Annual Environmental Report 2009

IPPC Licence Register Number	P0443-02
Licensee:	Bulmers Limited
Location of installation	Annerville, Clonmel, Co. Tipperary.

C & C Group

Bulmers Ltd. and Grants of Ireland Ltd.

IPPC Licence Register Number PO443-02

Annual Environment Report 2009

Preface

C&C Group PLC. were granted the Integrated Pollution Prevention and Control Licence, Register Number PO443 - 02, by the Environmental Protection Agency on 1st November 2006, to conduct Commercial Brewing at Annerville, Clonmel, Co. Tipperary.

Site Development necessitated review of the Company's IPC Licence, in accordance with Condition 1.2 of the Licence. Parallel development of the Wastewater Treatment Plant was also completed.

Emissions to Sewer Limits were revised by the Environmental Protection Agency, subject to defined conditions, on 28 November 2006.

Schedule 5 (i) requires C & C group prepares an Annual Environmental Report for submission to the Environmental Protection Agency (EPA) .

This report details the environmental performance at the site for the period January to December 2009 and had been prepared in accordance with the Guidance Note for Annual Environmental Reports, published in October 2000.

Environmental Improvements implemented during 2009 include:

- Further reduction in Waste to Landfill,
- Increased Recycling on site,
- Installation of a chemical usage monitoring system.
- Energy efficiency improvements
- Complete carbon footprint completed for 2009.
- Spring water Certification for wellfield Aquifer
- IS393 accreditation
- Commissioning of new well in Redmonstown.
- Sustainablity framework Document completion
- Recognised for environmental improvements on site at European Supply Chain Awards 2009.

Bulmers Ltd. and CCI.

IPPC Licence Register Number PO443-02

Annual Environment Report

Table of Contents

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Section 1.1

Company Name, Location and IPPC Licence Number

Company Name: C & C Group plc.
Location of Activity: Annerville, Clonmel, Co. Tipperary.
IPPC Licence Register Number: PO443 -2

Section 1.2

Description of Site Activities

C&C Group Ltd. was granted the Integrated Pollution Control Licence, Register Number PO443-2 by the Environmental Protection Agency on 1st November 2006.

The Licence authorises the Company to conduct Commercial Brewing at Annerville, Clonmel, Co. Tipperary.

The main unit operations conducted by C&C Group at the Annerville Site are as follows: -

- Seasonal Apple Crushing
- Concentrate Fermentation
- Juice Storage
- Product Blending
- Canning
- Kegging
- Bottling
- Storage of Finished Product
- Distribution

A separate IPC Licence (Register Number 444) was granted for the Company's Facility located at Dowd's Lane, Clonmel, Co. Tipperary.

The Company's Product Range includes Bulmers Original Cider, Magners Original Cider, Pear cider, Ritz and Stag.

The CCI Facility, also located at Annerville, conducts the following operations: -

- Product Blending
- Bottling
- Storage

The CCI Product Portfolio includes Carolans Cream Liqueur, Irish Mist and Tullamore Dew.

Environmental Policy

C&C Group produce and deliver alcoholic beverages for the national and international consumer markets. This Environmental Policy applies to the both the Dowds lane and Annerville sites.

The Company is committed to prevention of pollution, compliance with applicable environmental legislation and to continuous improvement to meet defined standards of environmental performance.

Suppliers and Contractors are encouraged to adopt a similar approach.
This policy, and relevant environmental information, is communicated to all persons working for or on behalf of the organisation, and is available to the public.
In recognition of its Environmental Impact, the Company has established a framework for setting and reviewing Environmental objectives and targets.

Key elements of the framework are as follows;

Wastewater Treatment
C&C Group operate to an IPPC licence. The company's wastewater treatment plant ensures treated wastewater meets the criteria outlined in the IPPC licence.

Water Use Reduction
Water is sourced and used responsibly. Water conservation is a key company objective.

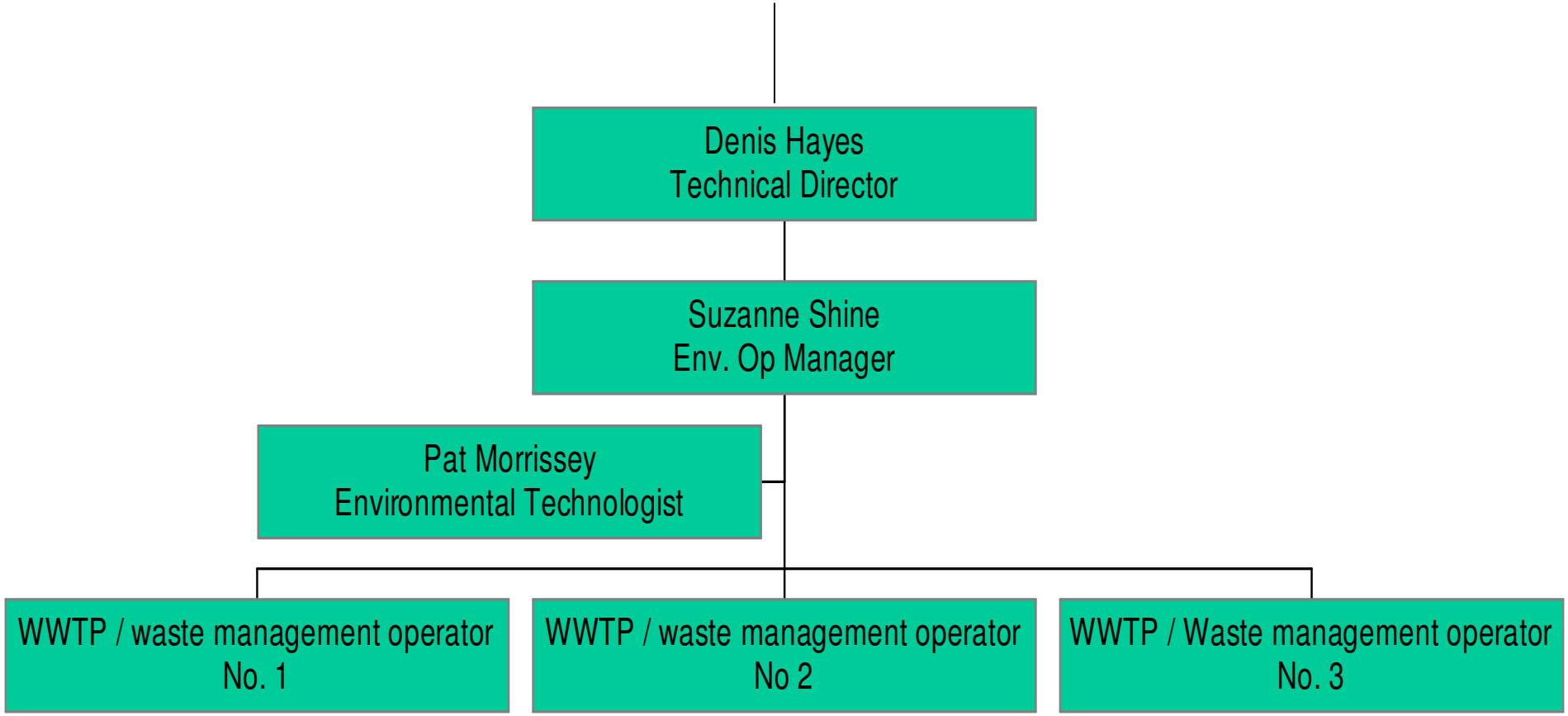
Solid Waste Reduction
The companie's strategy for waste management is to prevent, minimise, reuse and recycle. All wastes, are handled and disposed of in accordance with legislation and best prevailing industry practice.

Energy Reduction
The company is committed to energy reduction. Energy awareness programmes are conducted on an annual basis.

Air Emissions
Emissions to the air of gas (including greenhouse gases), odours, vapors and noise are monitored in accordance with conditions of IPPC license. The environmental impact of company owned or subcontracted transport is monitored and minimised.

Section 1.4

Environmental Management – Organisation Chart



AER Summary Table Section 2.1

Summary Of Emissions

Company		C & C group plc.
Address		Annerville, Clonmel, Co. Tipperary
Contact Name		Suzanne Shine
Telephone		052 6172294
E-mail		suzanne Shine@candcgroup.ie
GPS Co-ordinates(4N,4E)		0738N, 5223E
IPC Register Number		443
IPC Class		7.00
IPPC Class		
NOSE-P Code		105.03
NACE CODES	Section	D
	Sub-Section	A
	Division	15
	Group	15.9
	Class	15.94

Process Emissions to Waters

If Emissions to Waters do not apply to your license, please tick here

Indicate Yes if emissions are to:	**Freshwater**	**or Sewer**		
	No	Yes		
Parameter	**Unit**	**Max. Licensed Emission per year**	**2009**	**2008**
Volume	M^3/yr	472770	255801	338931.5
Suspended Solids	Kg/yr	213000	4150	9553
BOD	Kg/yr	416864	4798	12003.3
Ammonia	Kg/yr	4728	173.37	N/A
Orthophosphate	Kg/yr	1182	287	N/A
Oils Fats and Greases	Kg/yr	118193	2745.59	N/A
Total Heavy Metals	Kg/yr	473	19	N/A
Detergents	mg/l	50	0.25	N/A
Sulphates	mg/l	400	20	N/A

Emissions to air

If Emissions to Air do not apply to your license, please tick here

Parameter	**Unit**	**Max. Licensed Emission per year**	**2009**	**2008**
Co2	Kg/yr	Limit not Defined	9790	10758

Boiler Emissions to air

If Boiler Emissions do not apply to your license, please tick here

Parameter	**Unit**	**Max. Licensed Emission per year**	**2009**	**2008**
Nox	Kg/yr		150.16	170
CO2	Kg/yr		8.62	8.76
CO	Kg/yr		0	0.33

Energy Usage

Energy Consumption	**Sulphur Content**	**Unit**	**2009**	**2008**
Natural Gas		KWHR	19,447,346	21,494,177
Electricity		KWHR	12,705,069	15,197,060
LPG		KWHR	2,570,523	1,650,473

Environmental Complaints

		2009	**2008**
	Complaints received	0	0
	Complaints requiring corrective ac	0	0

Categories of complaint

		2009	**2008**
	Odour	0	0
	Noise	0	0
	Water	0	0
	Air	0	0
	Procedural	0	0
	Miscellaneous	0	0

Water	Unit		2009	2008
On-site groundwater use	m^3/yr		474,124	511,904
On-site surface water use	m^3/yr		0	0
Municipal water use	m^3/yr		18620	27466

Accreditation

EMAS (Yes/No)	No
ISO 14000 Series (Yes/No)	yes
IS393 certifcation	yes
IS432 certification	yes

IPPC Licence Register No. 443. Section 2.2

Boiler Combustion Efficiency
Emission Point Reference Numbers: A3-1, A3-2 A3- 3

Table 2.2 Combustion Efficiency Summary

	2008								
	Low Fire Efficency %			Med. Fire Efficency %			High Fire Efficency %		
	Boiler 1			Boiler 2			Boiler 3		
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Boiler 1	89.1	89.2	89.2	89.8	89.7	89.7	88.1	89.6	90.5
Boiler 2	90.7	91.2	90.4	91.6	91.9	91.7	90.1	88.8	88.7
Boiler 3	95	94.4	93.9				92.9	92.2	92.2
Year	**2009**								
Date	**04/06/2009**								
	Low Fire Efficency %			**Med. Fire Efficency %**			**High Fire Efficency %**		
	Boiler 1			Boiler 2			Boiler 3		
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Boiler 1	90.3	90.3	90.7	90.4	90.1	90.3	89.7	89.6	90
Boiler 2	90.7	89.6	89.9	90.7	90.9	90.2	89	89.3	89
Boiler 3	93.1	91.9	91.4	91.3	90.9	90.7	90.8	90.3	90.2

	Boiler 1			**Boiler 2**			**Boiler 3**		
Date	**04/06/2009**			**04/06/2009**			**04/06/2009**		
	Low Fire	Mid Fire	High Fire	Low Fire	Mid Fire	High Fire	Low Fire	Mid Fire	High Fire
O_2	7.58	5.53	3.69	7.92	5.5	3.72	7.2	5.69	4.41
CO	0	0.33	2	0.33	0	0	8.33	0	0
NOX	148.66	170	777.33	160	168.66	176.66	120	134	138.6
SO_2	0	0	0	0	2	2.66	33.33	1	1.66
CO_2	7.6	8.76	9.81	7.41	8.78	9.79	7.81	8.67	9.39

IPPC Licence Register Number 443

Section 2.3

Carbon Dioxide Emissions to Atmosphere Summary

Area/ Process		2008	2009
		Tonnes	Tonnes
Fermentation [1]	(Tonnes per Year)	9919	3472
Process Loss [2]	(Tonnes per year)	839	764
Cumulative	(Tonnes per Year)	10758	4236

The Method of Calculation of CO_2 Emissions is outlined in the Pollution Emission Register Report (Section 3.5)

Note:

[1] CO_2 is a by product of fermentation

[2] CO_2 is utilised as a process aid, for Tank Pressurizing, Product Filling, Fermentation Control

IPPC Licence Register Number 443

Section 2.4
Emissions to Sewer Summary Table
Emission Reference Point:

	Actual Emissions	Licensed Emissions	Actual Emissions	Licensed Emissions	Actual Emissions	Licensed Emissions	Actual Emissions	L E
	2006	2006	2007	2007	2008	2008	2009	
Volume (m^3)	333728	472770	346951	682550	338932	341641.1	255801	3
Temperature	21.72	40	21.481	40	20.65	40.0	21.13	
pH	7.96	3 - 10	8.132	3 - 10	8	8.2	8.01	
BOD (Kg / daily)	110776	416864	127128.100	623420	12003.3	12059.96	0	
Settleable Solids	20745	213000	20102.000	365000	9553	9153.8	4150	
Sulphates (as SO_4)	1762	189108	2914.388	189108	359	189108	5187	
Detergents (as MBAS)	50	23639	17.348	23639		23639	65	
Fats, oils and grease	1535	118193	520.427	118193	1423	118193	2745	
Ammonia (as N)	60	4728	277.561	4728	647	4728	173.37	
Orthophosphate (as P)	277	1182	416.341	1182	555	1182	287.00	
Total Metals	134	473	40.958	473		473	287	

IPC License Register Number PO 443 – 02
Section 2.5 - Emissions to Sewer: Non-Compliance Summary 2009.

Date	Non-Compliance	Cause	Corrective Action
N/A	N/A		

Total Number of Exceedences = 0 exceedences of IPPC Licence Limit.
0 exceedences of external EPA sampling

IPPC Licence Register No. PO443 -2
Waste Management Summary 2007

Section 2.6

C Code						Hazardous (Yes/No)	Description of Waste	Quantity (t/year)	Disposal/ Recovery Code	Location of Disposal/ Recovery	Name of Waste Disposal Recovery Contractor
0	2	0	3	0	4	No	Apple Leaf (Seasonal)	695.12	R10 - Disposal as Landspread	(b) Approved Landbanks Co. Kilkenny/ Tipperary	Farm Relief
0	2	0	7	0	4	No	Waste Cider	0	R10 - Disposal as Landspread	N/A	N/A
2	0	0	1	0	8	No	General Waste	148	D1 - landfill Disposal	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
0	2	0	5	0	7	No	Sludge	747	R10 - Disposal as Landspread	(b) Approved Landbanks Co. Kilkenny/ Tipperary	Farm Relief
1	5	0	1	0	1	No	Cardboard	302. 5	R12 - Recycled	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	5	0	1	0	7	No	Glass	1,196	R13 - Recycled	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	5	0	1	0	2	No	Plastic	54	R13 - Recycled	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	5	0	1	0	4	No	Aluminium	31.16	R13 - Recycled	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	5	0	1	0	1	No	Paper	32.95	R3 - Recycled	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	6	0	1	1	7	No	Scrap Metal		R4 - Recycling of metals	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	5	0	1	0	3	No	Wood	18.56	R3 - Recycled	(b) Luddenmore, Grange, Kilmallock, Co. Limerick	Mr. Binman
1	3	0	8	9	9	Yes	Waste Oil	945 litres	R9 - Used oil refining.	Shnannon Ind. Estate	ENVA
2	0	0	1	2	1	Yes	Fluorescent Tubes	476 tubes	R4- Recovery of mercury	(b) Davitt Road, Inchicore, Dublin 12	Contec Ltd.
1	5	0	1	1	0	Yes	Lab Smalls	0.4	D10 - Incineration on land	(b) Harrington Terrace, Dun Laoghaire, Co. Dublin	Minchem Environmental Services
1	0	0	6	0	1	Yes	Batteries	812kg	R4 - Recovery of lead by Smelter	(b) Unit A, Oldmill Industrial Estate,	Returnbatt Ltd.

Landspreading Summary

		Tonnes	Tonnes	Tonnes
Farm Code	**Farmer**	**2007**	**2008**	**2009**
1	Padraic Brennan	386.54	386.54	
9	James Tracy	312.08		
11	Brendan Russell	144.66	206.74	
12	Bertie Stanley	55.36		
13	Stephen Holohan	991.86		
14	Martin Healy		190.08	
15	Richard Daly		85.52	
16	John Stone		52.94	
17	Sean Grant		225.6	89.36
18	Liam Rockett		165.7	106.3
19	James Gaule		68.68	
20	Steven Kearns		72.66	
21	Walter Cleary			24.88
22	Michael Connolly			80.96
	Rockwell Storage	**881.88**		0
	Waddocks Comp.	**631.52**	**51.82**	0
	Galmoy Mines			0
	Bord na Mona			**393.62**
	Total:	**3403.9**	**1506.28**	**695.12**

IPPC Licence Register Number 443

Organic Waste Register Summary

Type	Recovery Agent	Application			
			2007	2008	2009
Sludge	Farm Relier Services	Landspreading	2078	879.42	747
Apple Leaf	Farm Relief Services	Landspreading	1293	337.56	695.12
		Total	**3371**	**1216.98**	**1442.12**

STORMWATER ANALYSIS - ANALYSIS

Bulmers Ltd. Grants of Ireland Ltd.					**Reg. No. 443**	
Emission Reference Point:				SW2		
Discharge Monitoring Point Location:				S36b		
Monitoring Period:				Daily - January 2009 - December 2009		
	Ref : Daily inspection of storm water Emissions ref 18. 12.50					
				Grab	**Composite**	
Date	**pH**	**oC**	**Visual**	**COD mg/l**	**COD mg/l**	**Comments**
	6.8 - 8.0	**<40**	**Inspection**	**Spec. 60mg/l**	**Spec. 60mg/l**	
11/01/2009	7.1	10	clear	56	41	
12/01/2009					No sample	Holiday cover
13/01/2009					No sample	Holiday cover
14/01/2009	6.9	12	clear	62	42	
15/01/2009	7.1	10	clear	63	45	
16/01/2009	7.23	11	clear	43	No sample	Sampler pump not working
18/01/2009	7.12	10	clear	45	No sample	Sampler pump not working
19/01/2009	7.13	9	clear	41	No sample	Sampler pump not working
20/01/2009	7.45	10	clear	46	No sample	Sampler pump not working
21/01/2009	6.93	11	clear	51	No sample	Sampler pump not working
22/01/2009	7.13	12	clear	16	No sample	Pump repaired by Gilroys
25/01/2009	7.18	10	clear	54	45	
27/01/2009	7.12	11	clear	53	39	
28/01/2009	7.11	10	clear	51	41	
02/02/2008	7.23	11	clear	32	16	
10/02/2009	7.11	13	clear	45	6	
11/02/2009	7.12	12	clear	52	41	
12/02/2009	7.18	11	clear	48	No sample	
14/02/2009	7.23	13	clear	41	No sample	
15/02/2009	7.18	12	clear	34	23	
16/02/2009	7.6	11	clear	45	28	
17/02/2009	7.12	12	clear	43	35	
18/02/2009	7.23	13	clear	41	29	
19/03/2009	7.04	11	Clear - no odour	52	35	
26/04/2009	7.21	14	Clear - no odour	49	No sample	
15/05/2009	7.23	15	Clear - no odour	51	No sample	

17/06/2009			Dry		No sample	
13/07/2009			Dry - only sediment visible		No sample	
14/08/2009	6.82	16.00	Sediment visible in sa	62	45	
18/09/2009			Dry - only possible to sample sediment		No sample	
02/11/2010	7.49	n/a		68	46	
11/12/2010			Not accessible due to flood waters.			
Parameter	**Max.**	**Min.**	**Average**			
ph	7.60	6.82	7.17			
Temp	16.00	9.00	11.60			
COD	68.00	16.00	47.85			

Section 2.11

Groundwater Monitoring Summary

There are 8 wells available for use. Only three of these wells are in use.

All production wells are monitored for sensory, microbiological and chemical quality on a daily, weekly and monthly basis respectively.

See section 4.7 for Drinking water directive results for PW3, RW3 & RW4.

IPPC Licence Register Number PO443-02
Annual Environment Report

Section 2.12

Agency Monitoring and Reporting

1. Emissions Sampling - Discrepancy

Results for Samples of Final Wastewater, as discharged to Sewer, and analysed by the Environmental Protection Agency refer to all parameters as outlined on schedule Schedule B(3) of the Company's IPC Licence

Oxidised Nitrogen, Nitrite and Chloride are all analysed.

Class of activity: 7.3, Commercial brewing and distilling, and malting in installations where the production capacity exceeds 100,000 tonnes per year

Sampling location: IPC-P0443-01-CS-1a, Showerings- P0443-01-CS-1a- Discharge to Sewer (Jan- December 2007.

Parameter		Units	Limits	23.09.2009	07.05.2009
F	Flow	m^3/hr	< 60	nm	nm
F	Temperature	°C	< 40	22.3	22.5
	Biochemical Oxygen Demand	mg/l O_2		8.5	12.6
	Chemical Oxygen Demand	mg/l O_2		50	60
	Ammonia	mg/l N	< 10	0.41	**0.045**
	Chloride	mg/l Cl		78	126
	Nitrite	mg/l N		0.061	0.001
	Ortho-Phosphate	mg/l P	< 2,5	0.75	0.051
	Total Oxidised Nitrogen	mg/l N		9.4	7.8
	pH	pH	>3 and < 10	8.3	8.1
	Suspended Solids	mg/l	1000	**15.0**	nm

	Parameter	Units	Limits	Dates sampled				
				20/09/07	19/11/07			
F	Flow	m^3/hr	< 60					
F	Temperature	°C	< 40		<22			
	Biochemical Oxygen Demand	mg/l O_2		30				
	Chemical Oxygen Demand	mg/l O_2		67	66			
	Ammonia	mg/l N	< 10	**49**	**0.099**			
	Chloride	mg/l Cl		33	33			
	Nitrite	mg/l N		14	1.7			
	Ortho-Phosphate	mg/l P	< 2,5	7.2	3.9			
	Total Oxidised Nitrogen	mg/l N		16	88			
	pH	pH	>3 and < 10	8.7	8.2			
	Suspended Solids	mg/l	1000	**<6**	<6			

Two exceedences reported dated 04/04/07 and 29/10/07. Bulmers responded to EPA on each of these exceedences. Exceedences on the 20/09/07 and 19/11/07 were raised at the EPA inspection audit in Feb 2008 and were responded as part of audit report response.

