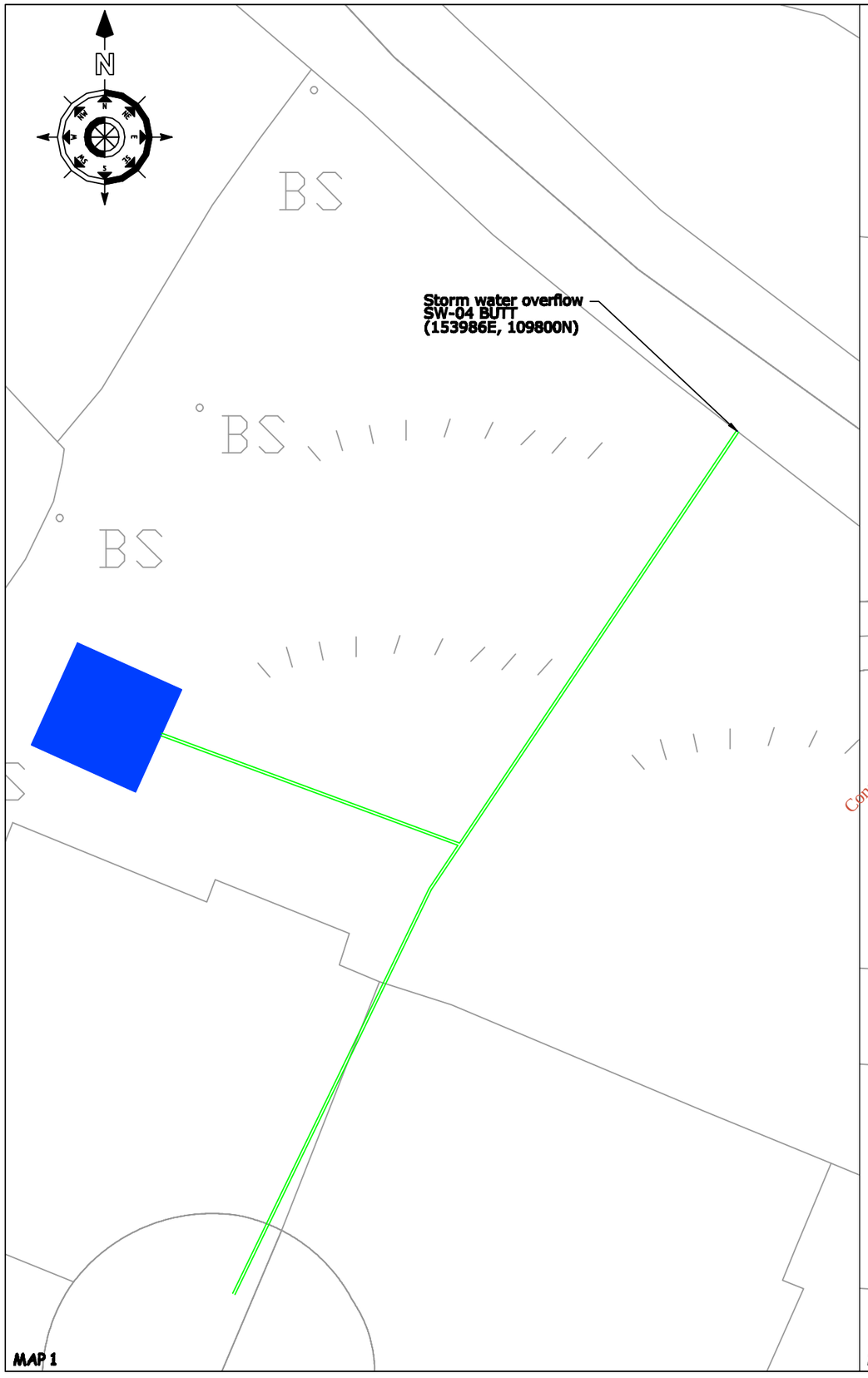

NOTES

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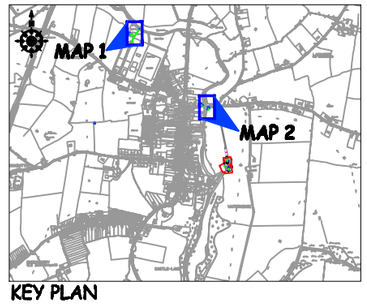
3. This drawing is to be read in conjunction with all other contract drawings.



KEY PLAN

No.	Date	Drwn	Surv	Chkd	Revision Description

Cork County Council,
Northern Division.

N. O'KEEFFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
Buttevant & Environs
Waste Water Discharge
Licence Application

Drawing Title:
Locations of Storm water overflow Points
SW02, SW03 & SW04 Butt
Attachment B5 - Map 8

Scales:	Surveyed by:	Drawn by:
1:500 @ A3	D.L.	D.L.
Designed by:	**Checked by:**	**Date:**
F.J.	F.C.	August 2008
Drawing number:		**Rev:**
B5-Map 8		-

Extracts from Council Meeting held on 8th December, 2003:

REPORT UNDER ARTICLE 179 OF THE LOCAL GOVERNMENT (PLANNING AND DEVELOPMENT) ACT, 2000:

12(c)/12

Proposed by Councillor K. O'Keeffe

Seconded by Councillor P. Buckley

RESOLVED:

"Noting that in accordance with Article 81 of the Local Government (Planning and Development) Regulations, 2001, notice of the proposed development was published, that no submission was received in respect of the proposal, approval pursuant to Article 179 of the said Act is given for the following:-

Construction of a Sewerage Scheme (Collection System) Buttevant, Co. Cork.

REPORT UNDER ARTICLE 179 OF THE LOCAL GOVERNMENT (PLANNING AND DEVELOPMENT) ACT, 2000:

