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**CONTENTS OF ATTACHMENTS**

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B.1 – Agglomeration Details ..... B.1-01

B.2 – Location of Waste Water Treatment Plant ..... B.2-01

B.3 – Location of Primary Discharge Point ..... B.3-01

B.4 – Location of Secondary Discharge Points ..... B.4-01

B.8 – Site Notice and Newspaper Advertisement ..... B.8-01

B.10 – Capital Investment Programme ..... B.10-01

C.1 – Operational Information Requirements ..... C.1-01

C.2 – Outfall Construction and Design ..... C.2-01

F.1 – Assessment on Impacts of Waste Water Discharges on Receiving waters ..... F.1-01

G.1 – Compliance With Compliance Directives ..... G.1-01

G.2 - Compliance with Water Quality Standards for Phosphorous Regulations ..... G.2-01

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**SECTION B1: APPLICANT'S DETAILS**

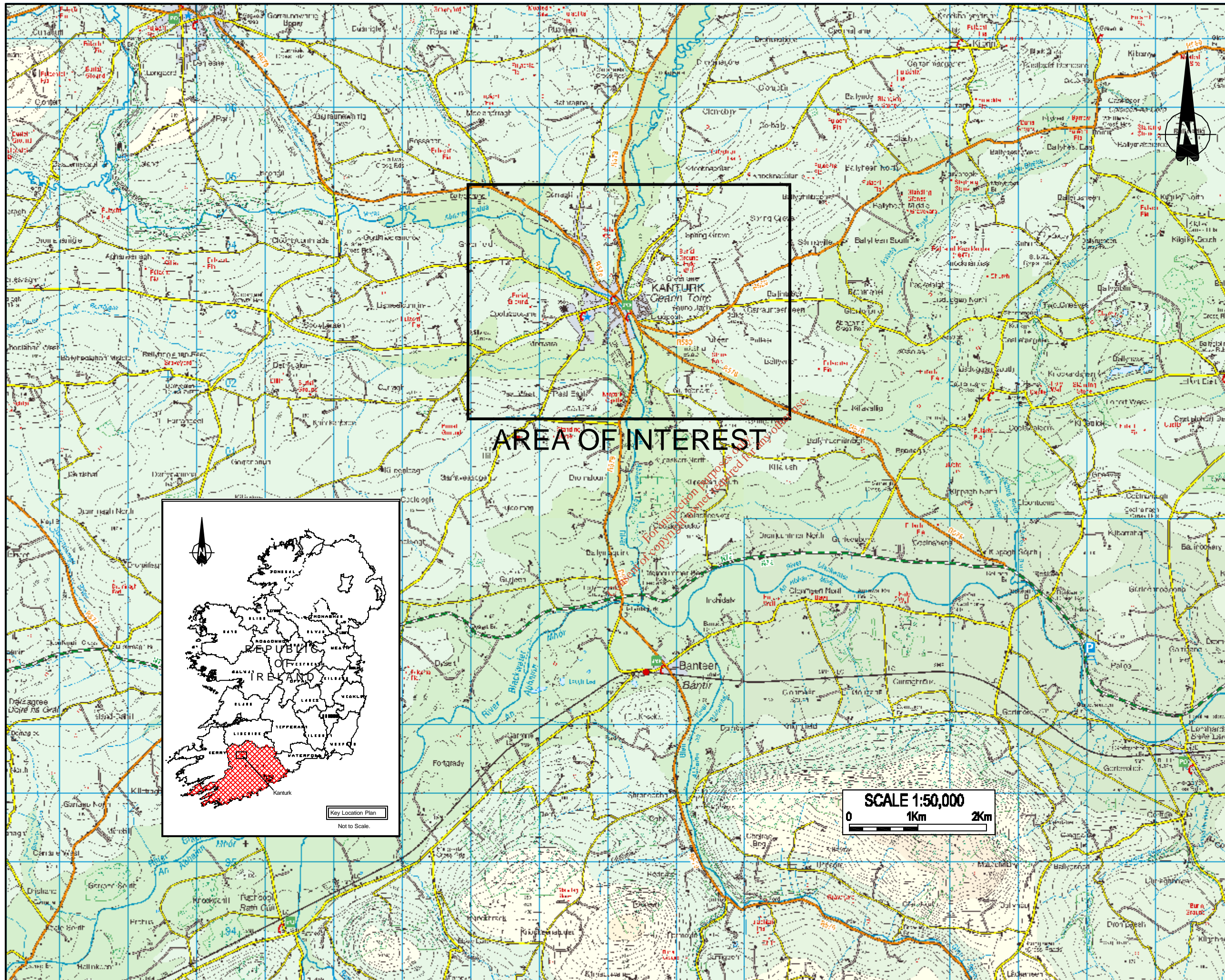
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This attachment contains a map showing the location of Kanturk. It also contains a drawing showing the agglomeration served by the Kanturk Wastewater Works. The agglomeration boundary is shown in red.