IPPC Licence Register Number PO443 –02
Annual Environment Report
Section 2.13

Environmental Non Compliance Summary 2009

Emissions to Sewer Non Compliances and Corrective Actions are outlined in Section 2.5

Date	Description	Non Compliance Category					Investigation / Notification
		Emissions to Sewer	**Noise**	**Monitor Equipment**	**Discharge to Surface Water**	**Environmental Complaint**	
See section	N/A	0	0	0	0	0	n/a

Table 2.13 Environmental Incident Summary 2009

Section 2.14

Environmental Complaints Summary

Environmental Complaints Summary 2002 - 2009

Date	Total Number of Complaints	Complaint Type				Investigation Complete	Report Issued	Signature
		Noise	Odour	Waste	Pollution			
2008	0	0	0	0	0	Not Applicable	Not Applicable	
2007	0	0	0	0	0	Not Applicable	Not Applicable	
2006	0	0	0	0	0	Not Applicable	Not Applicable	
2005	0	0	0	0	0	Not Applicable	Not Applicable	
2004	0	0	0	0	0	Not Applicable	Not Applicable	

IPC Licence Register Number 443 Section 2.15

Energy/ Resource Usage Summary

Resource	2009	2008	2007
Diesel (m^3 / year)			N/A
Gas (kWh / year)	19,447,346	21,494,177	25,688,442
Electricity (MWhr / year)	12,705	15,197	15,764
Carbon Dioxide (tonnes purchased/ year)	**1957**		4483

Table 2.15 Energy/ Resource Usage Summary

IPPC Licence Register Number 443

Water Consumption Summary - section 2.16

Water Source	2007	2008	2009
	m^3 per year	m^3 per year	m^3 per year
Groundwater Supply	467113	523,461	473,790
Municipal Supply	49947	27,784	20,857

Table 2.16 Water Consumption Summary

Section 3.1

Schedule of Environmental Objectives and Targets

Bulmers Ltd., Grants of Ireland Ltd.

IPC Licence Reg. No. 443

1.0 INTRODUCTION

The following *Schedule of Environmental Objectives and Targets* was prepared in fulfilment of Condition 2.2 of IPC Licence Reg. No. 443, concerning the activities of Bulmers Limited, Grants of Ireland Limited, located at Annerville, Clonmel, Co. Tipperary.

Bulmers Limited is operating under Integrated Pollution Control (IPC) Licence from the Environmental Protection Agency, granted March 29th, 2001, to carry out the activity of commercial brewing.

2.0 REFERENCE

Integrated Pollution Control Licence Reg. No. 443 - Condition 2.2:

2.2.1 The Licensee shall prepare a schedule of Environmental Objectives and Targets. The schedule shall include time frames for the achievement of set targets. The schedule shall address a five-year period as a minimum. The schedule shall be reviewed annually and amendments thereto notified to the Agency for agreement as part of the Annual Environmental Report (AER)

2.2.2 The Licensee shall have regard to those matters listed in the appropriate section of Schedule 5(I) Recording and Reporting to the Agency when establishing the schedule of Objectives and Targets.

3.0 ENVIRONMENTAL OBJECTIVES AND TARGETS

3.1 Schedule of Environmental Objectives and Targets

Consistent with the defined Company Environmental Policy, and the requirements of IPC Licence Reg. No. 443, specifically those defined in Schedule 5(i), the Company proposes the following Environmental Objectives and Targets

EMP CODE	OBJECTIVE CODE	OBJECTIVE TITLE	TARGET	START DATE	REVIEW DATE	RESPONSIBILITY
EMP 01	OBJ 01B	Reduce well water consumption and the generation of wastewater.	10% reduction in well water usage per million Liters produced by year-end 2010. 2009 Well-Water Usage: 3060 m^3 /million litres produced 2010 Target: 2754/ million litres produced.	January 2010	Monthly	S.Shine
EMP 02	OBJ 03B	Reduce Towns Water usage.	Reduce towns water consumption by 5% for 2010 vs. 2009. 2009 Town Water Usage: 141 m^3/million litres produced	January 2010	Monthly	S.Shine

			2010 Target: 134m^3/million litres produced			
EMP 03	OBJ 03A	Reduce waste sent to landfill for Bulmers.	5% reduction in waste to landfill per million Litres of Bulmers product produced vs.2009 2009 Waste to Landfill: 0.82Tonnes / Million Litres 2010 Target: 0.78Tonnes/Million Litres	Januar y 2010	Monthly	S.Shine
EMP 03	OBJ04A	Reduce disposal and recycling costs.	5% reduction in glass per million litres of bottled product in 2010 vs 2009. (2009: 7496 Kg / Million Litres Produced) 2010 Target: 7121Kg/Million Litres Produced	Januar y 2010	Monthly	S.Shine
EMP 03	OBJ04A	Reduce cardboard disposal and recycling costs.	Introduce measures so as not to exceed 2009 waste volumes for cardboard. **(**2009: 2203 Kgs Cardboard per Million Litres Produced)	Januar y 2010	Monthly	S.Shine

EMP 03	OBJ04A	Reduce plastic disposal and recycling costs.	Introduce measures so as not to exceed 2009 waste volumes for plastic. (2009: 439 Kgs plastic per Million litres Produced)	Januar y 2010	Monthly	S.Shine
EMP 05	OBJ04B	Reduce aluminum disposal and recycling costs.	5% reduction in aluminium per million litres of canned and bottled product in 2010 vs 2009 (2009: 191 Kgs of Aluminium Recycled per Million litres Produced) 2010 Target: 182 Kgs of Aluminium Recycled per Million litres Produced	Januar y 2010	Monthly	S.Shine,
EMP 06	OBJ 05A	Reduce Electricity consumption	2008: 79,906 kWh used per million litres produced. 2009 Performance : 71,916 kWh per million litres produced. 2010 target : 7.30 kwhr/hl	Januar y 2010	Monthly	S.Shine

EMP 06	OBJ 05B	Reduce Natural Gas Consumption	10% reduction in natural gas consumption for 2009 vs. 2008 for product produced 2009: 122,310 kWh used per million litres produced. 2010 Target: 110,079 kWh per million litres produced.Target of natural gas consumption for 2010 – 11.30kwhrs /hl produced.	January 2010	Monthly	S.Shine
	OBJ 06A	Introduce a site wide effective Environmental Awareness Training programme.	Enhance environmental awareness training within operations. Ensure 80% of people within operations will have received ISO 14001 Awareness Training and job specific training by March 2011.	January 2010	Monthly	S.Shine

Summary of Environmental Performance versus targets FY 2009/10.

KPI	FY 2008/09	FY2009 / 2010	Target 2009.	Target 2010
Waste to landfill (tonnage)	59	38	Zero Waste to landfill	**Zero Waste to landfill**
% recycling rate	98 %	99.2%	100% recycling / recovery / reuse.	**100% recycling**
General waste tonnage off site (Tonnage) .	197	185.8	177.3 tonnes (10% reduction)	**149**
Carbon footprint reduction (tonnes CO2)	14344	12196	15% achieved.	**10%**
Electricity usage (kwhr /hl)	9.26	7.87 (9.2% reduction)	7.80	**7.30**
Gas (kwhrs /hl)	13.04	11.84 (15% reduction)	12.26	**11.30**
Water usage Wellfield) hl/hl	3.31	3.08	3.16	**2.87**
Town water usage (m3 /yr)	27460	18620	N/A	**Eliminate usage of town water.**
Total BOD load to sewer (kg/yr)	12003	4798	50% reduction	**Maintain 2009 load to sewer.**
Treatment cost per m3	€0.94	€0.67	N/A	**€ 0.45**
Variable municipal operational costs.	€39,727.00	€32461.36	N/A	**€31,000**
Sludge generated (Tonnage)	879	747	800	**700**
% sludge sent for composting	0%	60%	N/A	**90% composting**

Significant Aspect: EMP 01 – WellWater Usage Reduction.	**Owner:** Suzanne Shine
Department/Area(s): Sitewide	**Process/Activity**: All applicable
Objective: Reduce wellwater consumption and the generation of wastewater.	**Target:** 10% reduction in wellwater usage per million litres produced by year end 2010. (Target = 2754 m^3 /million litres produced)
Date: 9th April 2010	
Team Members: Suzanne Shine, , Gary Tantrum, Piotr Kuytz	

Program Plan:
Wellwater Usage Reduction Programme

Task	Responsible Party	Schedule	Performance Monitoring	Comments
Identify areas, operations, processes or machinery that contributes to significant water usage.	SS	January 2008	Complete	N/A
Implement site wide water-shutdown procedure for non-production hours	Gary Tantrum	Feb 2008	Weekend & Overnight water usage to be recorded.	N/A
Site water system has been mapped to give clearer picture of water piping network.	C.Jones (U.K. Eng)	Feb.2008.		
Identify suitable locations for the installation of 14 new flowmeters, which will generate automatic reports.	P.Morrissey	January 2008	Installation completed.	

Task	Responsible Party	Schedule	Performance Monitoring	Comments
Daily wellwater usage per area is recorded and a report is issued to all section managers weekly. High users are targeted for reduction projects.	P.Morrissey	Ongoing	Daily	
Assess possibility of recycling water used in certain operations. i.e. from bottle rinsers, bottle washers, can pasteuriser, CO_2 recovery, PF Filters, CIP Pre-rinses.	P.Morrissey, D.Ryan (Water Tech)	April 2008	Discharge samples from various processes are being tested for reuse suitability.	
Ongoing Project: Installation of water control valve on CO_2 Gas Washer. This will ensure that the aerosol gas washer only uses the required amount of water for any cycle.	G.Tantrum	June 2009	Complete	

Significant Aspect: EMP 02 – Reduce Towns Water Usage	**Owner:** Pat Morrissey
Department/Area(s): Sitewide	**Process/Activity**: All applicable
Objective: Reduce Towns Water Usage	**Target:** Reduce Towns Water Usage by 5% for 2010 vs. 2009. 2010 Target: 134 m^3 / million litres produced
Date: 23rd January 2008	
Team Members: Suzanne Shine, Gary Tantrum	
Program Plan: Town Water Reduction Programme	

Task	Responsible Party	Schedule	Performance Monitoring	Comments
Identify areas where wellwater can be used in place of town water.	P.Morrissey	March 2008	Complete	N/A
Main area where town water is used is Grants Factory. RO water replaces town water for splitting of whiskey.	P.Morrissey	March 2008	Complete	N/A

Task	Responsible Party	Schedule	Performance Monitoring	Comments
Town water usage is monitored weekly and reported monthly to management.	S.Shine	Ongoing.	Daily	

Bulmers and Grants Of Ireland Ltd
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Significant Aspect: EMP 04 - Energy Usage.	**Owner:** Suzanne Shine
Department/Area(s): Sitewide	**Process/Activity**: All applicable
Objective: Reduce energy consumption	**Target:** Continuous Improvement
Date: 15th January 2008	
Team Members: Suzanne Shine, Vincent Ryan , Gary Tantrum	
Program Plan: Energy Reduction Program	

Task	Responsible Party	Schedule	Performance Monitoring	Comments
Site Audit – Benchmark	F.O'R. & G.D.	April 2008	Complete	N/A
Compile Data Figures for 2008 Benchmark Figures	C.R. & G.D.	Ongoing	Complete	N/A
Establish On Site Energy Management Team	F.O'R. / PM	January 2008	Complete	N/A
Install Meters on Energy Usage Points	PM	May 2008	Complete	N/A

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Environmental Management Program Register

Task	Responsible Party	Schedule	Performance Monitoring	Comments
Installation of Energy Management Tracking System.	PM	September 2008	Complete	Gives very good traceability of electricity usage.
Initiative on weekend shutdown. Communicate via email.	PM	October 2008	Weekend audits by Energy Team Members.	Seeing a good reduction since start of initiative.
Achieve accreditation to IS393 energy management system	PM/SS	April 2009	Achieved	
New Control System on chilled water distribution pumps.	PM	June 2009	Complete	
Installation of Automatic Valves on Steam Header Lines.	PM	September	Complete	
Chilled water Plant Control System Overhaul	PM	Commneced Feb 2010	Ongoing	

Bulmers and Grants Of Ireland Ltd
Environmental Management Program Register

KCD Farm Relief Services

Nutrient Management Plans for Bulmers Clonmel.

IPC REG NO : PO 443-02

2010

KILKENNY/CARLOW & DISTRICT FARM RELIEF SERVICES SOCIETY LTD.

Cillin Hill,
Dublin Road,
Kilkenny.

Piltown,
Co. Kilkenny.

Tullow,
Co. Carlow.

Tel: 056 7761671
Fax: 056 7764381

Tel: 051 643111

Tel: 059 9152444

To Whom It May Concern:

I have completed Fertiliser Plans (Nutrient Management Plans) for farm references BU101, BU103, BU104, BU105, BU106, BU107 and BU108 to receive organic fertiliser from IPC licensed site Bulmers, Clonmel, Co Tipperary, IPC Reg Number P0443 – 02 during 2010.
These Fertiliser Plans comply with the requirements of the European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2006 (S.I. No. 378 of 2006).

In my professional opinion, organic fertiliser may be used to fertilise any of those farmlands, and the application of organic fertiliser from the licensable site to any of those lands in a quantity identified in the Fertiliser Plan and manner that complies with the requirements of the Code of Practice and Buffer Zones of IPC licence Reg. No. P0443-02, and European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2006 (S.I. No. 378 of 2006), will not cause, and is not likely to cause, significant environmental pollution.

Signed

Louise Mahony.

Louise Mahony,(Operations Co-ordinator)
B Ag Sc (Hons),
17/02/2010.

Patrick O'Gorman(Operations Manager)
B.Eng (Hons)
17/02/2010

Summary Table / Customer List Bulmers 2010

Farmer Reference Code	Townland(s) where organic fertiliser may be spread	County where organic fertiliser may be spread	Total amount of organic fertilizer that may be spread (m3)
BU101	Miltown, Kilmacow	Kilkenny	24.70
BU103	Miltown, Kilmacow	Kilkenny	132.66
BU104	Skeard	Kilkenny	105.69
BU105	Blossom Hill	Kilkenny	61.18
BU106	Rahard, Mullinavat	Kilkenny	123.77
BU107	Ballinearla	Kilkenny	33.76
BU108	Dunkitt	Kilkenny	28.15
			509.91

Total recovery capacity (m3) this Batch	510	
Total **organic fertilizer** produced per year (m3)	800	Approx
P content of the **organic fertilizer** (kg P/m3)	9.30	
N content of the **organic fertilizer** (kg N/m3)	5.30	

Also the Total of the Recovery capacity is less than the Total produced this is due to the fact that a large proportion of the organic fertilizer is sent to Bord Na Mona for Composting.

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU101 Sean Grant

Farmer/Land Owner Address: Miltown, Kilmacow, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
1	9.80	9.80	13.6	13-Jan-10	4	Grassland	0	9.71	4.97	0.00	0	0.00
2	1.37	1.37	3.6	13-Jan-10	2	Grassland	25	9.71	4.97	2.15	20.03	2.95
3	5.25	5.25	6.0	13-Jan-10	3	Grassland	15	9.71	4.97	0.00	0.00	0.00
4	2.24	2.24	23.0	13-Jan-10	4	Grassland	0	9.71	4.97	0.00	0	0.00
5	1.81	1.81	17.0	13-Jan-10	4	Grassland	0	9.71	4.97	0.00	0	0.00
6	10.3	10.1	3.6	13-Jan-10	2	Grassland	25	9.71	4.97	2.15	20.03	21.75
6 fields	30.77	30.57										24.70

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	90
Imported Organic N/ha	4

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU103 Liam Rocket

Farmer/Land Owner Address: Miltown, Kilmacow, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
5	8.96	8.96	4.9	13-Jan-10	2	Grassland	29	14.13	6.71	2.40	22.29	21.48
6	11.31	11.31	6.3	13-Jan-10	3	Grassland	19	14.13	6.71	1.32	12.29	14.95
7	7.69	7.69	8.8	13-Jan-10	4	Grassland	0	14.13	6.71	0.00	0	0.00
8	1.80	1.80	7.8	13-Jan-10	3	Grassland	19	14.13	6.71	1.32	12.29	2.38
9	5.30	5.30	7.8	13-Jan-10	3	Grassland	19	14.13	6.71	1.32	12.29	7.00
10	3.61	3.61	7.5	13-Jan-10	3	Grassland	19	14.13	6.71	1.32	12.29	4.77
11	6.38	6.38	7.8	13-Jan-10	3	Grassland	19	14.13	6.71	1.32	12.29	8.43
12	4.66	4.66	4.7	13-Jan-10	2	Grassland	29	14.13	6.71	2.40	22.29	11.17
13	12.50	12.50	7.5	13-Jan-10	3	Grassland	19	14.13	6.71	1.32	12.29	16.52
14	4.80	4.80	3.0	13-Jan-10	1	Grassland	39	14.13	6.71	3.47	32.29	16.67
15	8.44	8.44	2.8	13-Jan-10	1	Grassland	39	14.13	6.71	3.47	32.29	29.30
15 fields	75.45	75.45										132.66

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	131
Imported Organic N/ha	9

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU104 Michael Connolly

Farmer/Land Owner Address: Skeard, Kilmacow, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
1	7.84	7.84	22.7	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
2	9.22	9.22	5.9	13-Jan-10	3	Grassland	19	14.13	6.4	1.35	12.6	12.49
3a	9.00	9.00	12.0	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
3b	6.84	6.84	15.0	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
4a	10.00	10.00	8.1	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
4b	12.15	12.15	4.9	13-Jan-10	2	Grassland	29	14.13	6.4	2.43	22.6	29.53
5	0.57	0.54	5.1	13-Jan-10	3	Grassland	19	14.13	6.4	1.35	12.6	0.73
6	1.54	1.54	1.4	13-Jan-10	1	Triticale	39	14.13	6.4	3.51	32.6	5.40
7	1.15	1.15	>30	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
8	4.89	4.88	4.4	13-Jan-10	2	Triticale	29	14.13	6.4	2.43	22.6	11.86
9	0.83	0.83	4.4	13-Jan-10	2	Triticale	29	14.13	6.4	2.43	22.6	2.02
10	4.59	4.40	3.7	13-Jan-10	2	Triticale	29	14.13	6.4	2.43	22.6	10.69
11	1.16	1.16	8.3	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
12	1.71	1.71	3.7	13-Jan-10	2	Grassland	29	14.13	6.4	2.43	22.6	4.16
13	1.89	1.89	2.4	13-Jan-10	1	Grassland	39	14.13	6.4	3.51	32.6	6.63
14	3.48	3.48	2.4	13-Jan-10	1	Grassland	39	14.13	6.4	3.51	32.6	12.20
15	2.85	2.85	2.4	13-Jan-10	1	Grassland	39	14.13	6.4	3.51	32.6	9.99
16	5.72	5.72	9.1	13-Jan-10	4	Grassland	0	14.13	6.4	0.00	0	0.00
17 fields	85.43	85.20										105.69

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	131
Imported Organic N/ha	7

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU105 Walter Cleary

Farmer/Land Owner Address: Blossom Hill, Kilmacow, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
1	1.45	1.45	5.3	13-Jan-10	3	Grassland	15	8.65	4.99	1.08	10.01	1.56
2	2.62	2.62	5.3	13-Jan-10	3	Grassland	15	8.65	4.99	1.08	10.01	2.82
3	5.48	5.48	8.1	13-Jan-10	4	Grassland	0	8.65	4.99	0.00	0	0.00
4	5.23	5.16	3.9	13-Jan-10	2	Grassland	25	8.65	4.99	2.15	20.01	11.10
5	19.64	19.17	4.7	13-Jan-10	2	Grassland	25	8.65	4.99	2.15	20.01	41.25
6	2.07	2.07	4.3	13-Jan-10	2	Grassland	25	8.65	4.99	2.15	20.01	4.45
6 fields	36.49	35.95										61.18

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	80
Imported Organic N/ha	9

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU106 Peter Sutton

Farmer/Land Owner Address: Rahard, Mullinavat, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
1	10.00	10.00	1.7	04-Apr-08	1	Grassland	35	8.91	4.04	3.33	30.96	33.29
2	8.37	8.37	8.7	04-Apr-08	4	Grassland	0	8.91	4.04	0.00	0	0.00
3	10.20	10.20	2.4	04-Apr-08	1	Grassland	35	8.91	4.04	3.33	30.96	33.96
4	5.70	5.70	3.0	04-Apr-08	1	Grassland	35	8.91	4.04	3.33	30.96	18.98
5	4.20	4.20	9.3	04-Apr-08	4	Grassland	0	8.91	4.04	0.00	0	0.00
6	3.97	3.97	3.8	04-Apr-08	2	Grassland	25	8.91	4.04	2.25	20.96	8.95
7	5.40	5.40	3.7	04-Apr-08	2	Grassland	25	8.91	4.04	2.25	20.96	12.17
8	2.77	2.77	2.4	04-Apr-08	1	Grassland	35	8.91	4.04	3.33	30.96	9.22
9	3.20	3.20	4.8	04-Apr-08	2	Grassland	25	8.91	4.04	2.25	20.96	7.21
9 fields	53.81	53.81										123.77

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	83
Imported Organic N/ha	12

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU107 James Gaule

Farmer/Land Owner Address: Ballinearla, Kilmacow, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
1	6.67	6.67	9.9	13-Jan-10	4	Grassland	0	12.63	7.75	0.00	0	0.00
2	3.12	3.12	26.7	13-Jan-10	4	Grassland	0	12.63	7.75	0.00	0	0.00
3	6.26	6.26	3.1	13-Jan-10	2	Grassland	25	12.63	7.75	1.85	17.25	11.61
4	4.69	4.69	4.1	13-Jan-10	2	Grassland	25	12.63	7.75	1.85	17.25	8.70
5	4.59	4.59	1.6	13-Jan-10	1	Grassland	35	12.63	7.75	2.93	27.25	13.45
6	4.98	4.98	10.0	13-Jan-10	4	Grassland	0	12.63	7.75	0.00	0	0.00
6 fields	30.31	30.31										33.76

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	117
Imported Organic N/ha	6

Attachment 1: Table 11B (ii) for NMP calculations

Farmer/Land Owner Name: BU108 Steven Kearns

Farmer/Land Owner Address: Dunkitt, Kilmacow, Co.Kilkenny.

Field ID	Total Area ha	Usable Area ha	Soil P Test mg/P/l	Date of Soil Test	P Index	Crop	P Req. kg P/ha	N in on-farm Slurry kg N/ha	P in on-farm Slurry kg P/ha	Imported organic fertilizer to be applied m3/ha	Imported P to be applied kg P/ha	Total imported organic fertilizer per plot (m3)
1	0.61	0.61	6.7	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	0.71
2	0.93	0.93	6.7	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	1.08
3	1.01	1.01	13.9	13-Jan-10	4	Grassland	0	10.3	4.23	0.00	0	0.00
4	1.01	1.01	13.9	13-Jan-10	4	Grassland	0	10.3	4.23	0.00	0	0.00
5	2.26	2.26	6.3	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	2.62
6	2.23	2.23	4.7	13-Jan-10	2	Grassland	25	10.3	4.23	2.23	20.77	4.98
7	2.43	2.43	7.2	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	2.81
8	2.23	2.23	4.3	13-Jan-10	2	Grassland	25	10.3	4.23	2.23	20.77	4.98
9	3.44	3.44	4.7	13-Jan-10	2	Grassland	25	10.3	4.23	2.23	20.77	7.68
10	1.62	1.62	5.1	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	1.88
11	1.62	1.62	14.3	13-Jan-10	4	Grassland	0	10.3	4.23	0.00	0	0.00
12	0.61	0.61	5.3	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	0.71
13	0.61	0.61	5.3	13-Jan-10	3	Grassland	15	10.3	4.23	1.16	10.77	0.71
13 fields	20.61	20.61										28.15

Concentration of P in organic fertilizer kg P/m3	9.3
Concentration of N in organic fertilizer kg N/m3	5.3
On Farm Organic N/ha	84
Imported Organic N/ha	7

Bulmers Annerville

ENVIRONMENTAL LIABILITIES RISK ASSESSMENT

(Prepared in the Context of Condition 12.3 of IPPC Licence Register No. P0443-02)

Document No.: 382-X009
FBS: 07.01.11
Date: July 2009

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LP Ó Cléirigh, BE, MEngSc, MBA, C Eng, MIEI.