12(d)/12

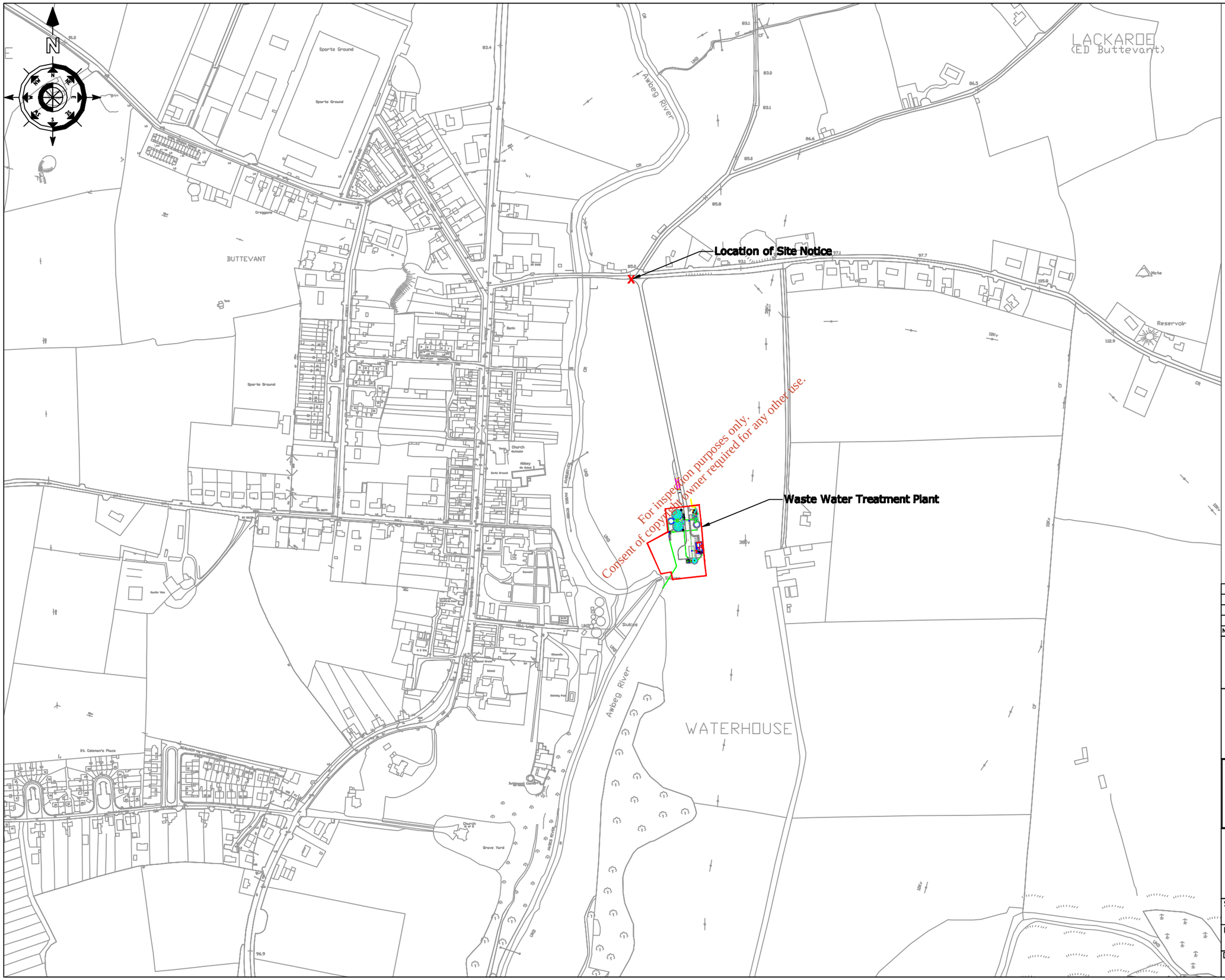
Proposed by Councillor K. O'Keeffe

Seconded by Councillor P. Buckley

RESOLVED:

"Noting that in accordance with Article 81 of the Local Government (Planning and Development) Regulations, 2001, notice of the proposed development was published, that two submissions were received in respect of the proposal, approval pursuant to Article 179 of the said Act is given for the following:-

Construction of Waste Water Treatment Plant at Buttevant, Doneraile and Kilbrin, Co. Cork.



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No.	Date	Drwn	Surv	Chkd	Revision Description

Cork County Council,
Northern Division.

N. O'KEEFFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
Buttevant & Environs
Waste Water Discharge
Licence Application

Drawing Title:
Location of Site Notice
Attachment B8 - Map 9

Scales:	Surveyed by:	Drawn by:
1:5000 @ A3	D.L.	D.L.
Designed by:	**Checked by:**	**Date:**
F.J.	F.C.	August 2008
Drawing number:		**Rev.**
B8 - Map 9		-

CORK COUNTY COUNCIL

SITE NOTICE

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow is applying to the Environmental Protection Agency for a Waste Water Discharge Licence for the Agglomeration of Buttevant at the following location:

Plant Name	Location	National Grid Ref.
Buttevant WWTP	Waterhouse, Buttevant	E154564 N108924

Discharge	Function	Townland	Receptor	Grid Reference
Primary	**Main**	**Waterhouse**	**Awbeg**	**E154528 N108856**

A copy of the application for the Waste Water Discharge Licence and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall as soon as is practicable after receipt by the Agency be available for inspection or purchase at the

- **Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335599 Telephone: 053-9160600 Fax: 053-9160699 Email:info@epa.ie**

and at

- **Cork County Council Offices, Annabella, Mallow, Co. Cork, Telephone: 022-21123 Fax: 022-21983**

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

Newspaper Advertisement

Cork County Council Northern Division

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow is applying to the Environmental Protection Agency for a Waste Water Discharge Licence for the Agglomeration of Buttevant at the following location:

Plant Name	Location	National Grid Ref.
Buttevant WWTP	Waterhouse, Buttevant	E154564 N108924

Discharge	**Function**	**Townland**	**Receptor**	**Grid Reference**
Primary	**Main**	**Waterhouse**	**Awbeg**	**E154528 N108856**

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and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Telephone: 022-21123 Fax: 022-21893.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

CORK COUNTY COUNCIL 1899

CORK COM

PUBLIC NOTICES

NORTHERN DIVISION

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Newmarket at the following locations:

Plant Name	Location	National Grid Ref.
Newmarket WWTP	Newmarket	E131004 N106843

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Newmarket	Dalua	E130956 N106837

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email:info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Buttevant at the following locations:

Plant Name	Location	National Grid Ref.
Buttevant WWTP	Waterhouse, Buttevant	E154564 N108924

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Waterhouse	Awbeg	E154528 N108856

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

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and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Castletownroche at the following locations:

Plant Name	Location	National Grid Ref.

PUBLIC NOTICES

NORTHERN DIVISION

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Kilworth at the following locations:

Plant Name	Location	National Grid Ref.
Kilworth WWTP	Knockanohill, Kilworth	E184090 N102434

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Knockanohill	Douglas	E184362 N102659

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email:info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Millstreet, Co. Cork at the following locations:

Plant Name	Location	National Grid Ref.
Millstreet WWTP	Drominahilla	E127399 N090983

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Drominahilla	Tanyard	E127398 N091013

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email:info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

SOUTHERN DIVISION

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Southern Division of Cork County Council, Carrigrohane Road, Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Ladysbridge at the following locations:

PUBLIC

SOUTHERN

APPLICATIO AGENCY FO

In accordance Regulations 20 County Counc Environmenta Licence for th locations:

Plant Name
Cloyne WWT

Discharge
Primary

A copy of the and such furth furnished to th of the Applicat the Agency, be

- Environme Castle Esta Tel: 053-91

and at

- Cork Coun County Hal Tel: 021-427

Submissions the Environm described ab

APPLICATIO AGENCY FO

In accordance Regulations 20 Council, Carrig Protection Age Agglomeration

Plant Name
Killeagh WW

Discharge
Primary
Primary (Proposed)

A copy of the and such furth furnished to th of the Applicati the Agency, be

- Environme Castle Esta Tel: 053-91

and at

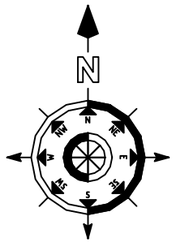
- Cork Coun County Hal Fax: 021 - 4

Submissions the Environm described ab

APPLICATIO AGENCY FO

In accordance Regulations 20 County Counci Environmental Licence for the locations:

Plant Name
Killeens WWT



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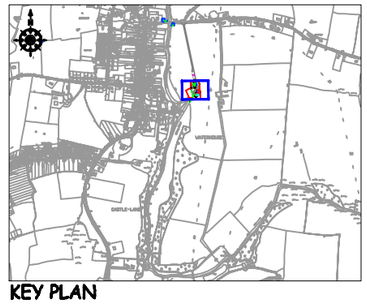


KEY PLAN

No.	Date	Drwn	Surv	Chkd	Revision Description

Cork County Council,
Northern Division.

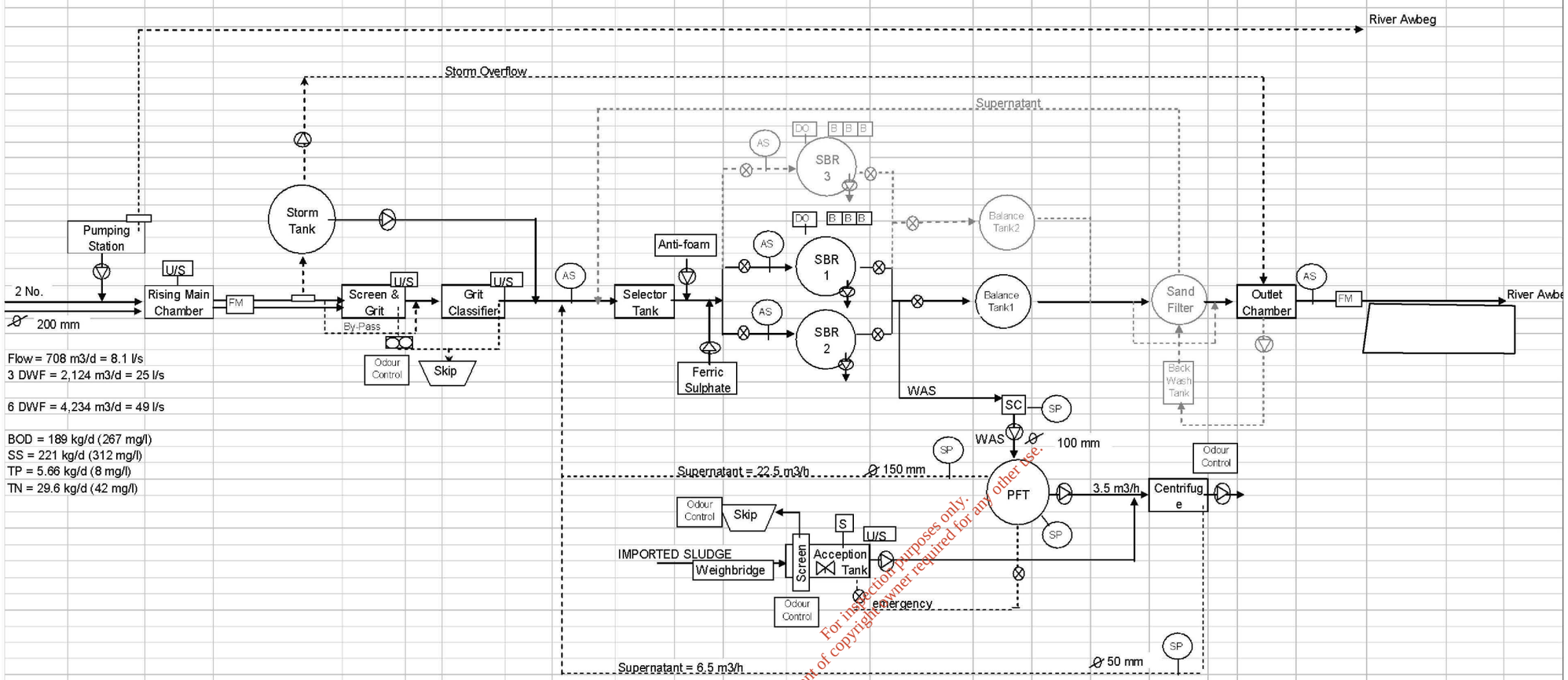
N. O'KEEFFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
Buttevant & Environs
Waste Water Discharge
Licence Application