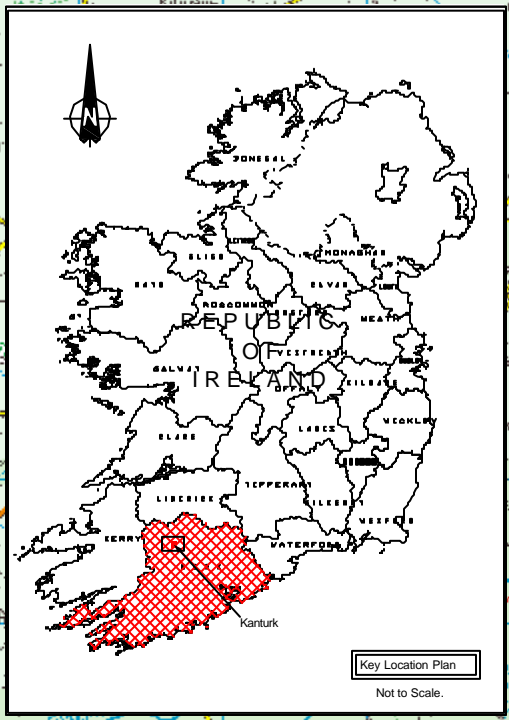
Table B1-1: Table of Attachments

Item	Title	Map. No.
1	1/50,000 Location Map	KTRK B1-01
2	1/10,000 Agglomeration Boundary Plan	KTRK B1-02

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**AREA OF INTEREST**

**SCALE 1:50,000**  
0 1Km 2Km

AD1	1/10/2011	Issue for Approval	1/1
No.	Date	Amendment/Issue	App.