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This report has been prepared by Byrne Ó Cléirigh Limited with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporating our Terms and Conditions and taking account of the resources devoted to it by agreement with the Client.

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This report is confidential to the Client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

1 INTRODUCTION

1.1 Requirement for an ELRA

In June 1998 Bulmers (trading as Showerings (Ireland) Limited and Grants of Ireland) applied to the Environmental Protection Agency for an IPC licence for its site at Annerville, Clonmel. In March 2001 the Agency granted a licence, register number P0443-01, under Class 7.3 *commercial brewing and distilling, and malting in installations where the production capacity exceeds 100,000 tonnes per year*.

In May 2006 Bulmers applied to the Agency for a licence review for the Annerville site in order to take into account a variety of changes and expansion at the site, including a new bottling line, additional warehousing, additional maturation and fermentation tanks, new fermentation plant, new apple crushing presses and an upgrade to the wastewater treatment plant (WWTP).

The Agency granted the revised licence, P0443-02, in December 2006 under:

Class 7.3.1: *cider and perry production in installations where the production capacity exceeds 25 million litres per year, not included in paragraph 7.8*, and

Class 7.8: *processes for the purposes of production of food products from vegetable raw materials with a finished product production capacity greater than 300 tonnes per day*.

Condition 12.3 of this licence (Environmental Liabilities) states:

> *The licensee shall as part of the AER provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents / incidents, as may be associated with the carrying on of the activity.*

While there is no requirement within the licence to prepare an Environmental Liabilities Risk Assessment, Byrne Ó Cléirigh was requested to prepare such an assessment on behalf of Bulmers Annerville in the context of Condition 12.3 of the licence, above, and the Agency's circular letter to licenced sites dated 27th August 2008 regarding Environmental Liability Risk Assessment (ELRA), Residuals Management Plans (RMP), Closure Remediation and Aftercare Plans (CRAMP) and Financial Provision (FP).

This ELRA has been prepared in accordance with the Agency's guidance document *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)*.

1.2 Statement of Capability and Independence of Byrne Ó Cléirigh

Byrne Ó Cléirigh (BÓC) is an independent firm of engineering and management consultants specialising in the Energy, Environmental and Risk Management areas since 1981. We have carried out numerous environmental and risk assessment projects including due diligence, environmental impact assessment, site investigation and remediation, risk assessment including quantitative risk assessment, and licensing and permitting. We have particular expertise in the drinks manufacturing sector.

The company is wholly owned by its senior professional staff and has no commercial or financial links with any other body.

BÓC has completed a number of projects and studies for the Bulmers Annerville site, including the preparation of an IPPC licence review application in 2006, an Energy Audit in 2007 and preparation of a Residuals Management Plan in the context of Condition 10 of the revised licence.

2 SITE OPERATIONS

2.1 Principal Activities

The principal activities at the Bulmers Annerville site can be categorised as follows:

- The manufacture, packaging and distribution of the Bulmers cider and perry brands.
- The production and packaging of spirits and the wholesaling and distribution of wines and spirits.

Bulmers operates a comprehensive Environmental, Health & Safety Management System. This system is certified to both ISO 14001 and OHSAS 18001.

A site plan is provided in Appendix 1.

2.2 Production Activities

Currently, all of the company's production activities are carried out at the Annerville site. The main unit operations carried out at the site are:

- Apple intake and seasonal apple crushing
- Cider fermentation / maturation
- Perry fermentation
- Beverage make up
- Packaging (bottling, canning, kegging)
- Warehousing & Logistics

In addition to the Bulmers unit operations, Grants of Ireland, which is also located on the site, carries out the following unit operations:

- Spirits and liquor intake and storage
- Spirits and liquor make up
- Packaging

The Annerville site also incorporates some of the orchards owned by Bulmers.

2.3 Ancillary Services and Facilities

A range of services unit operations are also carried out at the site to support the production activities. These service operations include:

- Water supply, treatment, and distribution
- Natural gas fired boilers and biogas fired boiler
- Refrigeration (primary: ammonia; secondary: glycol)
- Compressed air
- Cleaning-in-place (CIP)
- Carbon dioxide storage and distribution
- Effluent treatment (see Section 2.6)

2.4 Materials Handling and Storage

A variety of materials are used in the production and services activities at the site, including both liquids and solids. The primary raw material used in the production process is apples, while the main liquid raw materials used at the site are citric acid (used in the Bulmers operation) and spirit (ethanol) (used in the Grants operation).

2.4.1 Product Tanks

There are in excess of five-hundred storage tanks at the Bulmers's site used to store both raw materials and finished product. The majority of the storage tanks are maturation tanks, accounting for over three hundred. The largest product tanks have capacities of 250,000 gallons (1,125 m^3) and are used to store product during maturation.

Table 1 summarises the main product storage tanks at the site.

Table 1: Summary of Main Product Storage Tanks

Tank Description	Tank Capacity (litres)	Number of Tanks	Tank Description	Tank Capacity (litres)	Number of Tanks
Juice Processing	200,000	6	Fresh Juice Fermentation	290,000	90
Hydrol	72,000	5	Maturation Tanks	290,000 1,125,000	332 2
Concentrate Storage	36,000 135,000	3 4	Concentrate Fermentation	135,000 315,000	18 20
Water Storage	54,000	1	Concentrate Racking	315,000	18
Tanker Filling	135,000	3	Unfiltered Bulk Blend	290,000	27
Specialised Fermenters	54,000	4	Filtered Bulk Blend	290,000	11
Juice Intake Buffer	10,000 100,000	1 1			

The main product tank farm is located within a number of common bunded / kerbed areas, with the surrounding areas draining to the attenuation ponds to the south which, in turn, discharge to the River Suir or, in the event of contamination of surface water, can be diverted to the site's WWTP which subsequently discharges to the municipal WWTP.

2.4.2 Raw Materials and Ancillary Tanks

Table 2 summarises the bunded areas at the site that contain production raw materials, bulk chemicals and oils. The largest tank has a capacity of 130 m^3 and contains spirit.

Table 2: Summary of Raw Materials & Ancillary Bunded Areas

Bunded Location	Bund Volume (m^3)	Material Stored
Process Area	7.6	Citric Acid
Chemical Compound (remote)	79	Caustic
New Manufacturing Unit	13	Sodium Hydroxide
New Process Area	39	Citric Acid
Grants Production Area	39	Spirit

2.4.3 Packaged Materials

In addition to the production raw materials, a variety of packaged liquid chemicals are used in the WWTP, for cleaning in place (CIP) and ancillary services. These chemicals include dilute acids and bases, anti-foaming agents and detergents. The largest container of packaged chemicals is a 1,000 litre IBC. Table 3 lists the types of chemicals used and stored at the site.

Table 3: Main Chemicals Used and Stored at the Annerville Site

1,000 litre IBC	200 litre drum	25 litre drum
Antifoaming emulsion	Biocide	Bleach liquor
Caustic potash liquor	Lubricant	Citric acid
Caustic soda liquor	Sodium bisulphite	Methyl ester / ethyl lactate
Ferric Chloride		Sodium Hypochlorite
Hydrochloric acid		
Hydrogen Peroxide		
Peracetic Acid		
Phosphoric Acid		
Urea		

None of the chemicals listed in Table 3 have been assigned an environmental risk phrase (such as *toxic to aquatic* organisms, *harmful to aquatic* organisms or *may cause long term adverse effects in the aquatic* environment) and, while high concentrations of some of the chemicals present a risk to the environment, the Material Safety Data Sheets recommend that in the event of a small spill the material should be diluted and washed away. For larger spills it is recommended that the spill be contained and kept away from drains and from entering watercourses.

2.5 Pipelines

Liquid raw materials and intermediate and finished products are transferred around the site via aboveground pipelines, while bulk chemicals are also transferred in this manner. The majority of packaged liquid chemicals are transferred from storage areas to close to their point of use by forklift truck, from where they are transferred by pipeline to the point of use.

Carbon dioxide (CO_2) collected from the fermentation process is transferred to the CO_2 recovery unit by pipeline. The ammonia and glycol refrigerants are also transferred throughout the refrigeration systems via aboveground pipelines.

Apart from drains, there are no underground pipelines at the site.

2.6 Drainage and Wastewater Treatment Plant

Between 2002 and 2004, the on-site WWTP was upgraded, with further upgrade works taking place in 2006 which included the addition of an anaerobic pre-treatment plant. While the plant is capable of treating all the effluent from the site, the effluent from the WWTP is sent to the Clonmel Borough Council sewerage treatment works for final treatment before being discharged to the River Suir.

During the design of the upgrade works to the plant, the production and storage areas of the site were divided into eight zones in order to identify their respective drainage routes. These areas are listed in Table 4. Part of the surface water collection system on the site is directed to the WWTP, with the remainder of the surface water routed to two attenuation ponds on the site prior to discharge to the River Suir. There is a facility to divert the surface water from the attenuation ponds to the effluent treatment plant in the event of contamination of the surface water.

Table 4: Zoning of Drainage Areas to WWTP and Attenuation Ponds

Zone	Description of Drained Area	Discharges to
1	Automated warehouse	SW [1 attenuation pond
2	Northern car park	WWTP [2
3	Bottling and warehouse areas, office area and general hardstanding / paved surfaces	SW attenuation pond
4	Full goods warehouse and eastern part of bottling lines 3 to 6	WWTP
5	The new (western) tank farm area and apple offload area.	TF [3 attenuation pond
6	Existing (old) tank farm area.	WWTP
7	Existing older area of plant	WWTP
8	Existing car park and temporary warehouse north of Glasshouse	WWTP

[1: South West
[2: Wastewater Treatment Plant
[3: Tank Farm

The South West and Tank Farm attenuation ponds have capacities of 13,098 m^3 and 7,318 m^3, respectively, giving a combined capacity of 20,416 m^3. The Fire Water Risk Assessment carried out by Malone O'Regan in February 2008 concluded that the maximum retention volume required in the event of a fire at the site, combined with the 20-year return period storm and rainfall for 24 hours was 19,676 m^3.

3 SITE CHARACTERISTICS

3.1 Description

The Annerville site is located approximately 2 km to the east of Clonmel Town. The site covers an area of approximately 62 hectares on the northern side of the N24, consisting of the production, storage and administration areas, which covers approximately 10 hectares. There is an additional 4.5 hectare site immediately to the south of the N24 consisting of the WWTP and associated facilities. This area also includes the two attenuation ponds for surface water and some of the orchards owned by Bulmers.

The production, storage and administration areas on the main site consist primarily of hardstanding (roadways, bunded areas) and buildings, with the remaining 52 hectares comprising fields, some of the orchards owned by Bulmers, and Annerville House.

3.2 Site History

Bulmers acquired a greenfield site at Annerville, on the outskirts of Clonmel, in 1965 for the construction of a cider manufacturing facility. This was in addition to their existing facility at Dowd's Lane in the centre of Clonmel. Over time, many of the production operations moved from Dowd's Lane to the Annerville site and, currently, all of the company's juice fermentations, perry fermentations, bulk blending, bottling, canning and kegging operations are located at the Annerville site. In addition, seasonal apple crushing operations and cider maturation are carried out, while the site also incorporates some of the orchards owned by Bulmers.

In 2006, a major development was undertaken on the site, which included the following:

- Installation of a new bottling line;
- Provision of an additional warehousing and new hardstanding;
- Installation of new apple receiving pits and additional apple crushing presses;
- Expansion of the tank farm;
- Upgrading of the Wastewater Treatment Plant;
- Construction of a new fermentation plant;
- General site development, including the provision of a new car park, new internal roads and a new site entrance.

3.3 Environmental Sensitivity Evaluation

The available geological information from the Geological Survey of Ireland (GSI) indicates that bedrock beneath the site comprises Waulsortian Limestone. There are two limestone aquifers below the site: the Lower Carboniferous Waulsortian (WA) and Ballysteen (BA). The WA aquifer is classified as regionally important with good development potential, while the BA aquifer is classified as a locally important aquifer, moderately productive in only local zones. South Tipperary does not have a groundwater protection scheme and therefore an aquifer vulnerability map has not been competed. However, the GSI's interim vulnerability map categorises the vulnerability of the groundwater as high to low.

There are a total of eight groundwater abstraction wells available for use at the site, up to three of which may be in use at any one time. The GSI's groundwater public viewer indicates that abstraction wells in the vicinity of the Annerville site have a poor to moderate yield.

3.4 Hydrogeological Investigations

A number of investigations have been carried out at the Annerville site over the years to assess the groundwater, soils and geology underlying the site. In 2002, O'Neill Groundwater Engineering (OGE) carried out a hydrogeological investigation in accordance with Condition 9.3.3 of the original IPC licence. In 2006, OGE prepared the Soils, Geology and Hydrogeological sections of the Environmental Impact Statement for the expansion of the Annerville site[1]. This section of the EIS summarised the findings from the previous investigations and assessed the potential impacts from the proposed development.

A total of 5 potential sources of groundwater contamination were identified at the site:

- Factory Site
- Hydrocarbon Storage Tanks
- Landfill
- Septic Tanks
- Farm Chemical Applications

The risk of environmental damage from each of these areas is summarised in Table 5.

[1] EIS for Proposed Extension of Manufacturing Facility at Annerville, Clonmel, Tipperary – Soils, Geology and Hydrogeology Section, O'Neill Ground Water Engineering, June 2006.

Table 5: Summary of Potential Sources of Groundwater Contamination

Area	Potential for Environmental Liability
Factory Site	OGE concluded that, as the production areas of the site are comprised of hardstanding and that any surface water or accidental releases would be directed into the drainage system, the risk to the aquifer is considered to be low.
Hydrocarbon Storage Tanks	As all oil storage tanks at the site are bunded, OGE concluded that the risk to groundwater is low.
Landfill	The landfill is an existing feature of the site and is no longer in use. It is assessed in more detail in the Residuals Management Plan for the Annerville site.
Septic Tanks	OGE concluded that the septic tanks serving Annerville House (the septic tank serving the production area was subsequently decommissioned) are not a risk to groundwater as the effluent is pumped to the site's WWTP for treatment.
Farm Chemical Application	Of the three chemicals applied in the farm areas, it is considered that two do not degrade easily, with half lives of 10 and 175 days. However, it is considered that they would break down in the soil and therefore would not impact on the groundwater. OGE note that there have been no incidences of fungicide or insecticide in the groundwater and that nitrate levels from routine groundwater monitoring do not suggest an over application of fertiliser.

4 INITIAL SCREENING & OPERATIONAL RISK ASSESSMENT

The Agency's guidance document[2] provides for an initial step to determine the risk category for a site which, in turn, is used to determine the type and scope of the Plan. The three aspects of a facility that are used to classify it in terms of risk category are Complexity, Environmental Sensitivity and Compliance Record.

4.1 Complexity

The Annerville site is licensed under two IPPC activities: a Class 7.3.1 activity and a Class 7.8 activity. Under the EPA's guidance, these activities are assigned the following Complexy Bands:

Table 6: Complexity Band

No.	Activity	Band
7.3.1	Brewing (including cider and perry production) in installations where the production capacity exceeds 25 million litres per year.	G3
7.8	(b) vegetable raw materials with a finished product production capacity greater than 300 tonnes per day (average value on a quarterly basis).	G2

The guidance states that where more than one scheduled activity is located at a facility, then the highest Complexity Band is applied, which is G3 in this case. This band corresponds to a Complexity Score of 3.

4.2 Environmental Sensitivity

In calculating the Environmental Sensitivity of the site, each of the six main environmental categories has been assessed, as summarised in Table 7 overleaf. The total Environmental Sensitivity score for the site is 10, corresponding to an Environmental Sensitivity classification of Moderate (2). This classification applies to a site with an Environmental Sensitivity score in the range 7 – 12.

[2] Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)

Table 7: Environmental Sensitivity

Category		Environmental Attribute Score
Human Occupation[1]		3
Groundwater Protection	– Aquifer[2]	2
	– Vulnerability[3]	2
Sensitivity of Receiving Waters[4]	– Class	0
	– Coastal / Estuarine	0
Air Quality & Topography[5]		0
Protected Ecological Sites & Species[6]		1
Sensitive Agricultural Receptors[7]		2
Total		**10**

1) There are occupied buildings within 250 m of the Annerville site.
2) The GSI's National Bedrock Aquifer Map categorises the underlying bedrock as a regionally important aquifer.
3) The GSI's Interim Vulnerability Map categorises the vulnerability of the groundwater as high to low, noting that only an interim study took place. In calculating the Environmental Sensitivity of the site, we have adopted the conservative *high* vulnerability.
4) The site does not discharge to coastal or estuarine waters and is not within the catchment of EPA Surface Water Classification (1996).
5) The surrounding area is considered to be simple terrain as per the categories defined in the guidance document.
6) The site is less than 1 km from the River Suir, parts of which are designated as a candidate Special Area of Conservation, both upstream and downstream from Clonmel.
7) Agricultural activities take place immediately adjacent to the site.

4.3 Compliance Record

In 2008, Bulmers recorded 3 non-compliances in relation to licensed emissions and therefore, in accordance with the guidance document, the site would be considered to have a Compliance Record of Minor Non-Compliant, corresponding to a compliance score of 3.

4.4 Risk Category

The Risk Category for a site is determined by the product of:

$$Complexity \times Environmental\ Sensitivity \times Compliance\ Record$$

Applying the individual scores for Complexity, Environmental Sensitivity and Compliance yields an Overall Risk Score of 18, resulting in a Risk Category 2 (which has a range from 5 to 23). This is summarised in Table 8.

Table 8: Initial Risk Category for Bulmers Annerville

Parameter	Band / Rating	Score
Complexity	G3	3
Environmental Sensitivity	Moderate	2
Compliance Record	Minor Non Compliant	3
Overall Risk Score		*18*
Risk Category		**Category 2**

5 SCOPE AND METHOD OF ASSESSMENT

The Agency's guidance document states that, for Risk Category 2 (medium risk) sites, the potential for unplanned events to occur that could result in an unknown liability need to be considered and financial provision must be in place to cover such eventualities. However, the guidance document also states that there is no need to conduct a detailed ELRA for the majority of medium risk facilities.

In preparing this ELRA, Byrne Ó Cléirigh has adopted its in-house methodology for assessing the risk of potential environmental incidents, which includes the following tasks:

- Identifying potential environmental incidents that may arise during operation of the site.
- Quantifying the environmental impacts of such incidents.
- Calculating the value of financial provisions required to cover unknown liabilities.

This methodology is consistent with that set out in the Agency's guidance document. Tables 9 and 10 list the classifications that we have used for the likelihood (frequency) and consequence (severity) of potential environmental incidents.

Table 9: Risk Classification - Occurrence

Rating	Category	Description	Likelihood of Occurrence (%)
1	Very Low	Very low chance (0-5%) of hazard occurring in 30-year period*	0 – 5
2	Low	Low chance (5-10%) of hazard occurring in 30-year period	5 – 10
3	Medium	Medium chance (10-20%) of hazard occurring in 30-year period	10 – 20
4	High	High chance (20-50%) of hazard occurring in 30-year period	20 – 50
5	Very High	Greater than 50% chance of hazard occurring in 30-year period	> 50

* The assessment of the environmental liabilities has been limited to a 30-year period in accordance with Article 10 of the Council Directive 1999/31/EC of 26 April 1999 on the Landfill of Waste, as set out in the Agency's guidance document.

Table 10: Risk Classification - Severity

Rating	Category	Description	Cost of Remediation
1	Trivial	No damage or negligible change to the environment.	*
2	Minor	Minor impact/localised or nuisance	*
3	Moderate	Moderate damage to environment	*
4	Major	Severe damage to local environment	*
5	Massive	Massive damage to a large area, irreversible in medium term	*

* It should be noted that in addition to the costs associated with remediation, there may be some scenarios where the level of environmental damage is low or even minimal, but there would be costs associated with restoring the site; for example, in the event of a release of the contents from an acid or caustic storage tank into the bund, there would be little or no environmental damage but there would be a cost associated with the removal of the material from the bund and its disposal off site. As such, we have based the Severity Rating only on the level of environmental damage that could arise following an accident scenario, not on the costs associated with this scenario.

6 HAZARD IDENTIFICATION

6.1 Introduction

Environmental liabilities may arise from anticipated events such as known and quantifiable releases to the environment that occur as part of the routine operation of the site. However, as part of the IPPC licensing process, routine emissions from Bulmers have been analysed and quantified and have been subjected to environmental impact assessment. This process ensures that no significant environmental impact will occur from releases from the site due to routine operations.

Therefore, for the Annerville site, the only means by which environmental liabilities may arise are from unanticipated events outside of routine operation.

6.2 Summary of Identified Environmental Hazards

In identifying the environmental hazards at the site, we have divided the operations and activities into the following broad categories:

1. Delivery of bulk and packaged liquids
2. Storage of bulk and packaged liquids
3. Distribution via pipelines
4. Distribution via containers
5. Releases from production vessels
6. Waste water treatment plant
7. Fires and firewater
8. Releases to Atmosphere

A total of forty-one hazards were identified and likelihood and consequence ratings were assigned to each using the classification in Tables 9 and 10, yielding overall risk ratings for each hazard. The risk assessments are summarised in Table 11. More detailed descriptions of the hazards and risks associated with each of the categories are provided in sub-sections 6.4.1 to 6.4.6.

6.3 Catastrophic Tank Failure

Catastrophic failure of a tank (where the tank fails, releasing its entire contents instantaneously) is an extremely rare event. The Health and Safety Executive in the UK and the Advisory Council on Dangerous Substances in the Netherlands have developed estimates for the likelihood of failure of single tanks, both of which are in the order of once in 200,000 years. Thus, catastrophic failure of a single storage tank is not considered to be a credible scenario in the context of the period covered by this ELRA. However, as the lowest likelihood rating of Very Low in the EPA's guidance covers the range from 0% to 5% chance of occurrence, this scenario has been included in the risk assessment for completeness.

Where more than one tank is present (as is the case in the product tank farm at the Annerville site), the likelihood of catastrophic tank failure increases accordingly. However, even for a tank farm containing 545 tanks, the likelihood of catastrophic tank failure is still considered to be very low in the context of the period covered by this ELRA (thirty years), at once in 370 years.