Drawing Title:
Layout of Waste Water Treatment Plant
Attachment C1 - Map 10

Scales:	Surveyed by:	Drawn by:
1:500 @ A3	D.L.	D.L.
Designed by:	**Checked by:**	**Date:**
F.J.	F.C.	August 2008
Drawing number:		**Rev:**
C1 - Map 10		-

Buttevant WWTP



Flow = 708 m3/d = 8.1 l/s
3 DWF = 2,124 m3/d = 25 l/s

6 DWF = 4,234 m3/d = 49 l/s

BOD = 189 kg/d (267 mg/l)
SS = 221 kg/d (312 mg/l)
TP = 5.66 kg/d (8 mg/l)
TN = 29.6 kg/d (42 mg/l)

Pump Sump	2.1m dia x 2 m deep	**SBR** (each)	V = 1,032 m3	**PFT**	Volume = 105m3
	3 No. Inlet Pumps		16.21m dia x 5.6m side wall		3d Storage @ 2-3% DS
	(Duty/Duty/Standby)		0.75m freeboard (5.5 m sidewall)		5.97 m dia x 4.264 m side wall
	Flow = 2,124 m3/d = 88.5 m3/h		1.46d Retention Time @ DWF		
	1 No. 6mm Screen		MLSS = 3.5 g/l	**WAS**	2 No. WAS Pumps (Duty/Standby)
			1 No. Drain out pumps		Flow = 30 m3/h @ 0.75%DS
Storm Tank	V = 177 m3		Flow = 129 m3/h @ 8h		
	8m dia x 4 m deep				
	2 h RT @ 3 DWF	**Blowers**	3 No. Blowers (2Duty/1Standby)		
	2 No. Storm Return Pumps	each	299.5 kg O2/d = 37.4 kg/h		
	Flow = 2,124 m3/d = 88.5 m3/h		499 Nm3/h @ 600 mbar		
Screen & Grit	2 No. Screens (Duty/Standby)	**Balance Tank**	V = 185 m3		
	Max. Flow = 4,234 m3/d = 176.5 m3/h		7.68 m dia x 4.264m side wall		
	6mm screen		2 h RT @ 3 DWF		
	316 Stainless Steel				
	Screenings Macerated, Washer and Compaction	**Sludge Acception Tank**	Volume = 23 m3		
	Sealed Skip	**& Emergency Storage**	5d Storage		
	By-pass Manual raked 10mm Screen		1 No. Mixer		
			1 No. Weghbridge		
Grit Classifier	Max. Flow = 4,234 m3/d = 176.5 m3/h		1 No. Screen for liquid sludges		
	Grit Washer				
		Ferric Dosing	1 m3 IBC		
Selector Tank	V = 15 m3		Bund		
	10 min RT @ 3 DWF		Storage Capacity = aprox 25 d		
			2 No. Dosing Pump		
			Flow = 38 l/d = 2.5 l/h		

U/S	Level Sensor	DO	Dissolved Oxygen Meter
FM	Flow Meter		2 No. Pumps
	Mixer	B B B	Blowers
AS	Automatic Refrigerated Sampler		Future
			Bar screen
SP	Sampling Point		Macerator

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No.	Date	Drwn	Surv	Chkd	Revision Description

Cork County Council,
Northern Division.

N. O'KEEFFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
Buttevant & Environs
Waste Water Discharge
Licence Application

Drawing Title:
Schematic showing Existing Treatment Plant Process
Attachment C1 - Drawing 1

Scales: 1:5000 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: C1 - Drawing 1		Rev: -

Attachment E4 Buttevant Downstream Table E4

Sample Date	23/03/2006	12/04/2006	04/05/2006	28/09/2006	10/04/2008	13/06/2008	17/7/2008	24/9/2008	9/10/2008	7/1/2009	22/01/2009	
Sample	River	River	River	River	River	River	River	River	River	River	River	Average
Sample Code					GS333	GS545	GS664	GS973	GS1047	GT036	GT105	
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	
pH	8.1	8.2	8.3	7.6	*	*	7.9	*	*	7.9	7.6	7.942857
Temperature ℃	*	*	*	*	*	*	*	*	*	4.5	6.6	5.55
Cond 20℃	*	*	*	*	*	*	465	*	*	562	406	477.6667
SS mg/L	*	*	*	*	*	<2.5	3	*	*	5	10	4.81
NH_3 mg/L	<0.1	<0.1	<0.1	<0.1	*	<0.1	<0.1	*	*	<0.05	0.09	0.0519
BOD mg/L	<1	1.6	1.4	1.6	*	1.23	<1.0	*	*	<2	<2	1.1038
COD mg/L	<21	*	<21	*	*	*	<21	*	*	<21	31	14.6
TN mg/L	3.61	3.75	2.8	5.1	*	4.4	3.2	*	*	3.6	2.5	3.62
Nitrite mg/L	*	*	*	*	*	*	0.022	*	*	*	*	0.022
Nitrate mg/L	*	*	*	*	*	*	2.72	*	*	*	*	2.72
TP mg/L	<0.2	<0.2	<0.2	<0.2	*	*	<0.2	*	*	0.08	0.09	0.0957
O-PO4-P mg/L	*	*	*	*	<0.05	<0.05	0.06	<0.05	<0.05	0.07	0.06	0.0443
SO4 mg/L	*	*	*	*	*	*	<30.0	*	*	*	*	<30
Phenols µg/L	*	*	*	*	*	*	<0.10	*	*	*	*	<0.10
Atrazine µg/L	*	*	*	*	*	*	<0.01	*	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	<1	*	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	<0.01	*	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	<1	*	*	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	<1	*	*	*	*	<1
Arsenic µg/L	*	*	*	*	*	*	1	*	*	*	*	1
Chromium mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Copper mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	<5	*	*	*	*	<5
Fluoride µg/L	*	*	*	*	*	*	80	*	*	*	*	0.08
Lead mg/L	*	*	*	*	*	0.025	0.026	*	*	<0.02	<0.02	0.0162
Nickel mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Zinc mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Boron mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	0.4	*	*	*	*	0.4
Selenium µg/L	*	*	*	*	*	*	1	*	*	*	*	1
Barium mg/L	*	*	*	*	*	0.027	0.033	*	*	<0.02	<0.02	0.02