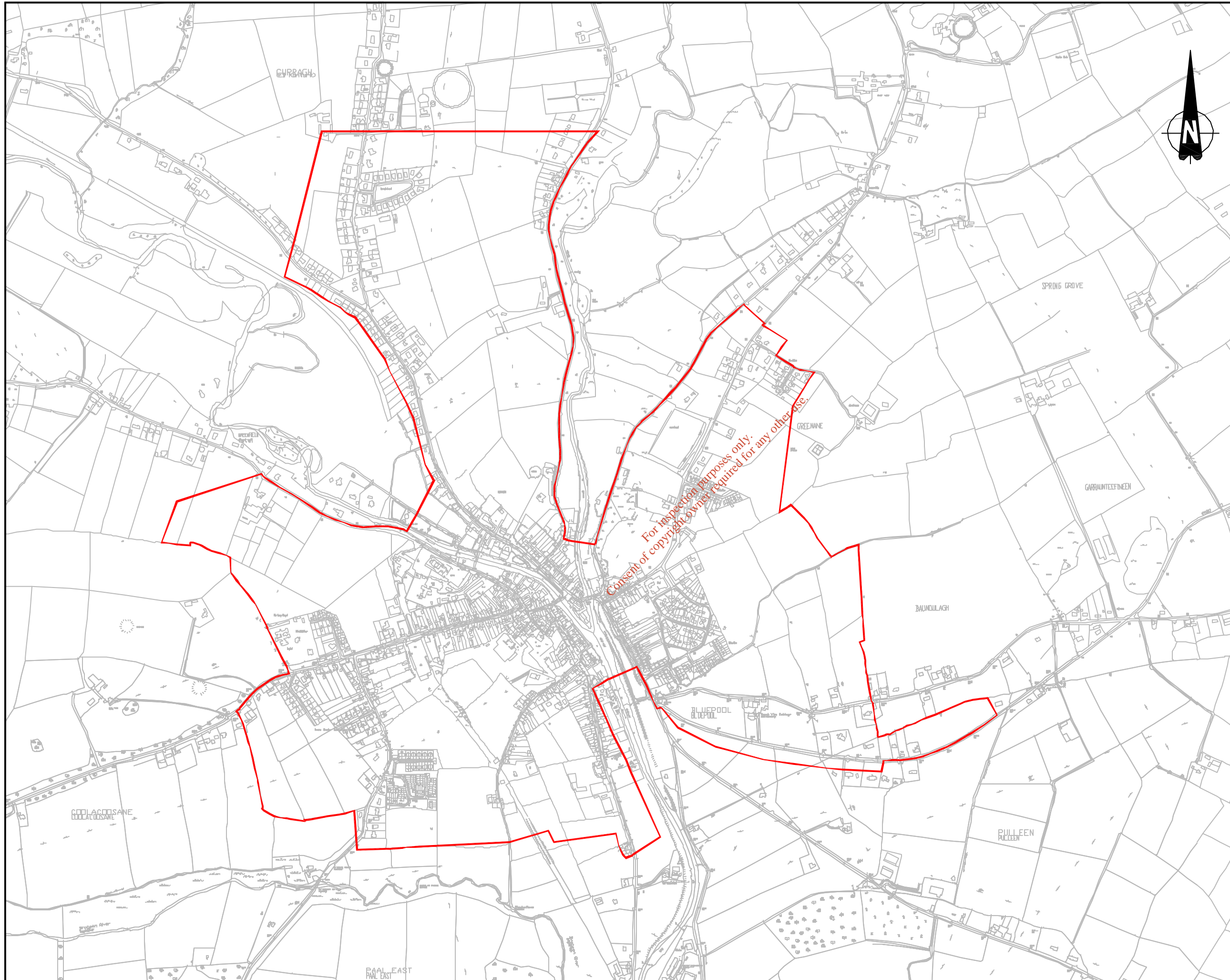
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**Kanturk and Environs  
Wastewater Discharge  
Licence Application**

**Attachment B1  
1 : 50,000 Location Map**


Drawn by:	BC/WH	Job No:	LC000048
Checked by:	CD	File No:	D06001
Approved by:	MB	Dep. No:	
Date:	1 / 10 / 2011	ICR/EC 014-01	Rev:
Date:	August 2010		<b>AD1</b>



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No.	Date	Amendment/Issue	App.
A01	July '08	Issue for Approval	BB

Client:  

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Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B1  
 1:10,000 Agglomeration  
 Boundary Plan**