Table 11: Identified Environmental Hazards

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
1.	**Delivery of Bulk and Packaged Liquids**							
1.1	New Manufacturing Unit chemical storage area	Overfilling of caustic / citric acid tank with spill into bund during delivery.	Potential for release of caustic / citric acid to bund. Minimal effect if the released material is retained within the bund.	1	Cost of clean up and disposal of released material.	2	Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	2
1.2	New Manufacturing Unit chemical storage area	Leak/spill of caustic / citric acid during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away).	Potential for release of caustic / citric acid to the bund or surrounding hardstanding area. Minimal effect if the released material is retained within the bund. Spills outside the bund drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	3	Unloading of road tankers is a manned operation carried out by trained drivers. Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	3
1.3	Caustic concentrate bund	Overfilling of tank with spill into bund during delivery.	Potential for release of caustic liquor to bund. Minimal effect if the released material is retained within the bund.	1	Cost of clean up and disposal of released material.	2	Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	2

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
1.4	Caustic concentrate bund	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away).	Potential for release of caustic liquor to bund or surrounding hardstanding area. Minimal effect if the released material is retained within the bund. Spills outside the bund drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	3	Unloading of road tankers is a manned operation carried out by trained drivers. Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	3
1.5	Chemical storage area	Release of chemical from IBC, drum or pallet of containers (e.g. puncture, dropping of IBC / drum) during delivery.	Potential for up to 1 m^3 to be released. Minimal effect if the released material is retained within a contained area (fixed or portable bund). Spills outside the contained area drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	3	Unloading and transport of chemical containers is carried out by trained personnel in accordance with a written procedure. Containers are designed to the appropriate UN standard to resist releases from accidental impacts.	3
1.6	Citric acid tank	Overfilling of tank with spill into bund during delivery.	Potential for release of citric acid to the bund. Minimal effect if the released material is retained within the bund.	1	Cost of clean up and disposal of released material.	2	Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	2

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
1.7	Citric acid tank	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away).	Potential for release of citric acid to bund or surrounding hardstanding area. Minimal effect if the released material is retained within the bund. Spills outside the bund drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	3	Unloading of road tankers is a manned operation carried out by trained drivers. Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	3
1.8	Grants spirit tank	Overfilling of tank with spill into bund during delivery.	Potential for spirit to be released to the bund. Minimal effect if the released material is retained within the bund.	1	Cost of clean up and disposal of released material.	2	Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	2
1.9	Grants spirit tank	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away).	Potential for release of spirit to the bund or surrounding hardstanding area. Minimal effect if the released material is retained within the bund. Spills outside the bund drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	3	Unloading of road tankers is a manned operation carried out by trained drivers. Filling of storage tanks is a manned operation and is carried out in accordance with the site's Spill Prevention and Response Procedure.	3

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
1.10	Grants chemical store	Release of chemical from IBC, drum or pallet of containers (e.g. puncture, dropping of IBC / drum) during delivery.	Potential for up to 1 m^3 to be released. Minimal effect if the released material is retained within the bunded area. Spills outside the bunded area drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	3	Unloading and transport of chemical containers is carried out by trained personnel in accordance with a written procedure. Containers are designed to the appropriate UN standard to resist releases from accidental impacts.	3
1.11	Lubricating oil store	Release of lubricating oil from 200 litre drum (e.g. puncture, dropping of drum) during delivery.	Potential for up to 200 litres to be released. Minimal effect if the oil is retained within the bund. Its mobility outside the bunded area is limited due to its viscosity and is retained on a hardstanding area.	1	Cost of clean up of residual material from spill.	3	Unloading and transport of oil containers is carried out by trained personnel in accordance with a written procedure. Containers are designed to the appropriate UN standard to resist releases from accidental impacts.	3

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
1.12	Site-wide	Leak from truck fuel tank (delivery or distribution vehicles)	Potential for up to 500 litres of diesel to be released to hardstanding areas and ultimately draining to the WWTP or attenuation ponds (depending upon spill location) if not cleaned up in-situ. Potential for fuel spill at perimeter of hardstanding areas to migrate to unprotected areas and percolate into the soil / ground.	2	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	4	A large volume of vehicles deliver to, distribute from and operate at the site.	8
1.13	Finished Product Warehouse	Damage to packaged goods during collection / dispatch from the site.	Potential for up to 1,000 litres of finished product to be released. Spilled material ultimately drains to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material from spill. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	4	Regular movement of finished goods by forklift truck and onto trucks for transport off site.	4

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
2.	**Storage of Bulk and Packaged Liquids**							
2.1	New Manufacturing Unit chemical storage tanks	Loss of containment from caustic or citric acid tank into bund (catastrophic tank failure or leak from a failed tank fitting).	Full contents of the tank released with up to 12.5 m^3 overtopping the bund wall to the surrounding hardstanding. Minimal effect from material retained in bund, while overtopped material drains to the WWTP.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Storage tanks are subject to inspection and maintenance. Catastrophic tank failure or failure of a tank fitting is considered very low.	1
2.2	Caustic concentrate tank	Loss of containment from tank to bund (catastrophic tank failure or leak from a failed tank fitting).	Full contents of the tank released with up to 24 m^3 overtopping the bund wall to the surrounding hardstanding. Minimal effect from material retained in bund, while overtopped material drains to the WWTP.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Storage tanks are subject to inspection and maintenance. Catastrophic tank failure or failure of a tank fitting is considered very low.	1

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
2.3	Chemical storage area	Loss of containment from IBC, drum or pallet of containers (catastrophic vessel failure or leak from a failed tank fitting).	Up to 1,000 litres of chemical released to the hardstanding, ultimately draining to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Containers (IBCs and drums) are designed for their intended purpose.	1
2.4	Citric acid tank	Loss of containment from tank to bund (catastrophic tank failure or leak from a failed tank fitting).	Full contents of the tank released with up to 34 m^3 overtopping the bund wall to the surrounding hardstanding. Minimal effect from material retained in bund, while overtopped material drains to the WWTP.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Storage tanks are subject to inspection and maintenance. Catastrophic tank failure or failure of a tank fitting is considered very low.	1

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
2.5	Grants spirit tank	Loss of containment from tank to bund (catastrophic tank failure or leak from a failed tank fitting).	Full contents of the tank released with up to 65 m^3 overtopping the bund wall to the surrounding hardstanding. Minimal effect from material retained in bund, while overtopped material drains to the WWTP.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Storage tanks are subject to inspection and maintenance. Catastrophic tank failure or failure of a tank fitting is considered very low.	1
2.6	Grants chemical store	Loss of containment from IBC, drum or pallet of containers (catastrophic vessel failure or leak from a failed tank fitting).	Up to 1,000 litres of chemical released to the hardstanding area, ultimately draining to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Containers (IBCs and drums) are designed for their intended purpose.	1

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
2.7	Lubricating oil store	Loss of containment from 200 litre drum (catastrophic failure).	Up to 200 litres of lubricating oil released to the hardstanding. Its mobility is limited due to its viscosity and is retained on an area of hardstanding.	1	Cost of clean up of residual spill material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Containers (IBCs and drums) are designed for their intended purpose.	1

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
3.	**Distribution via Pipelines**							
3.1	Product tank farm	Failure of inter-tank transfer hoses during transfer of product	Up to 45 m^3/hr of product released to the containment area or overspill to the surrounding hardstanding and drain to the WWTP if not cleaned up in-situ. Releases from tanks at perimeter may migrate to areas not covered in hardstanding.	2	Cost of clean up of residual material on hardstanding. Small potential for some percolation into soil at perimeter of hardstanding area. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Control flowmeter used when topping up tanks, batching unit has auto cut-off at defined volume and all transfers are monitored by operations personnel.	4

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
3.2	Product tank farm	Overfilling of tank	Potential for up to 45 m^3/hr of product to be released to the containment area or overspill to the surrounding hardstanding and drain to the WWTP if not cleaned up in-situ. Releases from tanks at perimeter may migrate to areas not covered in hardstanding.	2	Cost of clean up of residual material on hardstanding. Small potential for some percolation into soil at perimeter of hardstanding area. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Standardised tank sizes means that most tank-to-tank transfers are for tanks of equal volume. Control flowmeter used when topping up tanks, batching unit has auto cut-off at defined volume and all transfers are monitored by operations personnel.	4
3.3	Refrigeration System	Failure of glycol pipeline	Potential release of dilute glycol within production areas or to external hardstanding area, ultimately draining to WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Pipelines are designed to appropriate standard and for the intended purpose and convey non-corrosive material. Pipelines are protected from normal traffic moverments.	2

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
3.4	Refrigeration System	Failure of ammonia pipeline	Potential release of ammonia with subsequent evaporation and dispersion in atmosphere.	1	No cost incurred.	2	Pipelines are designed to appropriate standard and for the intended purpose. Pipelines are protected from normal traffic moverments.	2
3.5	CO_2 Recovery System	Failure of CO_2 pipeline	Potential release of CO_2 to atmosphere and subsequent dispersion.	1	No cost incurred.	2	Pipelines are designed to appropriate standard and for the intended purpose. Pipelines are protected from normal traffic moverments.	2

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
4.	**Distribution via Containers**							
4.1	New Manufacturing Unit chemical dosing area	Release of peracetic acid from IBC (e.g. puncture, dropping of IBC) during site transfer.	Potential for up to 1,000 litres of peracetic acid to be released to the hardstanding area and drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Transport of containers is carried out by trained personnel. Containers are designed to the appropriate UN standard to resist releases from accidental impacts.	2
4.2	CIP dosing area	Release of caustic from IBC (e.g. puncture, dropping of IBC) during site transfer.	Potential for up to 1,000 litres of caustic to be released to the hardstanding area and drain to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Transport of containers is carried out by trained personnel. Containers are designed to the appropriate UN standard to resist releases from accidental impacts.	2

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
4.3	Site wide	Failure of vessel (IBC, drum or container) containing chemical from impact during transport around the site.	Potential for up to 1,000 litres of chemical to be released to hardstanding and drain to the WWTP or attenuation ponds (depending on location of spill) if not cleaned up in-situ.	1	Cost of clean up of residual material on hardstanding. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Transport of containers is carried out by trained personnel. The containers are designed to minimise loss following impact.	2

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
5.	**Release from Production Vessel**							
5.1	Production Area	Overfilling of vessel	Potential release of up to 45 m^3/hr of product to the production area and process drain, ultimately draining to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material within production area. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	2	Vessels are fitted with level gauges and filling of vessels is carried out automatically with supervision by trained personnel.	2
5.2	Production Area	Loss of containment from vessel from catastrophic failure or failure of vessel fitting.	Potential release of product to the production area and process drain, ultimately draining to the WWTP if not cleaned up in-situ.	1	Cost of clean up of residual material within production area. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Production vessels are subject to inspection and maintenance. Catastrophic tank failure or failure of a tank fitting is considered very low.	1

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
5.3	Product tank farm	Loss of containment from tank from catastrophic failure or failure of a tank fitting.	Potential for up to 1,136 m^3 of product to be released to containment area or overspill to the surrounding hardstanding and drain to the WWTP. Releases from tanks at perimeter may migrate to areas not covered in hardstanding.	2	Cost of clean up of residual material on hardstanding. Small potential for some percolation into soil at perimeter of hardstanding area. The site drainage system, attenuation ponds and WWTP are considered part of the containment system for the site, preventing potentially damaging material from reaching the wider environment.	1	Storage tanks are subject to inspection and maintenance. Based upon the number of tanks (545) and the likelihood of catastrophic failure (once in 200,000 years), catastrophic tank failure is considered very low over the period covered by this assessment.	2

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
6.	**Waste Water Treatment Plant**							
6.1	Attenuation Ponds	Overfilling / overflow of attenuation pond(s)	Potential for contaminated surface water to overflow the pond(s) to the surrounding area.	2	In the worst case, there would be little or no dilution effect gained from the surface water in the pond(s) and the contaminant would overflow to the surrounding area.	1	The system is designed based upon a 100 year return period storm, the retention of firewater and the area of hardstanding to be drained. The overfilling of *contaminated* surface would require a combination of events: a spill / release, failure of the pond(s) / control system and a 100-year storm event or firewater discharge.	2

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
6.2	Attenuation Ponds	Accidental release from attenuation pond(s)	Potential release of contaminated surface water from attenuation ponds to River Suir.	2	In the worst case, there would be little or no dilution effect gained from the surface water in the pond(s) and the contaminant would discharge directly to the river.	1	The outfall from the ponds to the River Suir incorporates a TOC meter which diverts the flow to the WWTP upon detection of high levels. The accidental release of *contaminated* surface would require a combination of events: a spill / release and failure of the pond(s) / control system.	2
6.3	Wastewater / Balancing / Aeration / Divert Tanks	Overfilling of vessel	Potential for untreated or partially treated effluent or contaminated surface water to be released to the surrounding gravelled area and percolate into the soil.	2	The released material would percolate into the surrounding gravelled area and may slowly migrate towards the River Suir.	2	The operation of the WWTP is automated with intervention only by trained personnel. The plant has been designed with sufficient volume to accommodate the potential volumes of effluent from the plant and drainage areas.	4

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
6.4	Wastewater / Balancing / Aeration / Divert Tanks	Loss of containment from vessel from catastrophic failure or failure of vessel fitting.	Potential release of up to 4,800 m^3 of partially treated effluent or contaminated surface water to the surrounding area and ultimately to the River Suir, or up to 600 m^3 of untreated effluent.	3	The area to the south of the WWTP falls towards the River Suir and, while this area may provide some hold up, in the event of a large release some of the effluent could reach the river. The river would be monitored for signs of contamination, with any subsequent costs dependent upon the results.	1	Catastrophic tank failure or failure of a tank fitting is considered very low.	3
6.5	WWTP Chemical storage area	Release of chemical from drum (e.g. puncture, dropping) during delivery.	Potential for up to 200 litres to be released. Minimal effect if the released material is retained within the bunded store. Spills outside the contained area are held up in the gravel / unmade ground.	2	Cost of clean up of residual material from spill.	2	Unloading and transport of chemical containers is carried out by trained personnel in accordance with a written procedure. Containers are designed to appropriate standards to resist leaks from accidental impacts.	4

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
7.	**Fires and Firewater**							
7.1	Major fire within production or storage area	Release of firewater.	Potential generation of up to 8,000 m^3 of contaminated firewater which would be contained within the attenuation ponds for in-situ treatment or diversion to the WWTP. Potential for firewater generated at perimeter of hardstanding areas to percolate into soil / gravel.	2	The cost associated with in-situ treatment of contaminated firewater within the ponds and / or clean up in-situ on hardstanding areas.	1	There is a comprehensive fire protection system at the site, including a detection and alarm system, fire extinguishers, fire fighting water and a foam system, a sprinkler system and hose reels. The highest risk area for a fire to occur is in the Grants facility or bonded warehouse, which both contain high strength alcohol.	2
7.2	Major fire within production or storage area	Potential for release of smoke to atmosphere.	Release of smoke to the atmosphere and dispersion with no long term damage to the environment.	2	No direct cost incurred but potential nuisance from smoke.	1	There is a comprehensive fire protection system at the site, including a detection and alarm system, fire extinguishers, fire fighting water and a foam system, a sprinkler system and hose reels.	2

Table 11: Identified Environmental Hazards (cont/d)

	Process/ Area	Hazard	Environmental Effect	Severity Rating	Basis of Severity Rating	Occurrence Rating	Basis of Occurrence Rating	Risk Score
8.	**Releases to Atmosphere**							
8.1	CO_2 system	Accidental / unintended release from the CO_2 recovery system.	Release of CO_2 to atmosphere and subsequent dispersion.	1	No cost incurred. CO_2 is vented to atmosphere in normal operation.	2	The CO_2 system is subject to inspection and maintenance and pipelines are located away from normal traffic routes.	2
8.2	Refrigeration system.	Accidental / unintended release of ammonia.	Release of ammonia to atmosphere and subsequent dispersion.	1	No cost incurred.	2	The refrigeration system is subject to inspection and maintenance and the pipelines are located away from normal traffic routes.	2
8.3	WWTP	Accidental / unintended release of biogas without flaring	Release of biogas from the WWTP to atmosphere with subsequent dispersion.	1	No cost incurred.	2	Biogas is collected from the WWTP and is sent either to the boiler or waste gas burner (flare) as part of normal operations. This operation is subject to routine inspection, maintenance and monitoring.	2

6.4 Description of Environmental Hazards

The potential environmental hazards that could arise at the site, identified in Table 11, are described in more detail in the following subsections.

6.4.1 Storage and Delivery of Bulk and Packaged Liquids

As outlined in Section 2.4, a variety of bulk and packaged liquids are stored at the site in a combination of purpose built storage tanks (caustic, acetic acid, oil), 1,000 litre IBCs, 200 litre drums and 25 litre drums. Bulk materials are stored in dilute form and the more concentrated materials are stored in smaller containers, while all storage tanks are located in bunded areas. In addition, the drainage system diverts all surface water to either the WWTP or the attenuation ponds, providing an additional level of protection in the event of a release outside a bunded area.

In the event of a release of material from a storage tank or other container, the liquid would either be retained within the containment area, in which case the severity of the scenario is considered Trivial (1) as there would be little or no damage to the environment. In this case, the only response required would be the collection and removal of the released material from the containment area, potentially requiring the disposal of the material as hazardous waste. The costs associated with such an event would depend upon the type and quantity of material released. The occurrence rating for these scenarios is considered Very Low (1), in the case of failure of the tank or tank fitting, to Medium (3), in the case of damage to a container during delivery. Thus, the overall risk ratings are between 1 and 3. In accordance with the Agency's guidance document, scenarios with risk ratings of 2 or less are not assessed further as part of the ELRA.

Alternatively, if the material were to overspill to the surrounding hardstanding, or were to be released directly on to the hardstanding, it would ultimately drain to the WWTP or to one of the attenuation ponds, depending upon the location of the spill. In the event of draining to an attenuation pond, one of two events could occur:

- Bulmers personnel and/or the automatic TOC meter at the outlet from the attenuation ponds would detect the release and divert the outflow from the pond to the WWTP, in which case the material would not be released offsite and the severity would be considered Trivial (1).
- If the release were too small to be detected by the TOC meter, it would therefore be considered sufficiently dilute to be released to the outfall to the river and the impact on the environment would also be considered Trivial (1).

While the majority of potential releases from tanks and containers would occur on areas of hardstanding that drain either directly or indirectly to the WWTP, there are a number of areas of the site where, if a release were to occur, the material could percolate into the soil. However, these areas are remote from the main production and storage areas of the site and therefore the likelihood of such events occurring is considered Very Low (1). Even if such a release were to occur, the size of the spill would be unlikely to give rise to more than a Minor Impact / Localised or Nuisance (2).

The number of vehicles accessing the site, in particular heavy goods vehicles, means that there is a potential for diesel oil spills from leaking fuel tanks. While the potential quantity of material that could be spilled is relatively small (less than 500 litres), such a spill could occur at any location around the site and therefore the potential for the material to reach an area not covered by hardstanding and therefore not be contained within the site's drainage system increases, yielding a severity rating of Minor (2), with an occurrence rating of High (4) based upon the frequency of vehicular traffic activity at the site. The overall risk rating for this scenario is 8.

6.4.2 Transfer of Materials

The raw materials, finished and intermediate products and dosing / cleaning chemicals used at the site are transferred by pipeline or in containers with capacities of up to 1,000 m^3.

The release of material during transfer by pipeline may occur due to a failure of the pipeline or a pipeline connection or from overfilling of vessels or containers. The likelihood of such an event arising is considered to be Low (2), with a severity rating of Minor (2), as the release could occur at any location throughout the site, although it is likely that it would be contained within the site's drainage system. The overall risk rating for this scenario is 4.

Packaged chemicals are transported throughout the site from the storage areas to their point of use in containers with capacities up to 1,000 m^3. The nature of these materials, as outlined in Section 2.4, is unlikely to cause significant damage to the environment given the size of the containers and the locations at the site where such releases could occur. However, as a release could occur at any location at the site, this scenario has been assigned a severity rating of Minor (2). The likelihood of a release occurring from a damaged container is considered to be Low (2), yielding an overall risk rating of 4.

6.4.3 Releases from Production Vessels and Product Tanks

Products for final blending prior to packaging are held in stainless steel vessels within the production buildings. The floor drains in these buildings are connected to the process drainage system and therefore, in the event of a leak, overfill or other release from a vessel, the materials would be sent to the site's WWTP before being discharged to the municipal WWTP. The potential for released material to result in environmental damage is therefore considered to be Trivial (1) with an occurrence rating for the most likely scenario considered to be Low (2). Therefore, the overall risk score for the highest risk scenario from the production vessels is 2.

The product tanks at the site are located within a bunded area and therefore, in the event of a leak (e.g. from a failed tank fitting), overfilling or other release from the tank, the material would be contained within the bunded area. The severity for this type of scenario is considered Trivial (1), with a likelihood of Low (2), giving an overall risk rating of 2. However, in the event of a catastrophic failure of a product tank, the released material could overtop the bund wall and, given the layout of the tank farm, could flow towards unmade ground and percolate into the soil. In this case the severity is considered to be Minor (2), but the likelihood is reduced to Very Low (1). Therefore, the overall risk rating is also a 2.

6.4.4 Wastewater Treatment Plant

All effluent from the site is sent to the on-site WWTP for treatment prior to discharge to the municipal WWTP, while all surface water run off is collected in the site's drainage system and sent either directly to the WWTP or to one of the two attenuation ponds where it is either discharged to the River Suir or diverted to the WWTP for treatment (in the event of contamination).

There are a number of scenarios that have been identified that could result in untreated or partially treated effluent, or contaminated surface water, being released from either the WWTP or attenuation ponds.

In the case of contaminated surface water from the site entering the attenuation ponds, following a spill or other release of material, there are controls in place to prevent the ponds discharging directly to the river, with the outlet valves closing automatically. However, in the event of a failure in the control system, such contaminated surface water within the ponds could be released directly to the river. This scenario is considered to have a Minor (2) impact on the environment and the likelihood of it occurring is considered Very Low (1), as it would require a combination of both a release and failure of a control system. Therefore, the overall risk rating for this scenario is 2.

The scenario that could give rise to the largest of all releases at the site is catastrophic failure of the 4,800 m^3 wastewater balance tank. The likelihood of this occurring is considered to be Very Low (1), as discussed in more detail in Section 6.3. However, in the unlikely event that it did occur, the released material could overflow to the surrounding area and percolate into the soil. This material would then migrate towards the River Suir and, while it would be diluted and degrade over time, there is the potential for some relatively high COD material to enter the river. In addition, it is likely that some released material would enter the river directly, albeit a very small quantity. In the worst case, the severity rating for this scenario is considered to be Moderate (3), resulting in an overall risk rating of 3.

6.4.5 Fire and Firewater

A major fire at the site may result in the release of significant quantities of smoke to atmosphere. While the immediate consequence of such a scenario would be pollution of the air in the vicinity of the site, there would be no long term damage to the environment and therefore no requirement for remediation or clean up activities. The overall risk rating for this scenario is 2, based upon a Very Low occurrence rating (1) and a Minor severity rating (2). Consequently, this scenario is not assessed further.

The firewater associated with a major fire at the site would be collected in the site's surface water drainage system and sent to one of the two attenuation ponds for containment. The attenuation ponds have sufficient capacity to retain the largest quantity of firewater likely to arise at the site combined with the rainfall from a 20-year storm event over 24 hours. Therefore, all the firewater generated at the site would be contained and there would be no threat to the environment. The severity rating for this scenario is considered to be Minor (2), based upon the volume of firewater that could be generated, while the likelihood rating is considered to be Very Low (1). The overall risk rating is therefore 2 and this scenario is not assessed further.

6.4.6 Releases to Atmosphere

A fault with the refrigeration, CO_2 or biogas systems could result in a release of ammonia, CO_2 or biogas to the atmosphere. A release of ammonia, CO_2 or biogas would disperse in the atmosphere and would be very short term. As a result, the severity of such releases is considered to be Trivial (1) while the frequency of such releases is considered Low (2), giving an overall risk rating for these scenarios of 2.

7 ASSESSMENT OF RISKS

7.1 Risk Register and Risk Matrix

Table 12 contains the risk register for the Annerville site, in which the risks with ratings higher than 2 are summarised. The risks are ranked by risk rating. The risk associated with each hazard is also shown in the risk matrix in Table 13.

All of the forty-one environmental hazards identified at the site are considered to be Low Risks, as shown in the summary matrix in Table 13. The impact of the scenario with the highest risk rating – a risk rating of 8 in this case – is discussed in more detail in Section 7.2. All other scenarios at the Annerville site have a risk rating less than or equal to 4.