values recorded as 1/2 of LOD for statistical purposes

Attachment E4 Buttevant Discharge Outlet Table E4

Sample Date	28/06/2007	13/09/2007	27/09/2007	03/10/2007	24/10/2007	10/04/2008	13/06/2008	10/04/2008	13/06/2008	17/07/2008	24/09/2008	09/10/2008	07/01/2009	22/01/2009			
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Average	Kg/Day	Kg/year
Sample Code								GS332	GS544	GS662	GS972	GS1046	GT034	GT103	mg/L		
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2508		
pH	7.7	7.5	7.3	7.2	7.1	*	7.7	*	7.7	7.5	*	7.6	7.6	7.3	7.472727		
Temperature °C	*	*	*	*	*	*	*	*	*	*	*	*	*	*			
Cond 20°C	*	*	*	*	660	884	826	884	826	752	*	*	741	723	787		
SS mg/L	44	74	131	54	28	60	65	60	65	117	82	66	16	4	61.85714	155.1377	56625.26571
NH_3 mg/L	*	25.3	23.7	9.3	12.8	27.1	5.1	27.1	5.1	9.9	*	17	0.07	0.3	13.56417	34.01893	12416.90945
BOD mg/L	19	142	144	61	28	75	30	75	30	34.4	132	100	8	<2	67.56923	169.4636	61854.22523
COD mg/L	82	306	349	94	121	223	92	223	92	118	241	293	46	17	164.0714	411.4911	150194.2671
TN mg/L	26	*	37	16.2	29	45	95	45	95	25	*	35	7.6	8.5	38.69167	97.0387	35419.1255
Nitrite mg/L	*	*	*	*	*	*	*	*	*	0.634	*	*	*	*	0.634	1.590072	580.37628
Nitrate mg/L	*	*	*	*	*	*	*	*	*	11.7	*	*	*	*	11.7	29.3436	10710.414
TP mg/L	3.58	1.91	5.35	2.44	2.45	5.05	4.53	5.05	4.53	6.43	*	6.2	0.49	0.08	3.699231	9.277671	3386.349831
O-PO4-P mg/L	*	3.14	3.12	1.29	1.48	3.49	3.51	3.49	3.51	3.74	*	3.14	0.36	<0.05	2.751818	6.90156	2519.0694
SO4 mg/L	*	<30	<30	<30	<30	*	*	*	*	<30.0	*	<30.0	*	*	<30	<75.24	<27462.6
<	*	*	*	*	*	*	*	*	*	<0.10	*	*	*	*	<0.0001	<0.000250	<0.091542
Atrazine µg/L	*	*	*	*	*	*	*	*	*	<0.01	*	*	*	*	<0.0001	<0.000250	<0.091542
Dichloromethan	*	*	*	*	*	*	*	*	*	<1	*	*	*	*	<0.001	<0.002508	<0.91542
Simazine µg/L	*	*	*	*	*	*	*	*	*	<0.01	*	*	*	*	<0.00001	<0.000025	<0.0091542
Toluene µg/L	*	*	*	*	*	*	*	*	*	<1	*	*	*	*	<0.001	<0.002508	<0.91542
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	<1	*	*	*	*	<0.001	<0.002508	<0.91542
Arsenic µg/L	*	*	*	*	*	*	*	*	*	1	*	*	*	*	<0.00096	<0.002407	<0.8788032
Chromium mg/L	<20	*	*	<0.02	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	0.0267	0.066964	24.441714
Copper mg/L	21.5	*	*	<0.02	*	*	*	*	0.042	0.028	*	*	<0.02	<0.02	0.023	0.057684	21.05466
Cyanide µg/L	*	*	*	*	*	*	*	*	*	6	*	*	*	*	6	15.048	5492.52
Fluoride µg/L	*	*	*	*	*	*	*	*	*	420	*	*	*	*	420	1053.36	384476.4
Lead mg/L	<0.02	*	*	<0.02	*	*	*	*	0.045	0.04	*	*	<0.02	<0.02	0.115	0.28842	105.2733
Nickel mg/L	<0.02	*	*	<0.02	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02	<0.05016	<18.3084
Zinc mg/L	0.043	*	*	0.033	*	*	*	*	0.103	0.065	*	*	<0.02	<0.02	0.0442	0.110854	40.461564
Boron mg/L	*	*	*	*	*	*	*	*	0.11	0.045	*	*	<0.02	<0.02	0.04375	0.109725	40.049625
Cadmium mg/L	<0.02	*	*	<0.02	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02	<0.05016	<18.3084
Mercury µg/L	*	*	*	*	*	*	*	*	*	0.4	*	*	*	*	0.4	1.0032	366.168
Selenium µg/L	*	*	*	*	*	*	*	*	*	1	*	*	*	*	1	2.508	915.42
Barium mg/L	0.0955	*	*	0.033	*	*	*	*	0.28	0.146	*	*	0.09	0.065	0.11825	0.296571	108.248415

values recorded as 1/2 of LOD for statistical purposes

Maximum value of 2508 m3/day used for calculations

Attachment E4 Buttevant Upstream Table E4

Sample Date	23/03/2006	12/04/2006	04/05/2006	28/09/2006	10/04/2008	13/06/2008	17/07/2008	24/09/2008	09/10/2008	07/01/2009	22/01/2009	
Sample	River	River	River	River	River	River	River	River	River	River	River	**Average**
Sample Code					GS331	GS543	GS661	GS971	GS1045	GT035	GT104	
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	
pH	8	8.2	8.2	7.6	*	*	7.9	*	*	7.9	7.5	7.9
Temperature °C	*	*	*	*	*	*	*	*	*	3	6.5	4.75
Cond 20°C	*	*	*	*	*	*	442	*	*	533	385	453.3333
SS mg/L	15	<2.5	<2.5	4	*	<2.5	<2.5	*	*	2	12	4.36
NH_3 mg/L	0.1	<0.1	<0.1	<0.1	*	<0.1	<0.1	*	*	<0.05	0.06	0.0544
BOD mg/L	<1	1.4	1.3	1.5	*	1.66	1	*	*	2	<2	1.295
COD mg/L	21	*	<21	*	*	*	<21	*	*	13	25	16
TN mg/L	3.57	3.76	2.5	5.2	*	1.2	3.1	*	*	3	2.3	3.07875
Nitrite mg/L	*	*	*	*	*	*	0.0187	*	*	*	*	0.0187
Nitrate mg/L	*	*	*	*	*	*	1.94	*	*	*	*	1.94
TP mg/L	<0.2	<0.2	<0.2	<0.2	*	<0.2	<0.2	*	*	0.08	0.07	0.0944
O-PO4-P mg/L	*	*	*	*	<0.05	<0.05	0.06	<0.05	<0.05	0.06	0.06	0.04
SO4 mg/L	*	*	*	*	*	*	<30.0	*	*	*	*	<30.0
Phenols µg/L	*	*	*	*	*	*	<0.10	*	*	*	*	<0.10
Atrazine µg/L	*	*	*	*	*	*	<0.01	*	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	<1	*	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	<0.01	*	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	<1	*	*	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	<1	*	*	*	*	<1
Arsenic µg/L	*	*	*	*	*	*	1	*	*	*	*	1
Chromium mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Copper mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	<5	*	*	*	*	<5
Fluoride µg/L	*	*	*	*	*	*	340	*	*	*	*	<340
Lead mg/L	*	*	*	*	*	0.026	0.026	*	*	<0.02	<0.02	0.0178
Nickel mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Zinc mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Boron mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	<0.2	*	*	*	*	<0.2
Selenium µg/L	*	*	*	*	*	*	1	*	*	*	*	1
Barium mg/L	*	*	*	*	*	0.032	0.039	*	*	0.025	<0.02	0.0265

