
To Other Countries	15 02 02	Yes	15.0	Filters	R1	M	Weighed	Abroad	Enva Ireland Limited (Shannon),W0041-01	Smithstown Industrial Estate,Shannon,Co. Clare,.,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
Within the Country	19 09 02	No	8.08	sludges from water clarification	R13	M	Weighed	Offsite in Ireland	Enva Ireland,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland		
To Other Countries	08 01 11	Yes	0.2	Empty unclean packaging, paint related material	R1	M	Weighed	Abroad	Enva Ireland,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
To Other Countries	15 02 02	Yes	0.93	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	R1	M	Weighed	Abroad	Enva Ireland,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany

To Other Countries	15 01 10	Yes	0.695	packaging containing residues of or contaminated by dangerous substances	R1	M	Weighed	Abroad	Enva Ireland,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland	Lindenschmidt Umweltservice,EFB No. 04 714 98089,Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany	Krombacher Strasse 42-46,Kreutzal D-57223,.,.,Germany
Within the Country	13 02 08	Yes	3.8	other engine, gear and lubricating oils	R9	M	Weighed	Offsite in Ireland	Enva Ireland,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland	Enva Ireland,W0184-01,Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland	Clonminam Industrial Estate,Portlaoise,Co. Laois,?,Ireland
Within the Country	20 01 01	No	17.395	paper	R3	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Ltd.,WFP-DC-11-0023	Unit 6 S3B Heanry Road,Park West Business Park,Dublin 12,Co. Dublin,Ireland		
Within the Country	15 01 01	No	37.395	cardboard	R3	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Ltd.,WFP-DC-10-0021-02	Unit 51 Henry Road,Park West Business Park,Dublin 12,Co. Dublin,Ireland		
Within the Country	19 12 02	No	43.317	ferrous metal	R4	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
Within the Country	17 02 01	No	51.77	wood	R3	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
Within the Country	20 03 01	No	44.163	dry mixed recyclables	R3	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Ltd.,WFP-DC-10-0021-02	Unit 51 Henry Road,Park West Business Park,Dublin 12,Co. Dublin,Ireland		
Within the Country	20 01 08	No	170.332	Organic compost	R3	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
Within the Country	20 03 01	No	197.44	mixed municipal waste	R1	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
Within the Country	17 09 04	No	1370.62	C&D waste	R5	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
To Other Countries	17 05 03	Yes	17.74	Cat D Soil	R5	M	Weighed	Abroad	Rilta Environmental Limited,W0192-03	Block 402 Grants Drive,Greenogue Business Park,Rathcoole,Co. Kildare,Ireland	TerraCon Gmbh,eg0102,Hovestr.,74 - 76,Hamburg,20539,Germany	Hovestr.,74 - 76,Hamburg,20539,Germany
Within the Country	17 05 04	No	8.08	Sand	R5	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
Within the Country	02 07 04	No	17.74	spent activated carbon	R13	M	Weighed	Offsite in Ireland	Padraig Thornton Waste Disposal Limited,W0044-02	Thorntons Recycling Centre,Killeen Road,Ballyfermot,Dublin 10,Ireland		
Within the Country	15 01 10	Yes	4.63	packaging containing residues of or contaminated by dangerous substances	R13	M	Weighed	Offsite in Ireland	SRCL,W054-02	Unit 1A,Allied Industrial Estate,Kylemore Road,Dublin 12,Ireland	SRCL,W054-02,Unit 1A,Allied Industrial Estate,Kylemore Road,Dublin 12,Ireland	Unit 1A,Allied Industrial Estate,Kylemore Road,Dublin 12,Ireland

* Select a row by double-clicking the Description of Waste then click the delete button