Table 12: Risk Register (scenarios sorted by Risk Rating)

ID	Description	Severity Rating	Occurrence Rating	Risk Score
1.12	Leak from truck fuel tank (delivery or distribution vehicles)	2	4	8
1.13	Damage to packaged goods during collection / dispatch from the site.	1	4	4
3.1	Failure of inter-tank transfer hoses during transfer of product	2	2	4
3.2	Overfilling of product storage tank	2	2	4
6.3	Overfilling of wastewater storage vessel	2	2	4
6.5	Release of chemical from drum (e.g. puncture, dropping) during delivery at the WWTP.	2	2	4
1.10	Release of chemical from IBC, drum or pallet of containers (e.g. puncture, dropping of IBC / drum) during delivery at the Grants chemical store.	1	3	3
1.11	Release of lubricating oil from 200 litre drum (e.g. puncture, dropping of drum) during delivery.	1	3	3
1.2	Leak/spill of caustic / citric acid during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away) at the New Manufacturing Unit chemical store.	1	3	3
1.4	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away).	1	3	3
1.5	Release of chemical from IBC, drum or pallet of containers (e.g. puncture, dropping of IBC / drum) during delivery.	1	3	3

Table 12: Risk Register (scenarios sorted by Risk Rating) (cont/d)

ID	Description	Severity Rating	Occurrence Rating	Risk Score
1.7	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away) at the citric acid tank.	1	3	3
1.9	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away) at the Grants spirit tank.	1	3	3
6.4	Loss of containment from a WWTP vessel from catastrophic failure or failure of vessel fitting.	3	1	3

Table 13: Risk Matrix

OCCURRENCE	**V. High**	**5**	0	0	0	0	0
	High	**4**	1	1	0	0	0
	Medium	**3**	7	0	0	0	0
	Low	**2**	14	4	0	0	0
	V. Low	**1**	8	5	1	0	0
			1	**2**	**3**	**4**	**5**
			Trivial	**Minor**	**Moderate**	**Major**	**Massive**
			SEVERITY				

7.2 High Risk Scenarios

The incident scenario with the highest risk rating (8) is a fuel spill from a vehicle in any area of the site. While the severity rating for this scenario is Minor (2) given the low volume of material that could be expected to be released and the likelihood of the material to be contained within the site's drainage system, the frequency and nature of the vehicular activity at the site yields an occurrence rating of High (4).

In the event of a spill of fuel, the site's Spill Response Procedure would be implemented and spill kits would be deployed to contain the spill. The spilt material and any absorbent material would be collected and disposed of as hazardous waste. Where necessary, a specialist firm would be employed for this task.

Due to the nature of the hard standing areas at the site where such a spill could occur, it is not expected that the area of the spill would require remediation or further clean up measures, beyond the removal of the spilled material. However, if the spill were to occur at the perimeter of the hardstanding areas, further clean up may be required.

7.3 Risk Prevention / Mitigation

The scenarios that have been identified in this ELRA do not have the potential to give rise to significant environmental damage, primarily due to the drainage and containment system in place at the site, whereby both process effluent and surface water runoff is sent to either the WWTP or the attenuation ponds prior to final discharge to either the municipal WWTP or the River Suir. This drainage and containment arrangement was introduced at the site as part of the WWTP upgrade works between 2006 and 2008 and has significantly improved the protection offered to the environment.

In the event of a release occurring at the site, Bulmers has a number of Emergency Response Procedures in place, designed to minimise the impact on the environment of an accidental emission or spillage, together with an overall Emergency Response Procedure for the site. The individual procedures include:

- Storage and Stock Control of Spill Control Equipment
- Spill Prevention and Response
- Power Failure in the WWTP
- Fire
- Boilers and Emergency Response
- Security Response to Alarms in the WWTP

These procedures are supported by training programmes in emergency response.

The *Spill Prevention and Response Procedure* sets out the measures to avoid and respond to spills from tanker filling operations, tanker unloading operations, chemical handling, chemical storage, fuelling, maintenance operations, cleaning operations and the on-site collection of waste. Spill kits are located at key areas around the site and are maintained in accordance with the procedure for *Storage and Stock Control of Spill Control Equipment*.

8 RISK MANAGEMENT

The Bulmers Annerville site implements both an Environmental and a Health and Safety Management System to ISO 14001 and OHSAS 18001, respectively. The Environmental Management System includes the establishment and maintenance of the Environmental Management Programme for achieving the environmental objectives and targets for the site. The programme includes designating responsibility for achieving the objectives and targets and the means and timeframe by which they are to be achieved. The EMP is reviewed on an annual basis and in light of any significant changes in the scope of activities at the site.

The Environmental Manager monitors and measures the key characteristics of activities within the scope of the EMS that have the potential to result in significant environmental impacts.

In addition to the EMS and EMP, Bulmers has a number of Emergency Response Procedures in place which are designed to minimise the impact on the environmental of an accidental emission or spillage (as set out in Section 7.3).

9 QUANTIFICATION OF UNKNOWN ENVIRONMENTAL LIABILITIES

In order to identify an indicative level of environmental liability associated with the environmental risks, a cost model has been used to generate the expected cumulative cost of the risks.

The only scenarios identified in this ELRA incurring a cost are those associated with the accidental release of material not contained within a bunded area or the site's overall containment system (the effluent and surface water drainage systems, WWTP and attenuation ponds). Of the fourteen scenarios assigned risk ratings greater than 2, only four would incur environmental clean up / response costs (refer to the note for Table 10, Section 5). These scenarios are:

- A spill of fuel from a vehicle at any location within the site.
- Overfilling of a vessel in the WWTP.
- Release of a chemical from an IBC or drum during delivery at the WWTP.
- A large scale loss from a vessel in the WWTP.

Cost ranges are provided for dealing with these scenarios. The cost model for environmental liability is based upon the median probability and severity of occurrence of each risk. The overall potential environmental liability for the site is summarised in Table 14.

The costs associated with removing spilled material not contained within bunded areas are based on typical costs for the removal and cleaning up of industrial spillages and include:

- mobilisation a spill response team;
- mobilisation of a tanker for the removal of the spilled material where applicable;
- removal of all spilled liquid;
- provision of a hot water washer to clean the spillage area where applicable, and removal of any contaminated wash water;
- removal of waste material off site for disposal as hazardous waste, as necessary.

In relation to a potential release of partially treated or untreated effluent to groundwater and the River Suir, there would be no direct clean up cost as the material released would readily disperse within the river. The costs attributed to this scenario relate to monitoring of groundwater and river quality following a release and, where the monitoring indicates residual damage, additional costs for specific restoration projects.

Table 14: Calculation of Potential Environmental Liability

Risk ID	Description	Occurrence Rating	Likelihood Range	Severity Rating	Cost Range	Median Probability	Median Cost	Most Likely Cost	Upper Cost
1.12	Leak from truck fuel tank (delivery or distribution vehicles)	4	20 – 50%	2	€3,500 - €7,000	35%	€5,250	€1,838	€2,450
1.13	Damage to packaged goods during collection / dispatch from the site.	4	20 – 50%	1	-[1]	35%	-	-	-
3.1	Failure of inter-tank transfer hoses during transfer of product	2	5 – 10%	2	-[1]	7.5%	-	-	-
3.2	Overfilling of product storage tank	2	5 – 10%	2	-[1]	7.5%	-	-	-
6.3	Overfilling of wastewater storage vessel	2	5 – 10%	2	€4,000 - €8,000	7.5%	€6,000	€450	€600
6.5	Release of chemical from drum (e.g. puncture, dropping) during delivery at the WWTP.	2	5 – 10%	2	€4,000 - €8,000	7.5%	€6,000	€450	€600
1.10	Release of chemical from IBC, drum or pallet of containers (e.g. puncture, dropping of IBC / drum) during delivery at the Grants chemical store.	3	10 – 20%	1	-[1]	15%	-	-	-
1.11	Release of lubricating oil from 200 litre drum (e.g. puncture, dropping of drum) during delivery.	3	10 – 20%	1	-[1]	15%	-	-	-
1.2	Leak/spill of caustic / citric acid during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away) at the New Manufacturing Unit chemical store.	3	10 – 20%	1	-[1]	15%	-	-	-
1.4	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away).	3	10 – 20%	1	-[1]	15%	-	-	-
1.5	Release of chemical from IBC, drum or pallet of containers (e.g. puncture, dropping of IBC / drum) during delivery.	3	10 – 20%	1	-[1]	15%	-	-	-
1.7	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away) at the citric acid tank.	3	10 – 20%	1	-[1]	15%	-	-	-

Table 14: Calculation of Potential Environmental Liability (cont/d)

Risk ID	Description	Occurrence Rating	Likelihood Range	Severity Rating	Cost Range	Median Probability	Median Cost	Most Likely Cost	Upper Cost
1.9	Leak/spill during unloading from road tanker (e.g. due to damaged or incorrectly fitted hose or tanker drive-away) at the Grants spirit tank.	3	10 – 20%	1	-[1]	15%	-	-	-
6.4	Loss of containment from a WWTP vessel from catastrophic failure or failure of vessel fitting.	1	0 – 5%	3	€100,000 - €500,000	2.5%	€300,000	€7,500	€12,500
						Total		**€10,238**	**€16,150**

[1] There is no environmental cost associated with this scenario as the release is contained within the site's overall containment system.

10 FINANCIAL PROVISIONS

The amount of financial provision that should be provided for a facility is determined using the results of a CRAMP (Closure Restoration Aftercare Management Planning) and an Environmental Liability Risk Assessment (ELRA). The purpose of the CRAMP is to identify the known liabilities and the ELRA to identify the unknown liabilities arising from the operations at a site. The liabilities may be summarised as follows:

Known Liability – Closure: The CRAMP sets out the liabilities that will arise upon closure of the facility (e.g. costs for site decommissioning and residual waste disposal). These costs were estimated at €383,513 in the Residuals Management Plan for the Annerville site, ref. Byrne Ó Cléirigh report 382-X008 dated July 2009. Bulmers has not specifically made financial provisions for the costs associated with the closure of the site. Bulmers is part of the C&C Group whose internal resources are more than sufficient to cover the costs associated with clean closure of the Annerville site. The cost of implementing the Closure Plan will be underwritten by the C&C Group within the overall cost of the closure project, which will be set up by Bulmers in the event of closure of the Annerville site.

Known Liability – Restoration and Aftercare Management: Where appropriate, the CRAMP also sets out the liabilities that will arise as part of the restoration and aftercare management once a site is closed (e.g. soil and groundwater remediation programme, long term environmental monitoring). As set out in the Residuals Management Plan for the site, the only significant aftercare cost for the Anneville site would be the cost of groundwater and production well monitoring and site security, and this cost would be covered also within the overall cost for the closure project.

Unknown Liability – Accidental Releases: The ELRA identifies the accident scenarios that could occur during the operational life of the facility that could give rise to an environmental liability. The Agency's guidance document recommends that the appropriate financial provision for the unknown liabilities identified in the ELRA is to use risk-transfer instruments to reflect the uncertainty of the risk occurrence and availability of funds, e.g. bonds, insurance or letters of credit.

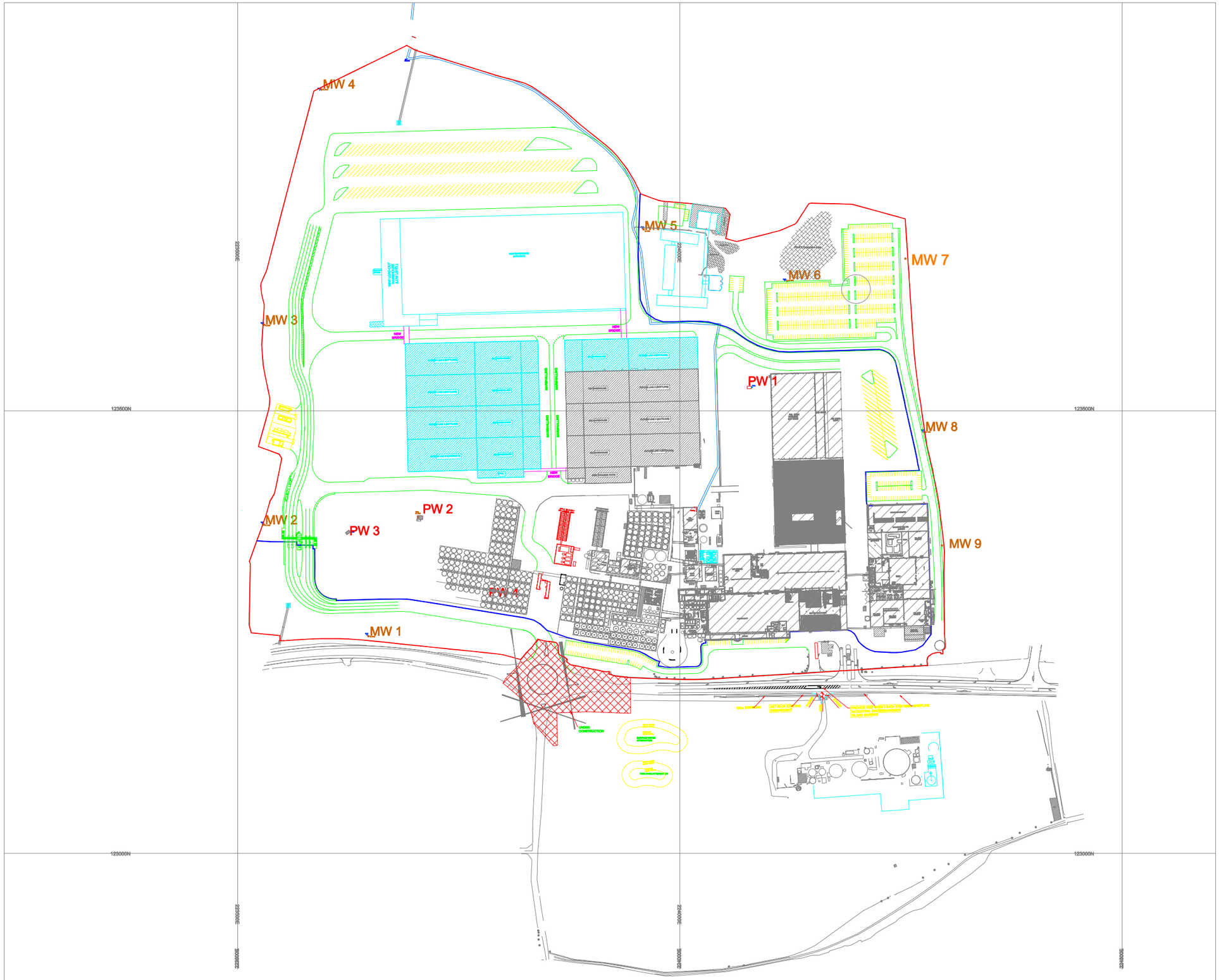
In this Environmental Liabilities Risk Assessment, the upper financial cost of the unknown liabilities from Bulmers's operations is estimated at €16,150 over a 30-year period. The worst case single incident is estimated to cost up to €500,000 with a likelihood of occurrence of 2.5% over a 30-year operational period.

Bulmers holds Public Liability Insurance which covers sudden identifiable unintended and unexpected incidents. This cover may include the liabilities arising from the incident scenarios assessed in this ELRA and Bulmers should check this with their insurers.

11 REVIEW OF ELRA

The Environmental Liabilities Risk Assessment will be reviewed annually in light of any developments at the site that may have occurred during the previous year and amended as required. Any new accident scenarios identified will be added to the ELRA and the severity and occurrence ratings for the existing scenarios will be reviewed in light of any new measures introduced. The costs associated with the accident scenarios will be updated as appropriate and the financial provisions will be maintained accordingly.

APPENDIX 1 : SITE PLAN OF BULMERS ANNERVILLE



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Client: Bulmers Irl Ltd

Project: Annervill Ground Water Level Monitoring Network

Title: Location of Ground Water Monitoring Wells

Figure No. 1

Date: November 2007

Scale: 1:1,750

Author: D Broderick

Checked by: S. O' Neill

N

Bulmers Annerville

RESIDUALS MANAGEMENT PLAN

(Prepared in the Context of Condition 10 of IPPC Licence
Register No. P0443-02)

Document No.: 382-X008
FBS: 07.01.11
Date: July 2009

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This report has been prepared by Byrne Ó Cléirigh Limited with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporating our Terms and Conditions and taking account of the resources devoted to it by agreement with the Client.

We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above.

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1 INTRODUCTION

In June 1998 Bulmers (trading as Showerings (Ireland) Limited and Grants of Ireland) applied to the Environmental Protection Agency for an IPC licence for its site at Annerville, Clonmel. In March 2001 the Agency granted a licence, register number P0443-01, under Class 7.3 *commercial brewing and distilling, and malting in installations where the production capacity exceeds 100,000 tonnes per year*.

In May 2006 Bulmers applied to the Agency for a licence review for the Annerville site in order to take into account a variety of changes and expansion at the site, including a new bottling line, additional warehousing, additional maturation and fermentation tanks, new fermentation plant, new apple crushing presses and an upgrade to the wastewater treatment plant.

The Agency granted the revised licence, P0443-02, in December 2006 under:

Class 7.3.1: *cider and perry production in installations where the production capacity exceeds 25 million litres per year, not included in paragraph 7.8*, and

Class 7.8: *processes for the purposes of production of food products from vegetable raw materials with a finished product production capacity greater than 300 tonnes per day*.

Condition 10 of this licence (Decommissioning and Residuals Management) states:

> *Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution. The licensee shall carry out such tests, investigation or submit certification, as requested by the Agency, to confirm that there is no risk to the environment.*

While there is no requirement within the licence to prepare a Residuals Management Plan in advance of any termination or planned cessation of activity on the site, Byrne Ó Cléirigh was requested to prepare such a plan on behalf of Bulmers Annerville in the context of Condition 10 of the licence, above, and the Agency's circular letter to licenced sites dated 27th August 2008 regarding Environmental Liability Risk Assessment (ELRA), Residuals Management Plans (RMP), Closure Remediation and Aftercare Plans (CRAMP) and Financial Provision (FP).

The plan has been prepared in accordance with the Agency's guidance document *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)* and includes:

- a scope statement for the plan;
- the criteria which define the successful decommissioning of the activity or part thereof, which ensures minimum impact to the environment;
- a programme to achieve the stated criteria;
- details of the costings for the plan and a statement as to how these costs will be underwritten.

The closure scenario covered by the Plan is a permanent cessation of production on the site, clean closure of the facility and the sale of the site and buildings for redevelopment.

The term *Decommissioning and Residuals Management* is used in the licence. However, the Agency's guidance document refers to two plans, both of which may be required as part of the *Residuals Management Plan*, depending upon the risk category of a site. These two plans are a *Closure Plan* and a *Restoration and Aftercare Management Plan*. In order to distinguish between these two elements, we have adopted the terminology from the guidance document throughout this Residuals Management Plan.

2 SITE EVALUATION

2.1 Site Description

The Annerville site is located approximately 2 km to the east of Clonmel Town. The site covers an area of approximately 62 hectares on the northern side of the N24, consisting of the production, storage and administration areas, which covers approximately 10 hectares. There is an additional 4.5 hectare site immediately to the south of the N24 consisting of the wastewater treatment plant and associated facilities. This area also includes the two attenuation ponds for surface water and some of the orchards owned by Bulmers.

The production, storage and administration areas on the main site consist primarily of hardstanding (roadways, bunded areas) and buildings, with the remaining 52 hectares comprising fields, some of the orchards owned by Bulmers, and Annerville House.

A site plan is provided in Appendix 1.

2.2 Site History

Bulmers acquired a greenfield site at Annerville, on the outskirts of Clonmel, in 1965 for the construction of a cider manufacturing facility. This was in addition to their existing facility at Dowd's Lane in the centre of Clonmel. Over time, many of the production operations moved from Dowd's Lane to the Annerville site and, currently, all of the company's juice fermentations, perry fermentations, bulk blending, bottling, canning and kegging operations are located at the Annerville site. In addition, seasonal apple crushing operations and cider maturation are carried out, while the site also incorporates some of the orchards owned by Bulmers.

In 2006, a major development was undertaken on the site, which included the following:

- Installation of a new bottling line;
- Provision of an additional warehousing and new hardstanding;
- Installation of new apple receiving pits and additional apple crushing presses;
- Expansion of the tank farm;
- Upgrading of the Wastewater Treatment Plant;
- Construction of a new fermentation plant;
- General site development, including the provision of a new car park, new internal roads and a new site entrance.

2.3 Site Environmental Sensitivity Evaluation

The available geological information from the Geological Survey of Ireland (GSI) indicates that bedrock beneath the site comprises Waulsortian Limestone. There are two limestone aquifers below the site: the Lower Carboniferous Waulsortian (WA) and Ballysteen (BA). The WA aquifer is classified as regionally important with good development potential, while the BA aquifer is classified as a locally important aquifer, moderately productive in only local zones. South Tipperary does not have a groundwater protection scheme and therefore an aquifer vulnerability map has not been competed. However, the GSI's interim vulnerability map categorises the vulnerability of the groundwater as high to low.

There are a total of eight groundwater abstraction wells available for use at the site, up to three of which may be in use at any one time. The GSI's groundwater public viewer indicates that abstraction wells in the vicinity of the Annerville site have a poor to moderate yield.

2.4 Current Site Activities

Currently, all of the company's production activities are carried out at the Annerville site. The Annerville site also incorporates some of the orchards owned by Bulmers. The main unit operations carried out at the site are:

- Apple intake and seasonal apple crushing
- Cider fermentation / maturation
- Perry fermentation
- Beverage make up
- Packaging (bottling, canning, kegging)
- Warehousing & Logistics

In addition to the Bulmers unit operations, Grants of Ireland, which is also located on the site, carries out the following unit operations:

- Spirits and liquor intake and storage
- Spirits and liquor make up
- Packaging (bottling, bag-in-box)

A range of services unit operations are also carried out at the site to support the production activities. These service operations include:

- Water supply, treatment, and distribution
- Boilers
- Refrigeration
- Compressed air
- Cleaning-in-place (CIP)
- Carbon dioxide storage and distribution
- Effluent treatment (see below)

Between 2002 and 2004, the on-site wastewater treatment plant was upgraded significantly, with additional upgrade works taking place in 2006 which included the addition of an anaerobic pre-treatment plant. While the plant is capable of treating all the effluent from the site, the effluent from the WWTP is sent to the Clonmel Borough Council sewerage treatment works for final treatment before being discharged to the River Suir.

Part of the surface water collection system on the site is directed to the effluent drainage system and on to the effluent treatment plant. The remainder of the surface water is routed to two attenuation ponds on the site prior to discharge to the River Suir. There is a facility to divert the surface water from the attenuation ponds to the effluent treatment plant in the event of contamination of the surface water.

2.5 Emissions & Wastes

The following emissions to atmosphere and sewer, and hazardous and non-hazardous wastes, arise at the site:

- Boiler emissions to atmosphere;
- CO_2 emissions to atmosphere from the fermentation process;
- Emissions from the combustion of biogas in the boiler at the WWTP;
- Emissions from the flare stack from the anaerobic treatment process;
- Discharge of effluent from the production process (e.g. apple crushing, fermentation, bottle/can/keg washing, filtration, packaging operations and CIP operations), and a portion of the surface water run-off, to the Clonmel Borough Council sewerage system via the on-site WWTP;
- Discharge of surface water run-off to the River Suir;
- Disposal of non-hazardous wastes, including organic process waste, WWTP sludge, packaging waste and domestic / canteen waste;
- Disposal of small quantities of hazardous wastes associated with the service unit operations, including waste oils, fluorescent tubes, laboratory wastes, water treatment chemicals and CIP chemicals.

2.6 Hydrogeological Investigations

2.6.1 Potential Sources of Contamination

A number of investigations have been carried out at the Annerville site over the years to assess the groundwater, soils and geology underlying the site. In 2002, O'Neill Groundwater Engineering (OGE) carried out a hydrogeological investigation in accordance with Condition 9.3.3 of the original IPC licence. In 2006, OGE prepared the Soils, Geology and Hydrogeological sections of the Environmental Impact Statement for the expansion of the Annerville site[1]. This section of the EIS summarised the findings from the previous investigations and assessed the potential impacts from the proposed development.