values recorded as 1/2 of LOD for statistical purposes

Attachment E4 Buttevant Downstream Table E4

Sample Date	23/03/2006	12/04/2006	04/05/2006	28/09/2006	10/04/2008	13/06/2008	17/07/2008	24/09/2008	09/10/2008	07/01/2009	22/01/2009	
Sample	River	River	River	River	River	River	River	River	River	River	River	**Average**
Sample Code					GS333	GS545	GS664	GS973	GS1047	GT036	GT105	
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	
pH	8.1	8.2	8.3	7.6	*	*	7.9	*	*	7.9	7.6	7.942857
Temperature °C	*	*	*	*	*	*	*	*	*	4.5	6.6	5.55
Cond 20°C	*	*	*	*	*	*	465	*	*	562	406	477.6667
SS mg/L	*	*	*	*	*	<2.5	3	*	*	5	10	4.81
NH_3 mg/L	<0.1	<0.1	<0.1	<0.1	*	<0.1	<0.1	*	*	<0.05	0.09	0.0519
BOD mg/L	<1	1.6	1.4	1.6	*	1.23	<1.0	*	*	<2	<2	1.1038
COD mg/L	<21	*	<21	*	*	*	<21	*	*	<21	31	14.6
TN mg/L	3.61	3.75	2.8	5.1	*	4.4	3.2	*	*	3.6	2.5	3.62
Nitrite mg/L	*	*	*	*	*	*	0.022	*	*	*	*	0.022
Nitrate mg/L	*	*	*	*	*	*	2.72	*	*	*	*	2.72
TP mg/L	<0.2	<0.2	<0.2	<0.2	*	*	<0.2	*	*	0.08	0.09	0.0957
O-PO4-P mg/L	*	*	*	*	<0.05	<0.05	0.06	<0.05	<0.05	0.07	0.06	0.0443
SO4 mg/L	*	*	*	*	*	*	<30.0	*	*	*	*	<30
Phenols µg/L	*	*	*	*	*	*	<0.10	*	*	*	*	<0.10
Atrazine µg/L	*	*	*	*	*	*	<0.01	*	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	<1	*	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	<0.01	*	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	<1	*	*	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	<1	*	*	*	*	<1
Arsenic µg/L	*	*	*	*	*	*	1	*	*	*	*	1
Chromium mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Copper mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	<5	*	*	*	*	<5
Fluoride µg/L	*	*	*	*	*	*	80	*	*	*	*	0.08
Lead mg/L	*	*	*	*	*	0.025	0.026	*	*	<0.02	<0.02	0.0162
Nickel mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Zinc mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Boron mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	*	*	*	<0.02	<0.02	*	*	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	0.4	*	*	*	*	0.4
Selenium µg/L	*	*	*	*	*	*	1	*	*	*	*	1
Barium mg/L	*	*	*	*	*	0.027	0.033	*	*	<0.02	<0.02	0.02

values recorded as 1/2 of LOD for statistical purposes

Parameter		Temperatu	Dissolved	pH	BOD	Nitrite	Molybdate	Ammonium	Nitrate	Dissolved I	Hardness	Alkalinity	Appearanc	Chloride	Dissolved	Suspended	Zn	Colour	Conductivi	Mg	Ca	Copper (D	Odour	Total Zinc
			O2		O2	NO2	P	NH4	NO3		CaCO3	CaCO3		Cl			Zn	Hz		Mg	Ca	Diss. Cu.		
Max		--	15	Varies	Varies	0.05	Varies	Varies	Varies	--	--	--	--	--	150	--	500	Varies	--	--	--	--	--	--
Target		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Min		--	5	Varies	--	--	--	--	--	--	--	--	--	--	50	--	--	--	--	--	--	--	--	--