ANNEX 2: SUMMARY OF GROUNDWATER MONITORING RESULTS

Parameter	Units	GTV	IGV	MW1			MW1A			MW2			MW3		
				Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16
Arsenic	µg/l	7.5	10	16	15	19.6	9	6	15.3	-	8	2.6	43	38	38.7
Cadmium	µg/l	3.75	5	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	µg/l	37.5	30	-	-	-	-	-	-	-	-	-	-	2.3	-
Copper	µg/l	1,500	30	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/l	18.75	10	8	-	-	-	-	-	-	-	-	16	-	-
Nickel	µg/l	15	-	4	3	4	5	5	5	4	3	3	-	-	-
Zinc	µg/l	-	100	3	3	-	6	8	10	-	-	4	-	-	-
Calcium	mg/l	-	200	154	129	221	280	189	127	131	124	95	79	82	117
Sodium	mg/l	150	150	57	42	48	144	134	148	85	92	86	651	767	733
Potassium	mg/l	-	5	19	14	18	8	8	9	23	23	23	55	56	65
Nitrate	mg/l	8.5	5.6	0.1	0.11	0.21	0.1	-	-	0.11	0.12	0.06	2.05	3.63	2.46
Nitrite	mg/l	0.11	0.03	-	0.017	-	-	-	-	-	-	-	0.252	0.102	0.148
Ammoniacal Nitrogen	mg/l	0.065-0.175	0.12	1.7	1.1	1.23	1.8	1.8	1.83	2.1	4.3	4.18	0.4	0.16	0.34

Parameter	Units	GTV	IGV	MW5A			MW6			MW6A			MW8		
				Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16
Arsenic	µg/l	7.5	10	-	-	-	-	3	-	-	-	-	15	23	54.3
Cadmium	µg/l	3.75	5	0.6	-	-	1.4	-	0.9	1.1	-	-	-	-	-
Chromium	µg/l	37.5	30	-	-	-	-	-	-	-	-	-	-	-	-
Copper	µg/l	1,500	30	-	-	-	-	-	-	-	-	-	-	-	-
Lead	µg/l	18.75	10	-	-	-	-	-	-	-	-	-	25	-	-
Nickel	µg/l	15	-	3	4	3	7	2	8	4	5	4	5	3	10
Zinc	µg/l	-	100	3	4	-	20	10	13	5	7	6	9	7	52
Calcium	mg/l	-	200	107	119	238	178	106	154	176	175	2	20	3	2
Sodium	mg/l	150	150	114	136	150	251	114	391	1639	1697	1435	1545	749	1565
Potassium	mg/l	-	5	16	15	18	16	11	21	54	53	42	12	10	17
Nitrate	mg/l	8.5	5.6	0.11	-	-	0.72	0.19	0.12	0.17	0.1	0.05	0.17	1	0.31
Nitrite	mg/l	0.11	0.03	-	-	-	-	-	-	-	-	-	-	0.303	0.006
Ammoniacal Nitrogen	mg/l	0.065-0.175	0.12	0.04	0.05	0.04	0.43	0.19	1.3	0.3	0.3	0.19	5.8	1	14.11

Parameter	Units	GTV	IGV	MW8A			MW13			MW14A			MW21		
				Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16	Oct-15	Jun-16	Oct-16
Arsenic	µg/l	7.5	10	22	18	52.7	-	-	2.6	-	-	-	-	-	2.7
Cadmium	µg/l	3.75	5	-	-	-	0.8	-	-	-	-	-	0.6	-	-
Chromium	µg/l	37.5	30	-	-	-	-	1.5	-	1.7	1.5	2	-	-	-
Copper	µg/l	1,500	30	24	-	43	-	-	-	-	-	-	-	-	-
Lead	µg/l	18.75	10	69	-	64	8	-	-	7	-	-	-	-	-
Nickel	µg/l	15	-	5	3	10	37	42	41	-	-	-	6	4	7
Zinc	µg/l	-	100	14	-	32	2878	2785	3204	6	-	4	-	-	-
Calcium	mg/l	-	200	2	2	85	190	195	153	132	126	307	357	146	127
Sodium	mg/l	150	150	1882	861	1529	298	383	402	72	68	77	1210	326	1832
Potassium	mg/l	-	5	15	10	17	28	26	37	18	17	21	40	16	57
Nitrate	mg/l	8.5	5.6	1.13	0.1	-	0.31	-	0.55	36.9	36.3	44.28	0.07	-	0.05
Nitrite	mg/l	0.11	0.03	0.194	0.204	-	0.062	-	-	0.047	0.109	0.021	-	-	-
Ammoniacal Nitrogen	mg/l	0.065-0.175	0.12	8.1	1.1	13.34	1.5	1.6	1.44	0.05	0.05	0.05	2	1	1.9