A total of 5 potential sources of groundwater contamination were identified at the site:

- Factory Site
- Hydrocarbon Storage Tanks
- Landfill
- Septic Tanks
- Farm Chemical Applications

In the context of this Residuals Management Plan, these sources have the potential to result in long-term residual contamination at the site, potentially requiring restoration, remediation or aftercare management and, consequently, they are discussed in the following sections.

2.6.2 Factory Site

Prior to the expansion works carried out in 2006, all of the production areas at the site were located down gradient from the production wells on the site and therefore in the event of an accidental release scenario, the production wells would not become contaminated. In addition, OGE noted in the EIS that a 1993 survey report concluded that given the depth and nature of the overburden, it would be unlikely for any released effluent to enter the limestone aquifer.

Since the expansion works in 2006, the production areas of the site have expanded to the north and west and therefore the production wells are no longer up-gradient of all production areas. However, OGE noted that, as the production areas of the site are comprised of hardstanding and that any surface water or accidental releases would be directed into the drainage system, the risk to the aquifer is considered to be low.

[1] EIS for Proposed Extension of Manufacturing Facility at Annerville, Clonmel, Tipperary – Soils, Geology and Hydrogeology Section, O'Neill Ground Water Engineering, June 2006.

2.6.3 Hydrocarbon Storage Tanks

The oil storage tanks at the site are all bunded and therefore, in its assessment, OGE concluded that the risk to groundwater was low.

2.6.4 Landfill

There is a small disused landfill to the northwest of the site close to Annerville House. This landfill was established in the early 1990s to dispose of waste bottled drinks. The landfill is in an unlined excavated trench, approximately 30 m by 8 m, excavated to a depth of approximately 5 m. In a single dumping operation, a total of approximately 75 m^3 of waste drinks in 1 litre glass bottles and 1.5 litre plastic bottles were disposed of, together with the original glass and plastic packaging. The bottles were crushed during dumping. The landfill was subsequently backfilled and covered with overburden, resulting in a raised area several metres above the surrounding ground level.

In its assessment, OGE considered that, on the basis that the liquid contents of the landfill have drained away, the remaining content consists of the residual packaging material (glass, plastic and paper labels). OGE considers the waste material to be of low risk and notes that there has been no detectable impact from the landfill on the production wells. These wells are down-gradient of the landfill.

2.6.5 Septic Tanks

At the time the OGE report was written there were three septic tanks on the site serving both Annerville House (2 No.) and the production area (1 No.). One septic tank – the one located at the production area – has since been decommissioned. The effluent from the septic tanks is pumped to the site's WWTP for treatment and is not considered a risk to groundwater. The OGE reports states that there has been no indication of groundwater pollution from septic tank effluent over the history of the operation.

2.6.6 Farm Chemical Application

Three chemicals are applied in the orchards under guidance from Teagasc: fertiliser, fungicide and insecticide. Of the chemicals applied, it is considered that two do not degrade easily, with half lives of 10 and 175 days. However, it is considered that they would break down in the soil and therefore would not impact on the groundwater. OGE note that there have been no incidences of fungicide or insecticide in the groundwater and that nitrate levels from routine groundwater monitoring do not suggest an over application of fertiliser.

2.6.7 Groundwater Monitoring

There are eight production wells at the site that are monitored for a variety of parameters. These wells are monitored for a wide range of substances, including physicochemical, inorganic and metal parameters, as well as pesticides. While the monitoring of the production wells is carried out primarily to ensure that the water abstracted for use in the production process meets the required standard, the results are also a good indicator of groundwater quality from an environmental perspective.

In this regard, the only parameters that are routinely detected in concentrations above the EPA's Interim Guideline Values[2] are alkalinity / hardness and manganese. As outlined in Section 2.3, the available information from the GSI indicates that bedrock beneath the site comprises Waulsortian Limestone and that there are two limestone aquifers below the site. Thus, the high levels of alkalinity / hardness may be attributable to the natural background levels. Similarly, the EPA's *Parameters of Water Quality – Interpretation and Standards* states that manganese is found widely in soils and therefore the high levels detected within the production wells may also be attributable to natural background levels.

Overall, the groundwater monitoring programme at the site indicates that there has been no contamination of the soil or groundwater from site activities.

2.6.8 Potential Residual Contamination

While each of the sources discussed in Sections 2.6.has the potential to result in contamination of the soil and groundwater, the historical activities, lack of significant incidents from all but the landfill and the ongoing monitoring programme, indicate that only the landfill is likely to require aftercare management as part of this Residuals Management Plan. This is described in more detail in Sections 9 and 10.

2.7 Initial Screening & Operational Risk Assessment

The Agency's guidance document[3] provides for an initial step to determine the risk category for a site which, in turn, is used to determine the type and scope of the Plan. The three aspects of a facility that are used to classify it in terms of risk category are Complexity, Environmental Sensitivity and Compliance Record.

[2] Towards Setting Guideline Values for the Protection of Groundwater in Ireland, EPA
[3] Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)

2.7.1 Complexity

The Annerville site is licensed under two IPPC activities: a Class 7.3.1 activity and a Class 7.8 activity. Under the EPA's guidance, these activities are assigned the following Complexy Bands:

Table 1: Complexity Band

No.	Activity	Band
7.3.1	Brewing (including cider and perry production) in installations where the production capacity exceeds 25 million litres per year.	G3
7.8	(b) vegetable raw materials with a finished product production capacity greater than 300 tonnes per day (average value on a quarterly basis).	G2

The guidance states that where more than one scheduled activity is located at a facility, then the highest Complexity Band is applied, which is G3 in this case. This band corresponds to a Complexity Score of 3.

2.7.2 Environmental Sensitivity

In calculating the Environmental Sensitivity of the site, each of the six main environmental categories has been assessed, as summarised in Table 2 overleaf. The total Environmental Sensitivity score for the site is 10, corresponding to an Environmental Sensitivity classification of Moderate (2). This classification applies to a site with an Environmental Sensitivity score in the range 7 – 12.

Table 2: Environmental Sensitivity

Category		Environmental Attribute Score
Human Occupation[1]		3
Groundwater Protection	– Aquifer[2]	2
	– Vulnerability[3]	2
Sensitivity of Receiving Waters[4]	– Class	0
	– Coastal / Estuarine	0
Air Quality & Topography[5]		0
Protected Ecological Sites & Species[6]		1
Sensitive Agricultural Receptors[7]		2
Total		**10**

1) There are occupied buildings within 250 m of the Annerville site.
2) The GSI's National Bedrock Aquifer Map categorises the underlying bedrock as a regionally important aquifer.
3) The GSI's Interim Vulnerability Map categorises the vulnerability of the groundwater as high to low, noting that only an interim study took place. In calculating the Environmental Sensitivity of the site, we have adopted the conservative *high* vulnerability.
4) The site does not discharge to coastal or estuarine waters and is not within the catchment of EPA Surface Water Classification (1996).
5) The surrounding area is considered to be simple terrain as per the categories defined in the guidance document.
6) The site is less than 1 km from the River Suir, parts of which are designated as a candidate Special Area of Conservation, both upstream and downstream from Clonmel.
7) Agricultural activities take place immediately adjacent to the site.

2.7.3 Compliance Record

In 2008, Bulmers recorded 3 non-compliances in relation to licensed emissions and therefore, in accordance with the guidance document, the site would be considered to have a Compliance Record of Minor Non-Compliant, corresponding to a compliance score of 3.

2.7.4 Risk Category

The Risk Category for a site is determined by the product of:

$$Complexity \times Environmental\ Sensitivity \times Compliance\ Record$$

Applying the individual scores for Complexity, Environmental Sensitivity and Compliance yields an Overall Risk Score of 18, resulting in a Risk Category 2 (which has a range from 5 to 23). This is summarised in Table 3.

Table 3: Initial Risk Category for Bulmers Annerville

Parameter	Band / Rating	Score
Complexity	G3	3
Environmental Sensitivity	Moderate	2
Compliance Record	Minor Non Compliant	3
Overall Risk Score		*18*
Risk Category		**Category 2**

As the site is a Risk Category 2, it is required to prepare a Closure Plan. In addition, the Agency's guidance document requires Risk Category 2 sites that have long term issues, such as contaminated land, to prepare a Restoration and Aftercare Management Plan.

While there is a disused landfill at the site it is not likely to give rise to environmental pollution as discussed in Section 2.6.4. Given the nature of the activities on the site, the results on the environmental monitoring programme, the hydrogeological investigations and the closure scenario covered by this plan, Bulmers does not envisage the need to carry out restoration or remediation. Therefore, the Restoration and Aftercare Management will consist of passive aftercare requiring the monitoring of groundwater, in particular in the vicinity of the disused landfill.

In the event of an incident occurring that could give rise to the need for restoration or remediation, this plan will be amended accordingly. Similarly, if, during implementation of either the Closure Plan or the Restoration and Aftercare Management Plan it is considered that restoration or remediation may be required, this plan will be amended accordingly following discussion with the Agency.

3 CLOSURE CONSIDERATIONS

3.1 Close-Down Scenario

Bulmers intends to operate the Annerville site for the foreseeable future. However, for the purpose of this Closure Plan, three close-down scenarios have been considered.

- cessation of production and sale of the site and buildings for redevelopment;
- temporary cessation of production at the site for a period in excess of six months;
- sale of the site as a production facility.

We have prepared this Closure Plan on the basis of the first close-down scenario, namely cessation of production and sale of the site and buildings for redevelopment. Some or all of the measures required for this scenario would also be required for the other two scenarios.

Using the EPA's guidance, the site is classified as a Risk Category 2, and the need to provide for post-closure care of potentially polluting residuals is not foreseen. Therefore, clean closure of the site will be effected through implementation of the Closure Plan and will be demonstrated through the passive aftercare management (monitoring) as set out in the Aftercare Management Plan (Section 10).

3.2 Objectives & Scope

The Closure Plan has been prepared in the context of the site history and location, the site environmental sensitivity and the past and current operations on the site. The objectives of the plan are:

- to provide for the efficient close-down and decommissioning of the operations;
- to return unused raw materials and consumable materials to the original suppliers where practicable;
- to dispose of all waste materials in a safe and proper manner;
- to preserve and secure the buildings on site and any remaining services equipment during the post-closure period up to the disposal of the site;
- to provide for on-going monitoring during the passive aftercare phase and any monitoring that may subsequently be required;

- to document the close-down and decommissioning activities and the disposal of material and wastes.

The close-down and decommissioning activities will be carried out in a manner that will minimise the impact on the environment. The achievement of the objectives set out above and the fulfilment of the criteria set out in Section 4.1 will define the successful completion of the Closure Plan.

The scope of the Closure Plan covers the current operation at the site and relates primarily to the activities that could result in environmental pollution during the close-down and decommissioning phases.

In view of the close-down scenario on which the plan is based, it does not provide for the removal of the services on the site (piping, ducting, cabling, lighting, support structures) or the demolition of the buildings on the site.

3.3 Wind-Down of Production

In the event of a close-down scenario arising, the EPA and Clonmel Borough Council will be notified of the decision and provided with a timetable for the cessation of production activities. Production will be wound down in accordance with the timetable dictated by the business.

A team of Bulmers personnel will be set up to plan and implement the close-down and decommissioning activities.

3.4 Disposal of Plant, Equipment & Materials

3.4.1 Plant & Equipment

Using the asset list of the equipment on the site, the proposed method of disposal will be identified against each item of plant and equipment, namely:

- sale to a third party;
- sale for scrap;
- disposal as waste.

Prior to shipping items of plant and equipment off site they will be decommissioned as set out in Section 3.5.

The asset list will cover all plant and equipment at the site, including production, services, engineering, transport and office / administration equipment.

3.4.2 Production Materials

Stocks of production raw materials will be run down as production is scaled down on the site. Surplus production materials will be returned to the original suppliers or sold to other sites where practicable. Records of dispatch and notifications of receipt will be held for each returned/transferred consignment.

Production materials that cannot be returned to suppliers or sold to other sites will be sent for disposal / recovery as waste.

All finished product will be shipped to customers. In the case of surplus finished product, this will be sent for recovery / disposal as appropriate.

3.4.3 Non-Production Materials

The stocks of materials stored in bulk such as cleaning chemicals, CO_2, gas oil and LPG will be run down in advance of the closure of the site in order to minimise the quantities that have to be returned/vented/disposed of as waste. Unused non-production materials, including oils, cleaning materials, engineering and workshop materials and canteen and office supplies will be returned to the original suppliers where possible. Alternatively, these materials will be sold or sent for recovery / disposal. Records of dispatch and notifications of receipt will be held for each returned/transferred consignment.

3.5 Decommissioning & Cleaning of Plant & Equipment

3.5.1 Production Plant & Equipment

The production plant and equipment will be divided into the individual unit operations and a decommissioning checklist will be prepared for each unit operation. These checklists will contain the following items:

- list of plant and equipment items, and ancillary equipment;
- list of checks to be carried out (e.g. empty / drain, vent, clean, close off, isolate).

The items of plant and equipment used in the production unit operations will be identified and the specific steps required for decommissioning the items will be prepared.

The production plant and equipment will be emptied, cleared, drained, vented and isolated as required by the checklists. Since the cleaning of all the production equipment is a frequent and routine operation at Bulmers, the emptying and cleaning of this equipment in a close down scenario is not likely to generate additional waste for disposal off site.

Production materials will be recovered where practicable and removed offsite as outlined in Section 3.4.2 and 3.4.3. Non-recoverable production materials will be disposed of as per the conditions on waste management in the IPPC licence.

3.5.2 Services Plant & Equipment

A similar decommissioning exercise to that set out in Section 3.5.1 for the Production Plant and Equipment will be prepared for the Services Plant and Equipment. This equipment will be divided into the following operations:

- natural gas distribution
- gas oil storage and distribution
- LPG storage
- chemicals storage
- heating systems
- compressed air systems
- primary refrigeration
- secondary refrigeration (chilled water)
- water treatment
- cleaning-in-place (CIP)
- CO_2 intake, storage and supply effluent drainage
- Radioactive sources
- surface water drainage
- effluent drainage
- effluent treatment (WWTP)
- fire water storage and distribution
- fire fighting foam

As with the production plant and equipment, the services plant and equipment will be emptied, cleared, drained and vented as required by the checklists. All service materials will be removed by appropriate contractors and taken off site for recovery / reuse or disposal.

The natural gas supply to each consumer on site will be isolated once that consumer has shut down permanently, and the pipelines and burners will be vented. Branch pipelines in the gas distribution system will be spaded off where practicable as close as possible to the incoming supplies. The gas supply will be maintained to the hot water boiler providing space heating and hot water in the offices, as required during the period up to the sale and handover of the site.

The gas oil will be run down in the storage tanks and any residual gas oil will be transferred off site for recovery / disposal. The gas oil tank and piping will be cleaned and the waste disposed off as set out in Section 3.7.

The LPG storage vessels will be removed by the supplier.

All chemicals within the chemical storage areas, storage vessels and bunded areas will be run down as production is wound down. Surplus chemicals will be returned to the suppliers where practicable. Alternatively, surplus chemicals will be sent for recovery / disposal, together with waste chemicals arising during the wind down of production activities. Chemical holding vessels and distribution pipelines will be flushed through and drained.

The boilers and distribution system piping will be drained down to the sewer.

The compressed air storage and distribution system will be depressurised and vented to atmosphere.

The primary refrigeration system serving the production operation will be drained down of its contents (ammonia) and vented by a specialist contractor, and the refrigerant will be disposed off as set out in Section 3.7. The secondary refrigeration system (chilled water) will be drained down to sewer. The individual refrigeration units in the office building will be maintained as required during the close down of the site and during the aftercare management. Any refrigeration units to be disposed of as waste will be degassed by a specialist contractor.

The CO_2 system will be depressurised and vented to atmosphere.

All chemicals required for on site water treatment will be returned to the supplier or disposed of off site. The water treatment plant will be drained to the WWTP.

The CIP systems will be drained to the WWTP following final cleaning of the process equipment. Surplus CIP chemicals will be returned to the supplier or disposed of off site as set out in Section 3.7.

The three radioactive sources held on site under two licences from the Radiological Protection Institute of Ireland (RPII) and used in packaging operations by Bulmers (two sources) and Grants of Ireland (one source) will be returned to the supplier, Filtec Europe GmbH, in accordance with a returns policy implemented by that supplier and the conditions in the RPII licences.

The effluent sumps will be cleaned out and any residual sludge will be taken off site for disposal following all cleaning, dismantling and equipment removal activities, and the effluent drains will be flushed through with water to the WWTP.

The WWTP will be maintained throughout the closure and aftercare management phases of this plant to treat the remaining effluent from the close down operations and the diverted surface water. Upon final closure of the site, following completion of the aftercare management and demonstration of clean closure, the WWTP will be closed down. The plant will be drained and flushed through to the Council sewer. The biomass from the anaerobic plants will be removed and either sold or disposed of as waste off site. The chemical storage and addition systems at the WWTP will be drained down and cleaned as described above for the production plant. The residual materials in the WWTP, e.g. sludges, will be disposed of off site.

The fire water protection system consisting of the fire water tanks, hydrants, foam supplies and sprinkler system in the Grants building, will be maintained during the closure and aftercare management phases of this plan. If and when the requirement for the system ceases, the firewater will be drained down to the sewer. The foam supplies will be returned to the supplier or disposed of off site as waste.

3.6 Disposal of Plant & Equipment

The plant and equipment at the site will be disposed of in accordance with the following descending order of priority:

- sale to a third party;
- sale for scrap;
- disposal as waste.

All equipment will be cleaned prior to removal from the site in accordance with the process set out in Section 3.5.

Equipment containing lubricating oil, e.g. compressors, will be drained down if they are to be mothballed or disposed of as scrap. The waste oil will be disposed off of site.

A record of the disposal route for each item of plant and equipment will be maintained. The extent to which services plant and equipment, and piping, ducting, and electrical services etc., will be removed from the site will depend on the terms of the sale agreement in the close-down scenario under consideration.

3.7 Storage & Disposal of Waste Materials

All waste materials generated at the site during the close-down and decommissioning phases will be stored in designated areas of the site and bunded and protected against leaks or damage as appropriate. The waste will be disposed of from the site in accordance with the conditions of the licence and National and European Waste legislation in force at the time of the closure.

All waste collected from the site will be recorded, including the type, quantity and disposal route, in particular the final destination. No wastes will be disposed of on the site. Biodegradable waste sent for landspreading will be done so in accordance with the site's Nutrient Management Plan.

3.8 Site Buildings

As stated in Section 3.1, the close-down scenario covered by the plan does not envisage the demolition of the buildings on the site.

A number of buildings at the Annerville site have asbestos-containing materials, including the front office building which has sandwich panels fabricated from aluminium sheeting and asbestos board. Asbestos removal work has been carried out in other areas of the Annerville site, primarily asbestos cement roofing material. A register of asbestos-containing materials will be provided by Bulmers as part of the sales agreement for the site.

3.9 Landfill

Based on the description and assessment of the landfill in Section 2.6.4, Bulmers do not foresee the need to remove the landfill material (glass and plastic packaging) from the site in the context of residuals management as it is not likely to give rise to environmental pollution in the future. The future of the landfill would be addressed in any sales agreement for the site.

3.10 Compliance with Licence Conditions

Throughout the close-down and decommissioning phases, the site will be managed to maintain compliance with the conditions of the licence. Emissions monitoring will be maintained where appropriate.

The ground water monitoring programme will be maintained during the close down and the passive aftercare period and the results will be forwarded to the Agency. These results will form the basis of demonstrating successful clean closure of the site.

4 CRITERIA FOR SUCCESSFUL CLOSURE

Successful closure of the site will be achieved following:

- Implementation and completion of the Closure Plan, achieving clean closure, and
- Implementation and completion of the Aftercare Management Plan, demonstrating clean closure.

The Closure Plan has been prepared in the context of the site history, including the past and current activities carried out at the site, and its location. Successful closure of the site will have been achieved when it can be demonstrated that the closure plan has been fully implemented, as appropriate to the closure scenario. This will require that the following criteria were met:

- All production plant and equipment was safely decontaminated using standard procedures;
- All services plant and equipment were safely decontaminated using standard procedures;
- All wastes were handled, packaged, stored and disposed of / recovered in accordance with the appropriate conditions of the IPPC licence and the relevant waste legislation in force at the time of the closure;
- All records relating to the disposal / recovery of wastes were retained throughout the closure process, including, as appropriate, Consignment Notes (C1 forms) and Transfrontier Shipment of Waste (TFS) records for hazardous wastes, and certificates of disposal / recovery;
- All records relating to raw materials transferred off site for reuse were retained throughout the closure process;
- All records relating to the check lists used during the decommissioning of the production and services plant and equipment were retained throughout the closure process;
- All conditions of the IPPC licence were complied with during the closure process[4];
- The site's EHS Management System remained in place and was actively implemented during the closure period;
- All costs associated with the closure plan were discharged.

[4] Where monitoring required under the IPPC licence highlights groundwater or soil contamination, either prior to or during implementation of the Closure Plan, the Restoration and Aftercare Management Plan will be adapted to ensure clean closure is effected prior to disposal of the site by Bulmers, or in accordance with the terms of the sales agreement.

Following completion of the Closure Plan, the Aftercare Management Plan will be implemented at the site. This plan will consist of passive aftercare through continuation of the groundwater monitoring programme and the results will be used to demonstrate that groundwater concentrations of the parameters monitored, as agreed with the Agency, do not exceed the relevant limits or guidance values.

Finally, successful completion of the Residuals Management Plan will be achieved once the IPPC licence is surrendered to the Agency.

5 CLOSURE PLAN COSTING

The Closure Plan has been costed based upon the scenario set out in Section 3.1. The estimated costs (in 2009 prices) in achieving closure of the site are set out in Table 4.

Table 4: Costing for Closure Plan

Item	Description	Estimated Cost (€)
1	Close-down and decommissioning activities by site personnel and contract personnel	141,000
2	Decommissioning activities by specialist contractors, including waste disposal	151,200
3	Removal and disposal of plant [Note 1]	–
4	Demolition [Note 2]	–
5	Environmental consultancy (incl. Closure Audit, report to EPA and validation certification)	7,500
	Subtotal	*299,700*
6	Contingency (25%)	74,925
7	Surrender of IPPC licence [Note 3]	8,888
	Total Estimated Closure Cost	***€383,513***

Note 1 Removal and disposal of plant, where required, is considered cost neutral.
Note 2 No demolition work is envisaged as part of the Closure Plan.
Note 3 An application to surrender the site's IPPC may be submitted to the Agency following successful demonstration of clean closure of the site.

The costs set out in Table 4 are those required to achieve successful closure of the site, i.e. to achieve the criteria set out in Section 4.1. As stated in Section 3.2, the plan does not provide for the removal of the services on the site or the demolition of the buildings. In addition, the costs do not include for the transfer or sale of plant and equipment as these activities would be expected to be at least cost neutral.

Bulmers has not specifically made financial provisions for the costs associated with the closure of the site. Bulmers is part of the C&C Group whose internal resources are more than sufficient to cover the costs associated with clean closure of the Annerville site. The cost of implementing the Closure Plan will be underwritten by the C&C Group within the overall cost of the closure project, which will be set up by Bulmers in the event of closure of the Annerville site.

6 CLOSURE PLAN UPDATE & REVIEW

Bulmers will review the Closure Plan annually and amend it as required in light of any developments and / or incidents at the site that may have occurred since the previous review. Any proposed amendment to the Closure Plan will be submitted to the Agency as part of the Company's Annual Environmental Report.