Project	Location	Location R	Location E	Location N	Sample Ta	Sample Ra	Sample Da	Sample Ti	Comments	Degrees C	mg/l	pH units	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	mg/l	mg/l	Descriptive	mg/l	% O2	mg/l	µg/l	Hazen	µS/cm	mg/l	mg/l	mg/l	Descriptive	mg/l
Awbeg	Annagh Br	RS18A050	149806	115577	WFD Oper	2008/0632	10-Apr-08	10:50		8.2	11.5	8.1	0.3	0.034	0.013	0.066	17.1		156	222		22.4	101			32	471					
Awbeg	Annagh Br	RS18A050	149806	115577	WFD Oper	2008/1187	11-Jun-08	10:20		15.6	8	8.1	< 0.1	*0.066*	*0.037*	0.057	8.7		280	284	clear	21	79				533					
Awbeg	Annagh Br	RS18A050	149806	115577	WFD Oper	2008/2176	10-Sep-08	12:00		12.1		7	1.9	0.026	*0.036*	0.04	< 1.8		49	120	light brown	15.7				168	211					
Awbeg	Annagh Br	RS18A050	149806	115577	WFD Oper	2008/2853	22-Oct-08	11:55		9.1	9.7	7.9	1.4	0.035	*0.034*	0.075	12.6		211	202	clear	18.8	80			52	426					
									Sample Cour	4	3	4	4	4	4	4	4	0	4	4	-	4	3	0	0	3	4	0	0	0	-	0
									Maximum	15.6	11.5	8.1	1.9	0.066	0.037	0.075	17.1		280	284	-	22.4	101			168	533				-	
									Minimum	8.2	8	7	< 0.1	0.026	0.013	0.04	< 1.8		49	120	-	15.7	79			32	211				-	
									Mean	11.2	9.73	7.78	0.912	0.04	0.03	0.06	9.82		174	207	-	19.5	86.7			84	410				-	
									Median	10.6	9.7	8	0.85	0.034	0.035	0.062	10.6		184	212	-	19.9	80			52	448				-	
									Std. Deviatio	3.35	1.75	0.525	0.882	0.018	0.011	0.015	6.87		97.6	67.7	-	2.92	12.4			73.4	140				-	
Awbeg	Br in Castletownroche				Phosphate	2008/1242	18-Jun-08	10:15		12.8	9.8			0.031	0.008	< 0.026					clear		94									
Awbeg	Br in Castletownroche				WFD Oper	2008/1496	17-Jul-08	10:30		13.9	9.7			0.028	*0.041*	< 0.026	13.4						93									
Awbeg	Br in Castletownroche				Phosphate	2008/2040	28-Aug-08	10:10		14.3	9.9	8.1		0.031	0.028	0.048					clear		95									
Awbeg	Br in Castletownroche				Phosphate	2008/2267	17-Sep-08	09:55		11.7	10.3			0.026	*0.031*	0.026					clear		95									
Awbeg	Br in Castletownroche				Phosphate	2008/2714	15-Oct-08	10:35		11	10.2			0.041	*0.035*	< 0.026							93									
Awbeg	Br in Castletownroche				Phosphate	2008/3112	19-Nov-08	12:20				8.2		0.025	0.024	0.037	14.97										474					
Awbeg	Br in Castletownroche				Phosphate	2008/3481	17-Dec-08	10:55		7.4	14.5			0.032	0.027	0.036	14.75				clear		121									
									Sample Cour	6	6	2	0	7	7	7	3	0	0	0	-	0	6	0	0	0	1	0	0	0	-	0
									Maximum	14.3	14.5	8.2		0.041	0.041	0.048	14.97				-		121				474				-	
									Minimum	7.4	9.7	8.1		0.025	0.008	< 0.026	13.4				-		93				474				-	
									Mean	11.9	10.7	8.15		0.031	0.028	0.027	14.4				-		98.5				474				-	
									Median	12.2	10	8.15		0.031	0.028	0.026	14.8				-		94.5				474				-	
									Std. Deviatio	2.52	1.86	0.071		0.005	0.01	0.014	0.851				-		11.1				0				-	
Awbeg	Buttevant E	RS18A050	154422	109305	Phosphate	2008/2858	22-Oct-08	11:35		9.3	8.8			0.042	*0.031*	0.032	9.91				clear		77									
									Sample Cour	1	1	0	0	1	1	1	1	0	0	0	-	0	1	0	0	0	0	0	0	0	-	0
									Maximum	9.3	8.8			0.042	0.031	0.032	9.91				-		77								-	
									Minimum	9.3	8.8			0.042	0.031	0.032	9.91				-		77								-	
									Mean	9.3	8.8			0.042	0.031	0.032	9.91				-		77								-	
									Median	9.3	8.8			0.042	0.031	0.032	9.91				-		77								-	
									Std. Deviatio	0	0			0	0	0	0				-		0								-	
Awbeg	Cahermee	RS18A050	156714.2	108220.9	WFD Oper	2008/0633	10-Apr-08	10:20		8.6	12.1	8	0.2	0.027	0.007	< 0.026	16.1		276	252		22.2	107			17	507					
Awbeg	Cahermee	RS18A050	156714.2	108220.9	WFD Oper	2008/1186	11-Jun-08	09:55		15.3	7.4	7.7	0.1	0.044	*0.038*	0.052	13		276	264	clear	20.9	72				517					
Awbeg	Cahermee	RS18A050	156714.2	108220.9	WFD Oper	2008/2174	10-Sep-08	10:25		12.8	7.1	7.6	1.4	*0.051*	*0.054*	0.062	5.3		158	160	good	16.1	68			106	338					
Awbeg	Cahermee	RS18A050	156714.2	108220.9	WFD Oper	2008/2851	22-Oct-08	11:20		9.2	9.4	7.9	1.1	0.037	0.029	0.035	11.6		252	234	clear	19.5	92			43	470					
									Sample Cour	4	4	4	4	4	4	4	4	0	4	4	-	4	4	0	0	3	4	0	0	0	-	0
									Maximum	15.3	12.1	8	1.4	0.051	0.054	0.062	16.1		276	264	-	22.2	107			106	517				-	
									Minimum	8.6	7.1	7.6	0.1	0.027	0.007	< 0.026	5.3		158	160	-	16.1	68			17	338				-	
									Mean	11.5	9	7.8	0.7	0.04	0.032	0.04	11.5		240	228	-	19.7	84.8			55.3	458				-	
									Median	11	8.4	7.8	0.65	0.04	0.034	0.044	12.3		264	243	-	20.2	82			43	488				-	
									Std. Deviatio	3.15	2.31	0.183	0.648	0.01	0.02	0.024	4.54		56.2	46.7	-	2.63	18.2			45.8	82.5				-	
Awbeg	Doneraile E	RS18A051	160360	107510	WFD Oper	2008/0634	10-Apr-08	09:55		8.2	11.2	8	0.1	0.021	0.007	0.031	16.8		270	244		22.2	99			22	502					
Awbeg	Doneraile E	RS18A051	160360	107510	WFD Oper	2008/1184	11-Jun-08	09:35		14.5	8.9	7.9	< 0.1	0.035	0.03	0.107	14.6		274	270	clear	21.1	91				519					
Awbeg	Doneraile E	RS18A051	160360	107510	Phosphate	2008/1185	11-Jun-08	09:20		14.4	8.8			0.028	0.022	0.037					clear		86									
Awbeg	Doneraile E	RS18A051	160360	107510	WFD Oper	2008/2175	10-Sep-08	10:00		12.6	8.4	7.7	1.3	0.043	*0.046*	0.039	6.5		58	168	good	17.1	83			109	347					
Awbeg	Doneraile E	RS18A051	160360	107510	WFD Oper	2008/2852	22-Oct-08	11:00		9	10	8	1.2	0.044	0.028	0.064	12.7		244	226	clear	19.6	87			38	466					
									Sample Cour	5	5	4	4	5	5	5	4	0	4	4	-	4	5	0	0	3	4	0	0	0	-	0
									Maximum	14.5	11.2	8	1.3	0.044	0.046	0.107	16.8		274	270	-	22.2	99			109	519				-	
									Minimum	8.2	8.4	7.7	< 0.1	0.021	0.007	0.031	6.5		58	168	-	17.1	83			22	347				-	
									Mean	11.7	9.46	7.9	0.663	0.034	0.027	0.056	12.6		212	227	-	20	89.2			56.3	458				-	
									Median	12.6	8.9	7.95	0.65	0.035	0.028	0.039	13.6		257	235	-	20.4	87			38	484				-	
									Std. Deviatio	2.98	1.14	0.141	0.68	0.01	0.014	0.031	4.43		103	43.3	-	2.21	6.18			46.3	77.6				-	
Awbeg	Doneraile u/s SW				Phosphate	2008/2857	22-Oct-08	10:55		9	9.5			0.041	0.028	0.054	12.62				clear		82									
									Sample Cour	1	1	0	0	1	1	1	1	0	0	0	-	0	1	0	0	0	0	0	0	0	-	0
									Maximum	9	9.5			0.041	0.028	0.054	12.62				-		82								-	
									Minimum	9	9.5			0.041	0.028	0.054	12.62				-		82								-	
									Mean	9	9.5			0.041	0.028	0.054	12.6				-		82								-	
									Median	9	9.5			0.041	0.028	0.054	12.6				-		82								-	
									Std. Deviatio	0	0			0	0	0	0				-		0								-	
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/0090	16-Jan-08	12:30		7.4	10.6	7.9	1.3	*0.055*	0.006	0.042	17.5		212	182	turbid	21.6	91			54	411					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/0317	28-Feb-08	12:35		8.7	11.3	8.2	0.4	0.03	0.022	0.034	20.5		296	142	clear		97			19	512	9.3	103			
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/0511	27-Mar-08	12:30		8.5	11.5	8.6	0.1	0.02	0.014	< 0.026	19.1		268	240			100			13	496					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/0750	24-Apr-08	10:45		10.5	11.4	8.1	0.3	0.017	0.012	< 0.026			276	244	clear	22.2	103				510					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/1015	21-May-08	10:30		11.9	10.6	8.1	0.1	0.021	0.01	0.029	3.9		259	250		20.6	99	1			516					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/1238	18-Jun-08	10:30		12.7	9.9	8.1	4.9	0.029	< 0.006	0.028	17.9		278	260	clear	22.1	94				522					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/1497	17-Jul-08	10:45		14.2	9.7	8.1	0.3	0.029	0.043	< 0.026	14		247	240		18.9	94				469					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/2038	28-Aug-08	10:25		14.5	9.9	8.1	0.5	0.028	0.03	0.026	13		254	232	clear	17.4	96			27	473					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Oper	2008/2265	17-Sep-08	10:30		11.9	10.3	8.1	0.9	0.025	0.028	< 0.026	12.2		235	222	clear	19	94			49	446					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/2712	15-Oct-08	10:50		11.2	10.4	7.8	1.5	0.041	0.038	0.033	8.8		163	152		15.5	95			214	319					
Awbeg	Kilcummer	RS18A051	169082.9	100496.1	WFD Surv	2008/3111	19-Nov-08	12:15				8.2	0.5	0.029	0.025	0.027	15.5		210	236		19.6				25	475					
									Sample Cour	10	10	11	11	11	11	11	10	0	11	11	-	9	10	1	0	7	11	1	1	0	-	0
									Maximum	14.5	11.5	8.6	4.9	0.055	0.043	0.042	20.5		296	260	-	22.2	103	1		214	522	9.3	103		-	
									Minimum	7.4	9.7	7.8	0.1	0.017	< 0.006	< 0.026	3.9		163	142	-	15.5	91	1		13	319	9.3	103		-	
									Mean	11.2	10.6	8.12	0.982	0.029	0.021	0.025	14.2		245	218	-	19.7	96.3	1		57.3	468	9.3	103		-	
									Median	11.6	10.5	8.1	0.5	0.029	0.022	0.027	14.8		254	236	-	19.6	95.5	1		27	475	9.3	103		-	
									Std. Deviatio	2.39	0.655	0.199	1.38	0.011	0.013	0.01	5.06		38.2	40.5	-	2.25	3.53	0		70.7	59.8	0	0		-	

SITE SYNOPSIS

SITE NAME: BLACKWATER RIVER (CORK/WATERFORD)

SITE CODE: 002170

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which includes the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The extent of the Blackwater and its tributaries in this site, flows through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Towns along, but not in the site, include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The Blackwater rises in boggy land of east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeraghs before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

The site is a candidate SAC selected for alluvial wet woodlands and Yew wood, both priority habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for floating river vegetation, estuaries, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, perennial vegetation of stony banks and old Oak woodlands, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter and the plant, Killarney Fern.

Wet woodlands are found where river embankments, particularly on the River Bride, have broken down and where the channel edges in the steep-sided valley between Cappoquin and Youghal are subject to daily inundation. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almond-leaved Willow (*Salix alba* and *S. triandra*) with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Grey Willow (*S. cinerea*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder Rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland, a rare habitat in Ireland and the EU, occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore, Beech and Douglas Fir (*Pseudotsuga menzsisii*). However, the future prospect for this Yew wood is good as the site is proposed for restoration under a Coillte EU Life Programme. Owing to its rarity, Yew woodland is listed with priority status on Annex I of the EU Habitats Directive.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh Marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Marsh Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*).

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the watertable and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed about with Grey Willows, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*) with locally abundant Starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio palustris*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive and includes Pond Water-crowfoot (*Ranunculus peltatus*), Water-crowfoot (*Ranunculus* spp.), Canadian Pondweed (*Elodea canadensis*), Broad-leaved Pondweed (*Potamogeton natans*), Pondweed (*Potamogeton* spp.), Water Milfoil (*Myriophyllum* spp.), Common Club-rush (*Scirpus*

lacustris), Water-starwort (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Water-dropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica*.