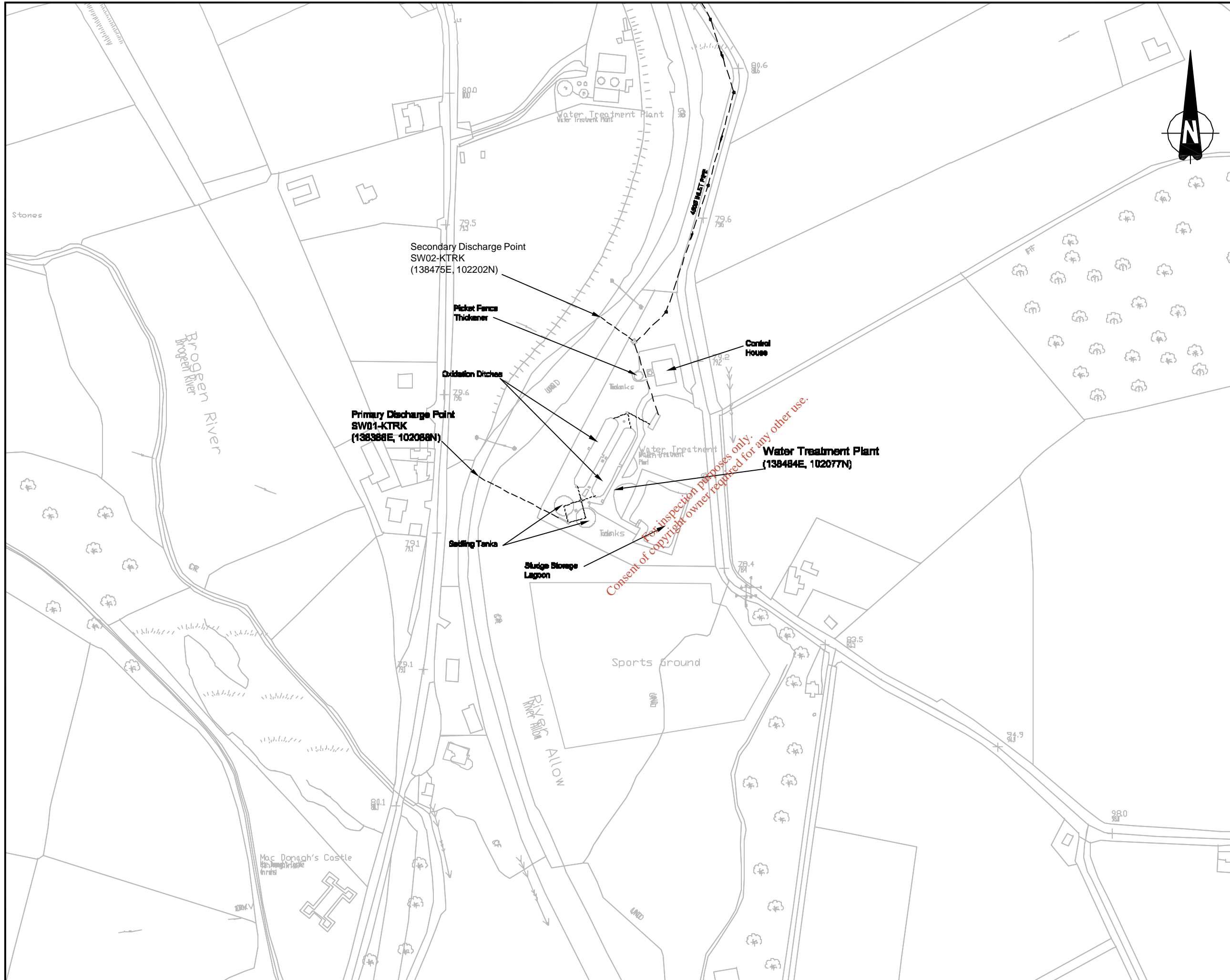
Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0002
Approved by:	BB	Org. No:	KTRK B1-02
Scale:	1/10000	Rev:	
Date:	July 2008		

**SECTION B2: Location of Associated Waste Water Treatment Plant**

Table B2-1: Table of Attachments

Item	Title	Drg. No.
1	1/2,500 Wastewater Treatment Plant Site Plan	KTRK B2-03

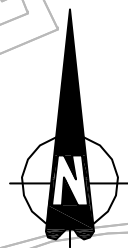
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Project:  
**Kanturk and Environs  
Wastewater Discharge  
Licence Application**