7 CLOSURE PLAN IMPLEMENTATION

The projected timescale for implementing the Closure Plan under the selected close-down scenario is 6 months. This period would run from the announcement of the closure to the Agency to the start of the site aftercare management programme. The 6 months estimate is comprised of 3 months to the cessation of production and 3 months for the completion of the decommissioning activities and the completion of the Closure Audit.

A project team will be set up by Bulmers to manage the close-down of the site, the implementation of the Closure Plan and initiation of the Aftercare Management Plan. The project team will be advised by the site's Environmental Consultants throughout the implementation of the Closure Plan, while the EHS Management System will be maintained at the site until clean closure is effected.

8 CLOSURE PLAN VALIDATION

An independent consultant will monitor progress and advise on the proper implementation of the Closure Plan, including ensuring that the Agency is informed of progress.. Once the Closure Plan has been completed, the consultant will carry out a Closure Audit. This audit will verify that the criteria for successful closure, as set out in Section 4.1, have been achieved. A Closure Audit report will be prepared and issued to the Agency.

9 RESTORATION AND REMEDIATION PROPOSALS

As set out in Section 2, due to the nature of the historical and current activities at the site and the results of previous site investigations, Bulmers does not envisage the need to restore or remediate any part of the site following closure. This position will be reviewed during the annual review of the Residuals Management Plan and upon completion of the Closure element of the plan.

10 AFTERCARE MANAGEMENT

Following closure of the site and successful completion of the Closure Plan, the Aftercare Management Plan will be implemented. As part of this plan, the following services will be maintained at the site until clean closure has been demonstrated or until the sale and hand-over of the site is complete.

- The environmental monitoring programme, as agreed with the Agency.
- Site security.
- General building and site maintenance.
- Heating and lighting as required.

10.1 Aftercare Monitoring

The Bulmers Annerville site is designated a Risk Category 2 site under the Agency's guidance note. Based on existing information, the site presents a low risk of residual contamination. It is therefore proposed to carry out only a programme of passive aftercare to monitor the site for signs of residual contamination once activity on site has ceased.

This monitoring programme will consist of a continuation of the routine monitoring of the groundwater monitoring locations set out in the licence (GW1 and GW2) and the monitoring of the production wells. The frequency and scope of monitoring of the production wells will be agreed with the Agency in advance.

Where additional monitoring is considered necessary, the monitoring programme will be expanded in agreement with the Agency. It is envisaged that the monitoring will be continued for no more than 12 months after closure and consist of no more than 4 monitoring rounds for the groundwater monitoring locations over that period. The criteria for demonstrating clean closure from this monitoring programme are described in Section 4.2.

11 AFTERCARE MANAGEMENT PLAN COSTING

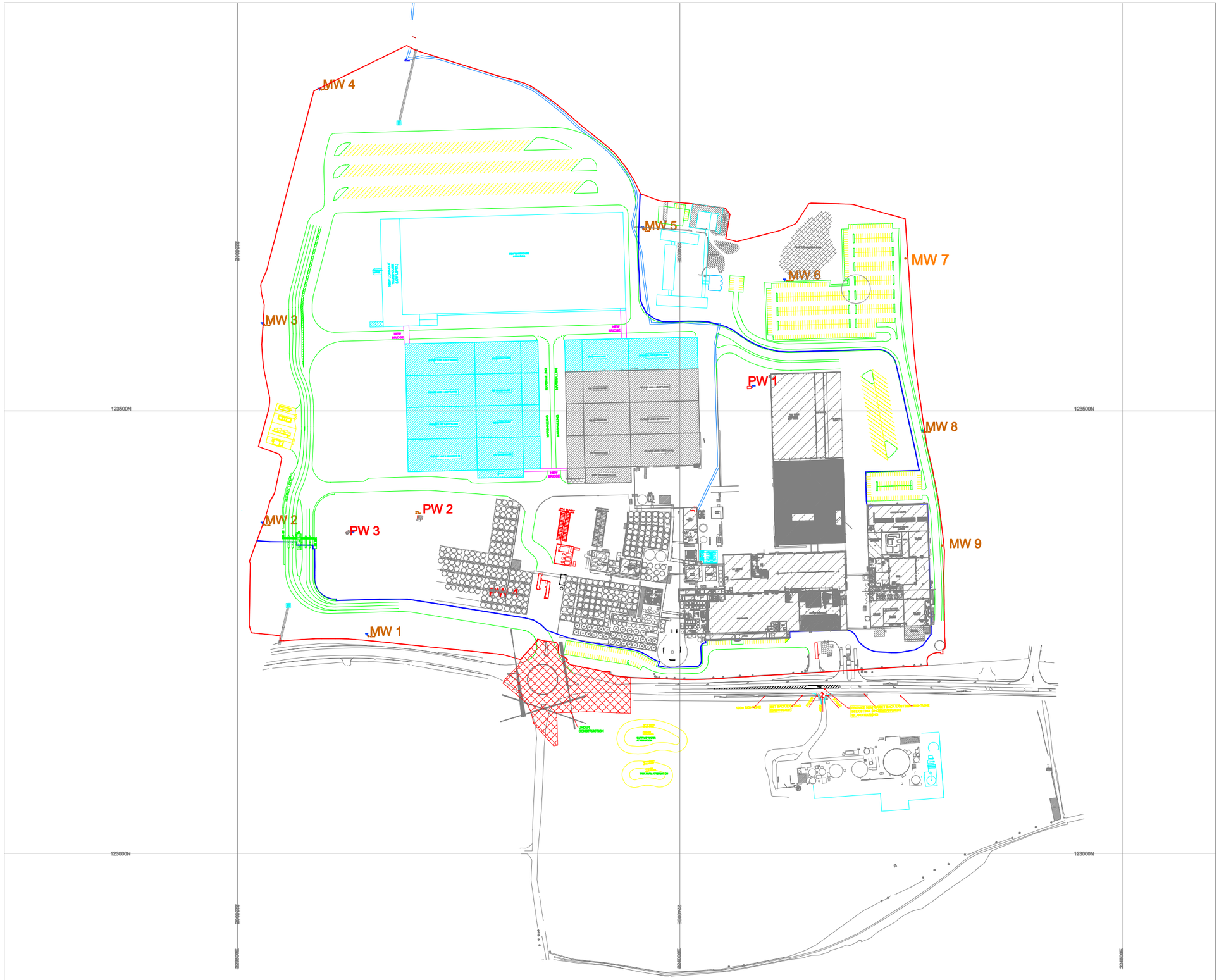
Table 5 lists the estimated costs associated with implementing the Aftercare Management Plan. The main element of this plan is the continuation of the environmental monitoring programme which will be continued for a period up to six months following closure of the site. In addition to the costs associated with this plan, costs will also be incurred for the maintenance of the site (including site security) during this period.

Table 5: Costing for Aftercare Management Plan

Item	Description	Estimated Cost (€)
1	Bulmers personnel to oversee the Aftercare Management Plan	57,000
2	Aftercare monitoring programme (groundwater)	2,000
3	Aftercare monitoring programme (production wells)	8,000
	Subtotal	*67,000*
4	Contingency (25%)	16,750
	Total Estimated Aftercare Management Cost	***83,750***

* * * * *

APPENDIX 1 : SITE PLAN OF BULMERS ANNERVILLE



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Ph: +353 45 895666 Fax: +353 45 875444 Mob: +353 87 2300933
info@groundwatereng.ie

Client: Bulmers Irl Ltd

Project: Annervill Ground Water Level Monitoring Network

Title: Location of Ground Water Monitoring Wells

Figure No. 1

Date: November 2007

Scale: 1:1,750

Author: D Broderick

Checked by: S. O' Neill

N

Bulmers Showerings (Ireland) Ltd

Annerville, Clonmel, Co. Tipperary

IPPC Licence No: P0443-02

Day and Night Time Noise Survey

Report Date:
29th December 2009

EURO environmental services

Unit 35A, Boyne Business Park, Drogheda, Co Louth

Report No. 2940/M04

1.0 Introduction

A noise survey was carried out on 5 pre-determined monitoring points at the Bulmers Showerings Annerville site on the 17th and 18th December 2009 by Victor Olmos of EURO environmental services. Bulmer's Showerings Ireland is required to carry out a noise survey in accordance with condition 6.12 of their IPPC licence number P0443-02. Activities on the site continued as normal during the monitoring period.

2.0 Duration and Measurements of Surveying

The daytime survey was carried out between 12:28 and 15:48 on Thursday, 17th of December 2009. The following measurements were carried out at each site:

- Daytime Broadband measurements $L(A)_{eq}$, $L(A)_{10}$, $L(A)_{90}$, $L(A)_{50}$, $L(A)_{1}$ and $L(A)_{99}$ over a 30 minute period.

The night time survey was carried out between 22:00 on Thursday, 17th December and 00:47 on Friday, 18th December 2009. The following measurements were carried out at each site:

- Night time Broadband measurements $L(A)_{eq}$, $L(A)_{10}$, $L(A)_{90}$, $L(A)_{50}$, $L(A)_{1}$ and $L(A)_{99}$ over a 30 minute period.

3.0 Weather Conditions

Daytime weather conditions were overcast with occasional sunny spells, cold and calm. Night time weather conditions were calm and cold.

4.0 Location of Monitoring Points

NML01 was located on hard ground on the Ferry House road, to the opposite side of the N24 road. Noise meter was located 200 meters away from premises boundary and 150 meters from Ferry House.

NML02 was located on hard ground close to the northern boundary of site. Noise meter was located 3 meters away from the northern boundary fence and 300 meters away from site buildings.

NML03 was located on hard ground in front of the main gate of the nearest neighbor's house by the N24 road, to the south-west from premises. Noise meter was located 15 meters away from the house and 200 meters away from Bulmer's premises.

NML04 was located on hard ground at the car park on the northeastern site boundary. Noise meter was located 20 meters away from a nearby house and 100 meters from buildings on site. There was a line of trees between premises and the house.

NML05 was located on hard ground on the southeastern boundary of site. Noise meter was located 15 meters away from site buildings and 20 meters from nearby house. There was a line of trees between premises and the house.

5.0 Activities on Site

Activities continued as normal during the noise survey. Tractors and trailers were in operation, cars passed through the site car parks, low general hum of factory processes.

6.0 Methodology

The noise survey was carried out in accordance with ISO 1996/1/2/3 – Acoustics – Description and Measurement of Environmental Noise and The Environmental Noise Survey Guidance Document issued by the EPA.

Reference was also made to the guidance note issued by the Environmental Protection Agency for the assessment of noise from licensed facilities.

Broadband measurements were 30-minute intervals, in the set range 30 – 90dB.

The meter was calibrated before and after the survey.

7.0 Equipment

The equipment used was a Bruel & Kjaer 2250 serial No. 2463166 integrating sound pressure meter, with selective 1:1 or 1:3 octave band measurements.

The meter was fixed to a tripod 1.3 meters above ground level and the microphone was protected using a windshield. The microphone cartridge type was BK4189, serial number 2457949 with open circuit sensitivity level of 53.2 mV per Pa.

8.0 Calibration

Calibration was carried out on site using an acoustic calibrator at 94dBA. The meter was calibrated before and after the monitoring round.

9.0 Noise Measurements – Day Time Hours

Monitoring Point	Location	Date/ Time	Sampling Interval minutes	L(A)eq	$L(A)_{10}$	$L(A)_{90}$	Comments
NML01	Ferry House road	17/12/2009 14:46	30	**67**	70	51	No noise audible from Bulmer's premises. Traffic on N24 road was the main source of noise at this location. This comprised of 2 HGVs and several cars.
NML02	Warehouse north	17/12/2009 14:01	30	51	49	43	Main source of noise at this location was produced by vehicles driving along site, lorries idling, reverse beeping sirens and a constant slight hum coming from Bulmer's premises. Interference noise included a chain saw in operation at the Woods to the rear of the site, birds singing and an excavator in operation.
NML03	N24 road south	17/12/2009 15:18	30	**79**	82	66	No noise audible from Bulmer's premises at this monitoring location. Frequent traffic on N24 road was the main source of noise at this location. This comprised of several HGVs and Cars.
NML04	North East corner	17/12/2009 12:28	30	55	57	49	A constant low level hum coming from Bulmer's premises, vehicles exiting car park, forklifts and lorries operating and reverse beeping sirens in the distance. Interference noise included traffic on the N24 road, birds singing, dogs barking in the distance and a grinder/power saw operating.
NML05	South east corner	17/12/2009 13:05	30	55	55	49	Vehicles entering and exiting the site passing by the monitoring location, a low level hum from Bulmer's premises, reverse beeping siren and noise from lorry movement on site. Interference noise was generated from frequent traffic on N24 road.

9.1 Noise Measurements – Night Time Hours

Monitoring Point	Location	Date/ Time	Sampling Interval minutes	L(A)eq	$L(A)_{10}$	$L(A)_{90}$	Comments
NML01	Ferry House road	17/12/2009 23:46	30	**56**	52	43	No noise audible from the Bulmer's premises. Traffic on N24 road was the main source of noise at this location.
NML02	Warehouse north	17/12/2009 22:00	30	**54**	54	53	No noise audible from the Bulmer's premises. Interference noise included traffic movements in the distance and noise from the operation of an adjacent factory.
NML03	N24 road south	18/12/2009 00:17	30	**69**	71	42	No noise audible from the Bulmer's premises. Traffic on N24 road was the main source of noise at this location.
NML04	North East corner	17/12/2009 22:38	30	**49**	50	48	No noise audible from the Bulmer's premises. Interference noise included traffic movements in the distance and noise from the operation of an adjacent factory.
NML05	South east corner	17/12/2009 23:10	30	44	47	39	No noise audible from the Bulmer's premises. Interferences noise included noise from the operation of an adjacent factory and frequent traffic movement on the N24 Road.

10.0 1/3 Octave Measurements

A tonal component was detected at monitoring location NML04 during night time monitoring at frequency of 160 Hz (56.5 dB). The tonal component may be attributable to activities from an adjacent facility.

Tonal components were detected at monitoring location NML03 at frequencies of 63 Hz (64.6 dB) and 100 Hz (65.5 dB) during the night time monitoring. The tonal components may be attributable to diesel engines of the vehicles traveling on N24 road.

11.0 Summary and Conclusions

Noise levels should not exceed 55 dB(A) during day time hours and 45 dB(A) during night time hours as agreed with the Environmental Protection Agency in Schedule B.4 of the IPPC licence P0443-02.

Two of the locations, NML01 and NMl03, exceeded the noise limit during the daytime survey. At these locations, no noise could be heard arising from the Bulmer's premises and all noise can be attributed to passing traffic.

Four monitoring locations exceeded the noise limit during night time survey (NML01, NML02, NML03 and NML04). There was no noise audible from the Bulmer's premises at all monitoring locations, with elevated noise levels caused by external/ interference noise sources.

Background noise sources, particularly traffic movement on the N24 caused elevations in noise levels recorded at locations NML01, NML03, NML04 and NML05 during both daytime and night time hours.

Two tonal components were detected during survey at night at monitoring location NML03. The source of the tonal components may be attributable to engines of vehicles traveling along the N24 Road.

A tonal component was identified at NML04 during the night time monitoring. The source of the tonal component may be attributable to activities at an adjacent facility.

Aadil Khan
Environmental Technical Manager

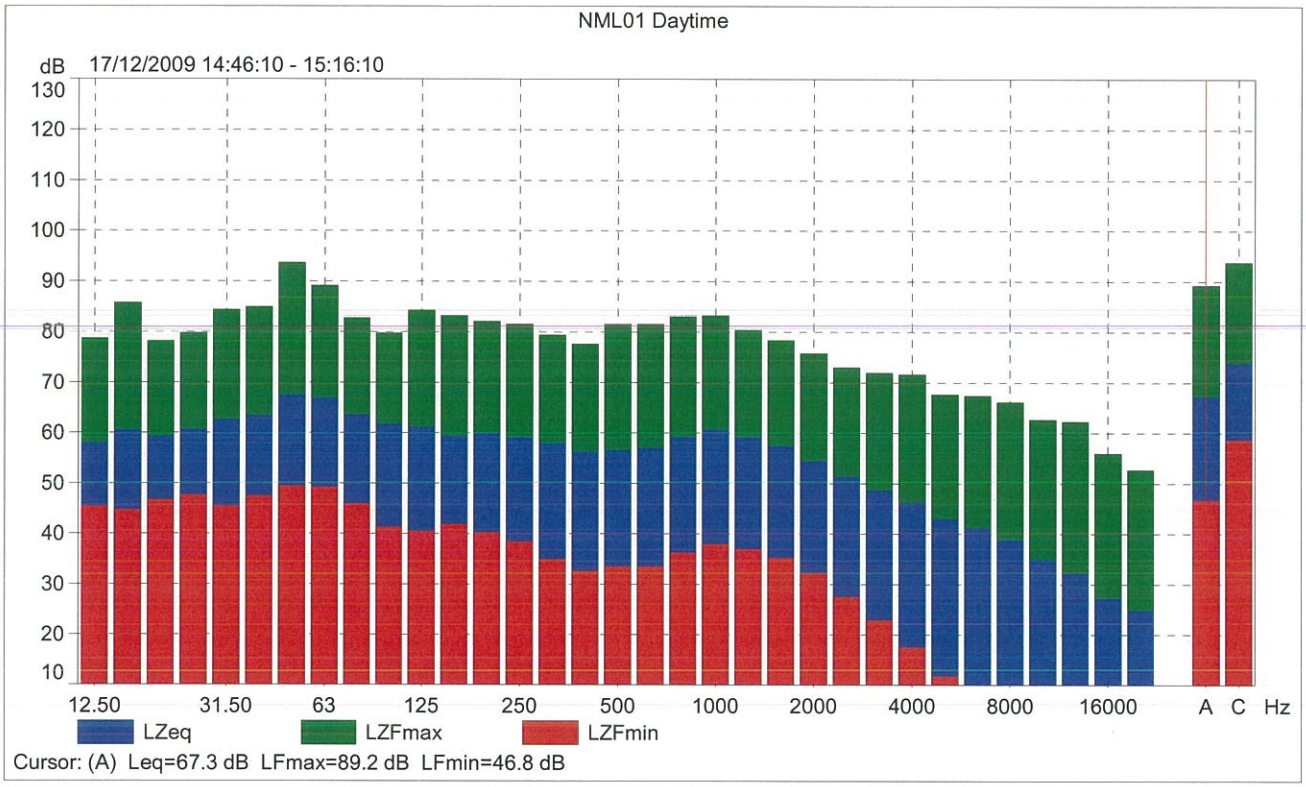
David Kelly
Field Services Manager

29th December 2009

Appendix 1: Broadband Data and 1/3 Octave Spectra

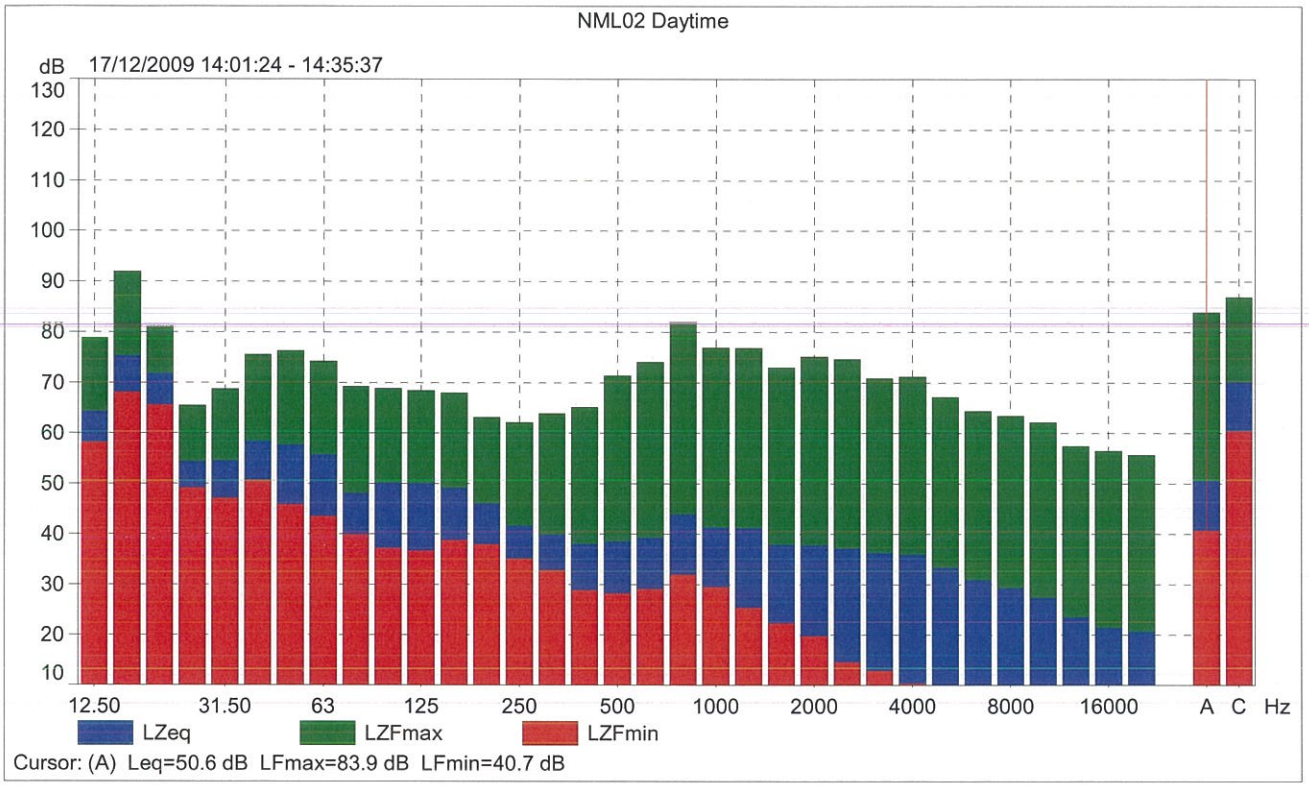
NML01 Daytime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	89.2	46.8	67.3	70.0	51.2	103.5
Time	14:46:10	15:16:10							15:11:23
Date	17/12/2009	17/12/2009							17/12/2009