The grassland adjacent to the rivers of the site is generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow-flag (*Iris pseudacorus),* Meadow-sweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech (*Fagus sylvatica*) and a few conifers, and sometimes of Rhododendron (*Rhododendron ponticum*) and Laurel. Oak woodland is well developed on sandstone about Ballinatray, with the acid Oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Greater Woodrush (*Luzula sylvatica*) and Buckler Ferns (*Dryopteris affinis, D. aemula*) occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west but there are many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of Oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the Oak on the shallower slopes and here both Rhododendron and Cherry Laurel (*Prunus laurocerasus*) have invaded the woodland.

The Oak wood community in the Lismore and Glenmore valleys is of the classical upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Greater Woodrush, Bluebell (*Hyacinthoides non-scripta*), Wood Sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), Buckler Ferns (*D. dilatata, D. aemula*) and Lady Fern (*Athyrium felix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum, Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich with Pignut (*Conopodium majus*), Wild Garlic (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederae*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore (*Acer pseudoplatanus*), Ash and Horse-chestnut (*Aesculus hippocastanum*). In places the alien invasive species, Cherry Laurel, dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaea*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*).

In places along the upper Bride, scrubby, semi-natural deciduous woodland of Willow, Oak and Rowan occurs with abundant Great Woodrush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*) and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Marsh Orchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's Nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and Shield Fern occur. There is some Wild Garlic, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle in wet places. A Hazel stand at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow (*Salix cinerea* subsp. *oleifoila*) and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the other Habitats Directive Annex I habitats within it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site with the best examples at Kinsalebeg in Co. Waterford and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater and large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green algae (filamentous, *Ulva* species and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Sea-spurrey (*Spergularia media*), Glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser - at the edges. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch-grass (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include Lavender (*Limonium* spp.), Sea Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvy-grass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris*), Curled Dock (*Rumex crispus*) and Yellow-horned Poppy (*Glaucium flavum*) occur with at a slightly higher level Sea Mayweed (*Tripleurospermum maritimum*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb Robert (*Geranium robertianum*), Red Fescue (*Festuca rubra*) and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and includes lichens and bryophytes (including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*).

The site supports several Red Data Book plant species, i.e. Starved Wood Sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis,* Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the

Flora (Protection) Order 1999. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Campion (*Silene dioica*), Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl-mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers.

The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by mighty pools, lovely streams, glides and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is very highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, are to be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket, *Metrioptera roselii* (Orthoptera: Tettigoniidae), has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 35, 1994/95-95/96) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater Estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute max. 2141, 1994/95). Staging Terns visit the site annually (Sandwich Tern (>300) and Arctic/Common Tern (>200), average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland White-fronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at

least 30 pairs of Kingfisher. Little Egret now breed at the site (12 pairs in 1997, 19 pairs in 1998) and this represents about 90% of the breeding population in Ireland.

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2752), Teal (average peak 1316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1680), Knot (150), Dunlin (2293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig Estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers - 2 or 3 pairs at Dromana Rock; *c*. 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and *c*. 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in County Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it is known to nearby to the south of Youghal. Dipper occurs on the rivers.

Landuse at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries and there are a number of Angler Associations, some with a number of

beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, overgrazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively; furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

13.09.2006

Cork County

Water Services Investment Programme 2007 - 2009

Schemes at Construction	W/S	Est. Cost
Cork North		
Mitchelstown Sewerage Scheme (Nutrient Removal)	S	221,000
Cork South		
Ballyvourney/ Ballymakeery Sewerage Scheme	S	3,049,000
Cobh/ Midleton/ Carrigtwohill Water Supply Scheme	W	10,135,000
Cork Lower Harbour Sewerage Scheme (Crosshaven SS) (G)	S	4,850,000
Cork Water Strategy Study (G)	W	941,000
Kinsale Sewerage Scheme	S	20,000,000
Midleton Sewerage Scheme (Infiltration Reduction) (G)	S	2,078,000
		41,274,000

Schemes to start 2007		
Cork North		
North Cork Grouped DBO Wastewater Treatment Plant (Buttevant, Doneraile & Kilbrin)	S	5,150,000
Cork West		
Skibbereen Sewerage Scheme	S	20,000,000
		25,150,000

Schemes to start 2008		
Cork North		
Mallow/ Ballyviniter Regional Water Supply Scheme (H)	W	8,652,000
Mallow Sewerage Scheme (H)	S	5,408,000
Cork South		
Ballincollig Sewerage Scheme (Nutrient Removal) (G)	S	948,000
Ballingeary Sewerage Scheme	S	1,296,000
Bandon Sewerage Scheme Stage 2	S	14,729,000
City Environs (CASP) Strategic Study (G)	S	153,000
Cloghroe Sewerage Scheme (Upgrade)	S	683,000
Coachford Water Supply Scheme	W	1,318,000
Garrettstown Sewerage Scheme	S	2,153,000
Inniscarra Water Treatment Plant Extension Phase 1	W	2,678,000
Little Island Sewerage Scheme (G)	S	2,200,000
Cork West		
Bantry Sewerage Scheme	S	7,148,000
Dunmanway Sewerage Scheme	S	2,153,000
Leap/ Baltimore Water Supply Scheme	W	6,365,000
Schull Water Supply Scheme	W	5,253,000
		61,137,000

Schemes to start 2009		
Cork North		
Banteer/Dromahane Regional Water Supply Scheme	W	1,576,000
Conna Regional Water Supply Scheme Extension	W	2,627,000
Cork NE Water Supply Scheme	W	4,326,000
Cork NW Regional Water Supply Scheme	W	6,046,000
Millstreet Wastewater Treatment Plant (Upgrade)	S	1,628,000

Schemes to start 2009 contd.	W/S	Est. Cost
Cork South		
Ballincollig Sewerage Scheme (Upgrade) (G)	S	22,248,000
Cork Lower Harbour Sewerage Scheme (excl. Crosshaven SS)	S	73,542,000
Shannagarry/ Garryvoe/ Ballycotton Sewerage Scheme	S	3,780,000
Youghal Sewerage Scheme	S	14,420,000
Cork West		
Ballydehob Sewerage Scheme	S	683,000
Bantry Water Supply Scheme	W	14,935,000
Clonakilty Sewerage Scheme (Plant Capacity Increase)	S	3,677,000
Courtmacsherry/ Timoleague Sewerage Scheme	S	2,472,000
Dunmanway Regional Water Supply Scheme Stage 1	W	12,669,000
		164,629,000

Serviced Land Initiative		
Cork North		
Ballyclough Water Supply Scheme	W	139,000
Ballyhooley Improvement Scheme	W/S	139,000
Broghal-Rathgoggin Sewerage Scheme	S	406,000
Bweeng Water Supply Scheme	W	115,000
Churchtown Sewerage Scheme (incl. Water)	W/S	543,000
Clondulane Sewage Treatment Plant	S	417,000
Freemount Sewerage Scheme	S	150,000
Pike Road Sewerage Scheme (incl. Water)	W/S	2,080,000
Rathcormac Sewerage Scheme (incl. Water)	W/S	555,000
Spa Glen Sewerage Scheme	S	736,000
Uplands Fermoy Sewerage Scheme (incl. Water)	W/S	1,174,000
Watergrasshill Water Supply Scheme (incl. Sewerage) (G)	W/S	4,151,000
Cork South		
Ballincollig Sewerage Scheme (Barry's Rd Foul and Storm Drainage) (G)	S	1,164,000
Belgooley, Water Supply Scheme (incl. Sewerage)	W/S	2,913,000
Blarney Water Supply Scheme (Ext. to Station Rd) (G)	W	416,000
Carrigtwohill Sewerage Scheme (Treatment and Storm Drain) (G)	S	7,632,000
Castlematyr Wastewater Treatment Plant Extension	S	1,200,000
Crookstown Sewerage Scheme (incl. Water)	W/S	1,200,000
Dripsey Water Supply Scheme (incl. Sewerage)	W/S	1,112,000
Glounthane Sewerage Scheme (G)	S	1,576,000
Innishannon Sewerage Scheme	S	277,000
Innishannon Wastewater Treatment Plant	S	694,000
Kerrypike Sewerage Scheme	S	832,000
Kerrypike Water Supply Scheme	W	416,000
Killeagh Wastewater Treatment Plant Extension	S	1,200,000
Killeagh Water Supply Scheme (includes Sewerage)	W/S	485,000
Killeens Sewerage Scheme	S	420,000
Kilnagleary Sewerage Scheme	S	694,000
Midleton Wastewater Treatment Plant Extension	S	4,050,000

Cork County contd.