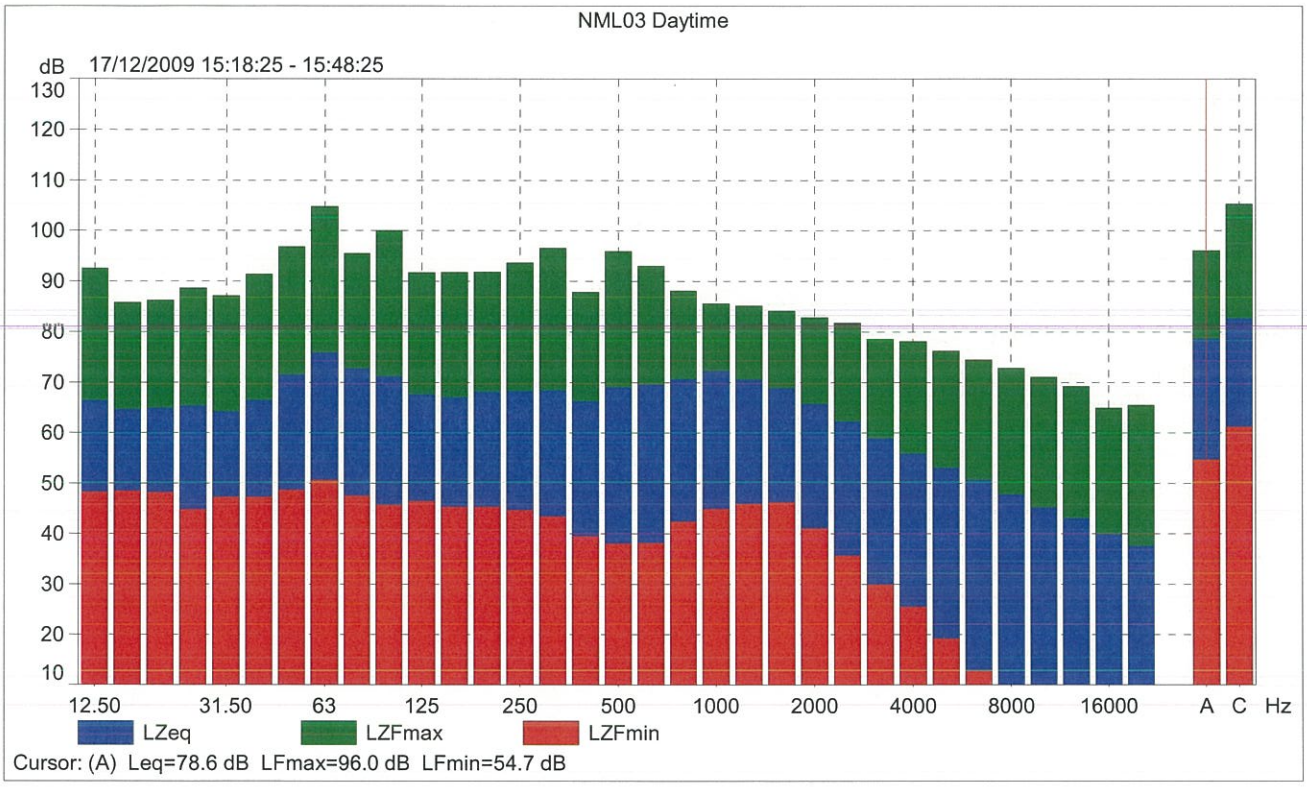
NML02 Daytime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	83.9	40.7	50.6	48.9	43.3	106.1
Time	14:01:24	14:35:37							14:01:52
Date	17/12/2009	17/12/2009							17/12/2009



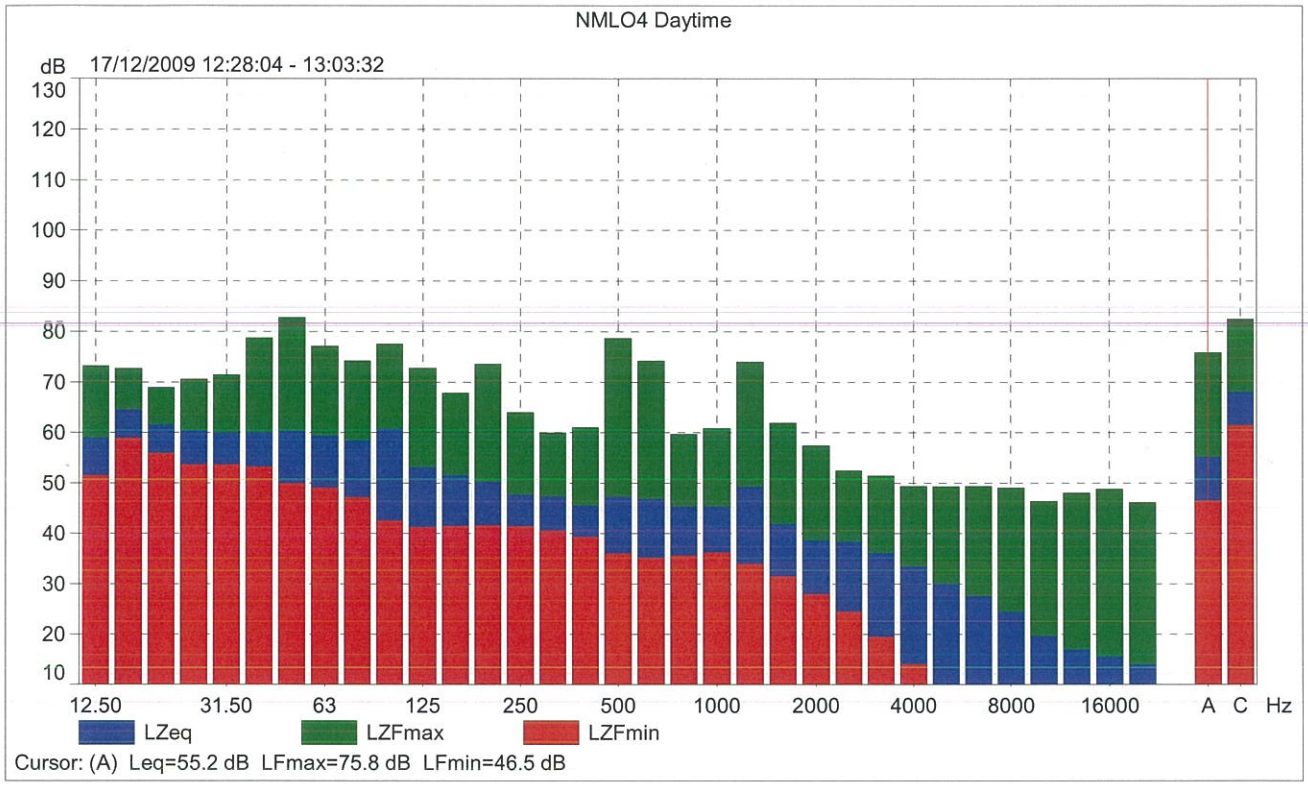
NML03 Daytime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	96.0	54.7	78.6	82.1	66.1	113.9
Time	15:18:25	15:48:25							15:33:44
Date	17/12/2009	17/12/2009							17/12/2009



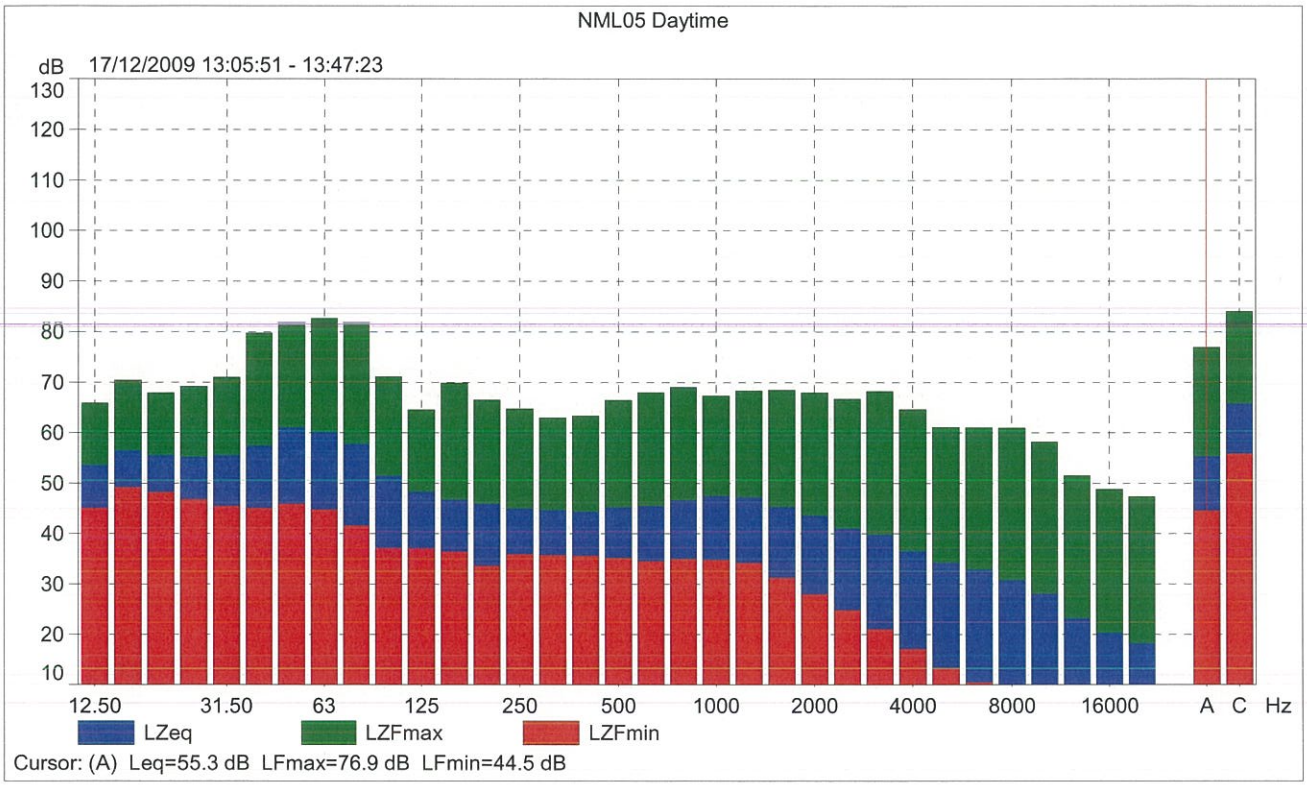
NMLO4 Daytime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	75.8	46.5	55.2	57.4	49.2	89.6
Time	12:28:04	13:03:32							12:31:12
Date	17/12/2009	17/12/2009							17/12/2009



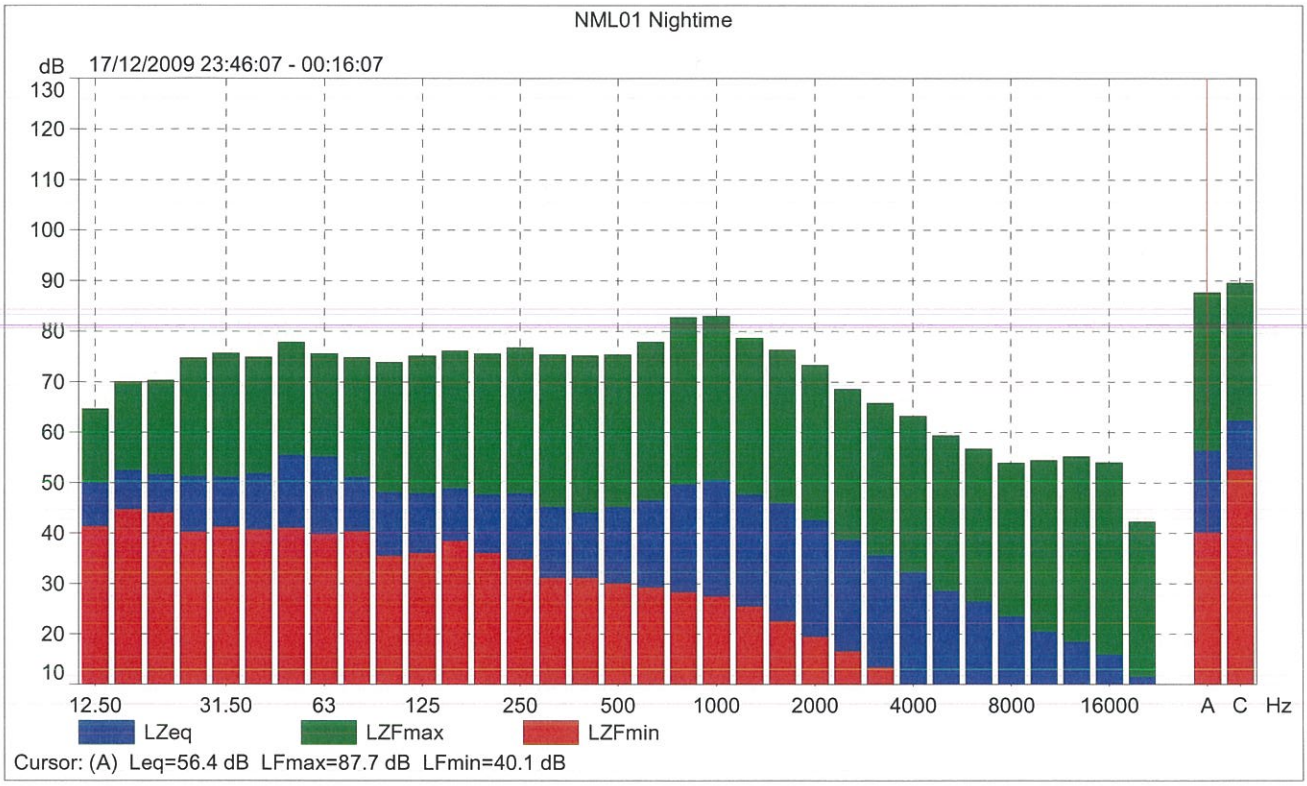
NML05 Daytime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	76.9	44.5	55.3	55.0	48.7	93.3
Time	13:05:51	13:47:23							13:20:47
Date	17/12/2009	17/12/2009							17/12/2009



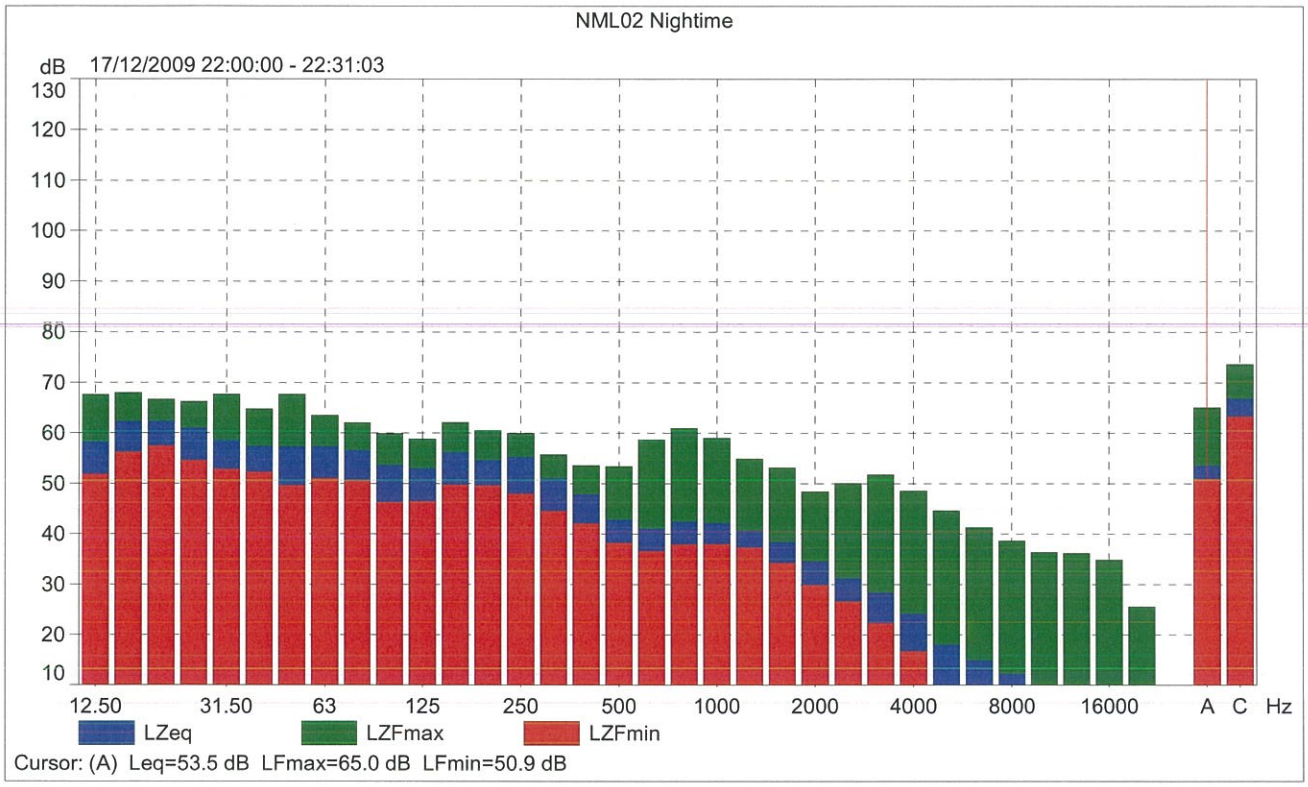
NML01 Nightime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	87.7	40.1	56.4	51.6	43.0	100.5
Time	23:46:07	00:16:07							00:10:13
Date	17/12/2009	18/12/2009							18/12/2009



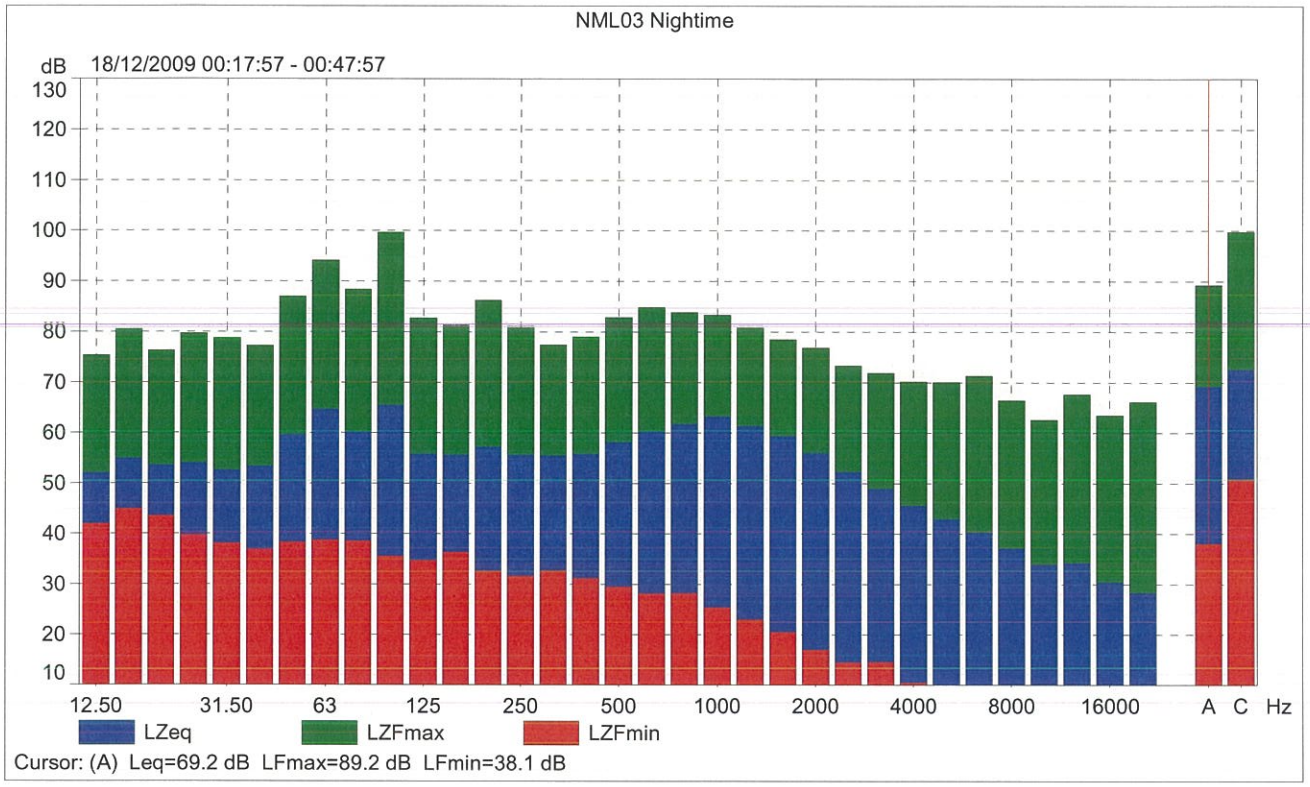
NML02 Nightime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	65.0	50.9	53.5	54.4	52.5	87.3
Time	22:00:00	22:31:03							22:01:07
Date	17/12/2009	17/12/2009							17/12/2009



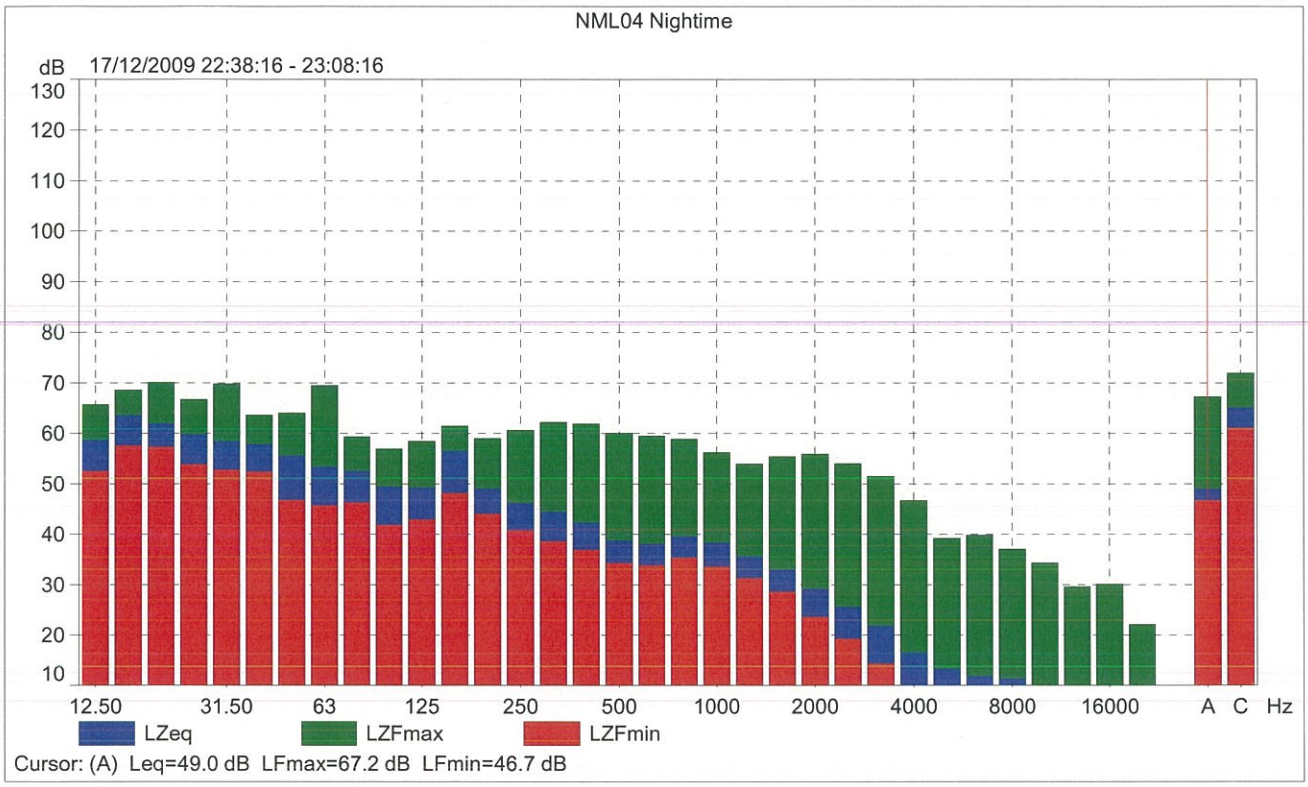
NML03 Nightime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	89.2	38.1	69.2	70.5	41.6	107.7
Time	00:17:57	00:47:57							00:39:07
Date	18/12/2009	18/12/2009							18/12/2009



NML04 Nightime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	67.2	46.7	49.0	49.7	48.1	94.9
Time	22:38:16	23:08:16							23:06:19
Date	17/12/2009	17/12/2009							17/12/2009



NML05 Nightime

	Start time	End time	Overload [%]	LAFmax [dB]	LAFmin [dB]	LAeq [dB]	LAF10 [dB]	LAF90 [dB]	LCpeak [dB]
Value			0.00	54.4	36.2	43.7	46.8	39.4	83.4
Time	23:10:29	23:40:29							23:26:25
Date	17/12/2009	17/12/2009							17/12/2009