Water Services Investment Programme 2007 - 2009

Serviced Land Initiative contd.	W/S	Est. Cost
Cork South contd.		
Mogeely, Castlemartyr & Ladysbridge Water Supply Scheme	W	2,566,000
North Cobh Sewerage Scheme (G)	S	3,193,000
Riverstick Water Supply Scheme (incl. Sewerage)	W/S	525,000
Rochestown Water Supply Scheme	W	2,700,000
Saleen Sewerage Scheme	S	1,051,000
Youghal Water Supply Scheme	W	2,300,000
Cork West		
Castletownshend Sewerage Scheme	S	1,576,000
		50,797,000
Rural Towns & Villages Initiative		
Cork North		
Buttevant Sewerage Scheme (Collection System)	S	2,446,000
Doneraile Sewerage Scheme (Collection System)	S	1,738,000
Cork South		
Innishannon (Ballinadee/ Ballinspittle/ Garrettstown) Water Supply Scheme	W	6,726,000
Cork West		
Ballylicky Sewerage Scheme	S	2,153,000
Baltimore Sewerage Scheme	S	3,182,000
Castletownbere Sewerage Scheme	S	5,202,000
Schull Sewerage Scheme	S	3,523,000
		24,950,000
Schemes to Advance through Planning		
Cork North		
Mitchelstown North Galtees Water Supply Scheme	W	3,152,000
Mitchelstown Sewerage Scheme	S	3,000,000
Newmarket Sewerage Scheme	S	3,152,000

Schemes to Advance through Planning cond.	W/S	Est. Cost
Cork South		
Carrigtwohill Sewerage Scheme (G)	S	20,000,000
Cork Sludge Management (G)	S	14,420,000
Cork Water Supply Scheme (Storage - Mount Emla, Ballincollig & Chetwind) (G)	W	8,500,000
Inniscarra Water Treatment Plant (Sludge Treatment)(G)	W	5,356,000
Macroom Sewerage Scheme	S	5,150,000
Minane Bridge Water Supply Scheme	W	1,421,000
Cork West		
Bantry Regional Water Supply Scheme (Distribution)	W	9,455,000
Cape Clear Water Supply Scheme	W	1,679,000
Castletownbere Regional Water Supply Scheme	W	8,405,000
Glengarriff Sewerage Scheme	S	2,500,000
Roscarberry/Owenahincha Sewerage Scheme	S	1,576,000
Skibbereen Regional Water Supply Scheme Stage 4	W	7,880,000
		95,646,000
Water Conservation Allocation		**12,206,000**
Asset Management Study		**300,000**
South Western River Basin District (WFD) Project[1]		**9,400,000**
Programme Total		**485,489,000**

[1] This project is being led by Cork County Council on behalf of other authorities in the River Basin District

(H) Refers to a Hub as designated in the National Spatial Strategy

(G) Refers to a Gateway as designated in the National Spatial Strategy

SITE SYNOPSIS

SITE NAME: BLACKWATER RIVER (CORK/WATERFORD)

SITE CODE: 002170

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which includes the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The extent of the Blackwater and its tributaries in this site, flows through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Towns along, but not in the site, include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The Blackwater rises in boggy land of east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeraghs before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

The site is a candidate SAC selected for alluvial wet woodlands and Yew wood, both priority habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for floating river vegetation, estuaries, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, perennial vegetation of stony banks and old Oak woodlands, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter and the plant, Killarney Fern.

Wet woodlands are found where river embankments, particularly on the River Bride, have broken down and where the channel edges in the steep-sided valley between Cappoquin and Youghal are subject to daily inundation. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almond-leaved Willow (*Salix alba* and *S. triandra*) with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Grey Willow (*S. cinerea*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder Rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland, a rare habitat in Ireland and the EU, occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore, Beech and Douglas Fir (*Pseudotsuga menzsisii*). However, the future prospect for this Yew wood is good as the site is proposed for restoration under a Coillte EU Life Programme. Owing to its rarity, Yew woodland is listed with priority status on Annex I of the EU Habitats Directive.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh Marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Marsh Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*).

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the watertable and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed about with Grey Willows, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*) with locally abundant Starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio palustris*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive and includes Pond Water-crowfoot (*Ranunculus peltatus*), Water-crowfoot (*Ranunculus* spp.), Canadian Pondweed (*Elodea canadensis*), Broad-leaved Pondweed (*Potamogeton natans*), Pondweed (*Potamogeton* spp.), Water Milfoil (*Myriophyllum* spp.), Common Club-rush (*Scirpus*

lacustris), Water-starwort (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Water-dropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica*.

The grassland adjacent to the rivers of the site is generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow-flag (*Iris pseudacorus),* Meadow-sweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech (*Fagus sylvatica*) and a few conifers, and sometimes of Rhododendron (*Rhododendron ponticum*) and Laurel. Oak woodland is well developed on sandstone about Ballinatray, with the acid Oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Greater Woodrush (*Luzula sylvatica*) and Buckler Ferns (*Dryopteris affinis, D. aemula*) occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west but there are many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of Oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the Oak on the shallower slopes and here both Rhododendron and Cherry Laurel (*Prunus laurocerasus*) have invaded the woodland.

The Oak wood community in the Lismore and Glenmore valleys is of the classical upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Greater Woodrush, Bluebell (*Hyacinthoides non-scripta*), Wood Sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), Buckler Ferns (*D. dilatata, D. aemula*) and Lady Fern (*Athyrium felix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum, Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich with Pignut (*Conopodium majus*), Wild Garlic (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederae*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore (*Acer pseudoplatanus*), Ash and Horse-chestnut (*Aesculus hippocastanum*). In places the alien invasive species, Cherry Laurel, dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaea*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*).

In places along the upper Bride, scrubby, semi-natural deciduous woodland of Willow, Oak and Rowan occurs with abundant Great Woodrush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*) and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Marsh Orchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's Nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and Shield Fern occur. There is some Wild Garlic, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle in wet places. A Hazel stand at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow (*Salix cinerea* subsp. *oleifoila*) and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the other Habitats Directive Annex I habitats within it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site with the best examples at Kinsalebeg in Co. Waterford and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater and large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green algae (filamentous, *Ulva* species and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Sea-spurrey (*Spergularia media*), Glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser - at the edges. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch-grass (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include Lavender (*Limonium* spp.), Sea Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvy-grass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris*), Curled Dock (*Rumex crispus*) and Yellow-horned Poppy (*Glaucium flavum*) occur with at a slightly higher level Sea Mayweed (*Tripleurospermum maritimum*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb Robert (*Geranium robertianum*), Red Fescue (*Festuca rubra*) and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and includes lichens and bryophytes (including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*).

The site supports several Red Data Book plant species, i.e. Starved Wood Sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis,* Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the

Flora (Protection) Order 1999. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Campion (*Silene dioica*), Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl-mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers.

The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by mighty pools, lovely streams, glides and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is very highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, are to be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket, *Metrioptera roselii* (Orthoptera: Tettigoniidae), has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 35, 1994/95-95/96) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater Estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute max. 2141, 1994/95). Staging Terns visit the site annually (Sandwich Tern (>300) and Arctic/Common Tern (>200), average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland White-fronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at

least 30 pairs of Kingfisher. Little Egret now breed at the site (12 pairs in 1997, 19 pairs in 1998) and this represents about 90% of the breeding population in Ireland.

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2752), Teal (average peak 1316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1680), Knot (150), Dunlin (2293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig Estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers - 2 or 3 pairs at Dromana Rock; *c*. 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and *c*. 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in County Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it is known to nearby to the south of Youghal. Dipper occurs on the rivers.

Landuse at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries and there are a number of Angler Associations, some with a number of

beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, overgrazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively; furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

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