Title:  
**Attachment B2  
1:2500 Wastewater  
Treatment Plant Site Plan**

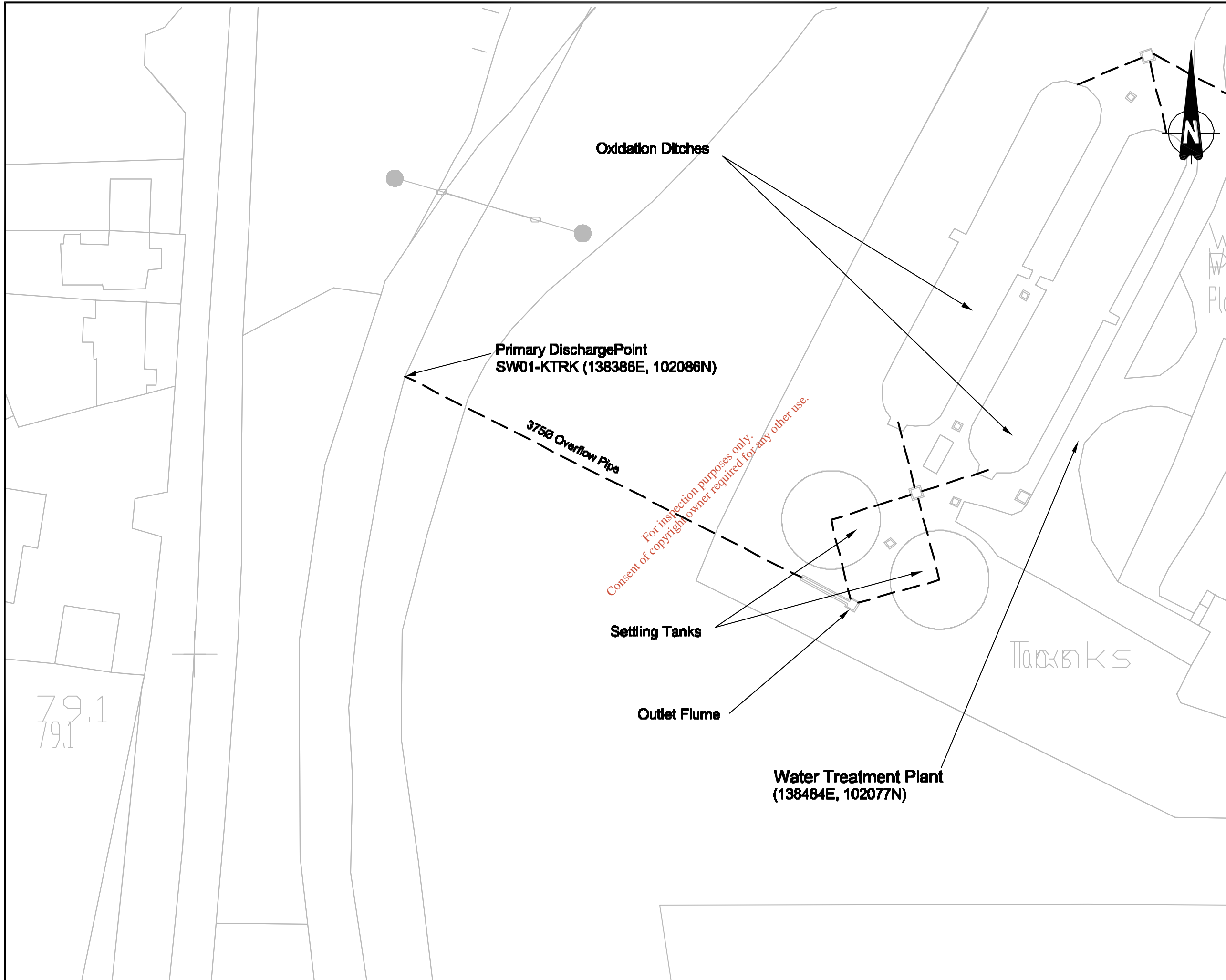
Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	Rev:
Scale:	1/2500	KTRK B2-03	A01
Date:	July 2008		

**SECTION B3: Location of Primary Discharge Point**

Table B3-1: Table of Attachments

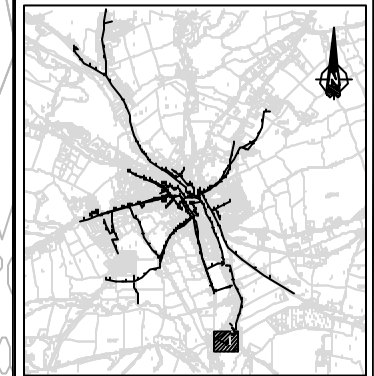
Item	Title	Drg. No.
1	1/500 Location Plan of Primary Discharge Point, SW01- KTRK	KTRK B3-04
2	1/10,000 Location Plan of all Discharge Points	KTRK B3-05
3	1/5000 Location Plan of Monitoring Point aSW1u- KTRK	KTRK B3-06
4	1/12500 Location Plan of Monitoring Point aSW1d- KTRK	KTRK B3-07

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**KEY PLAN**

No.	Date	Amendment/Issue	App.
AO1	July '08	Issue for Approval	BB

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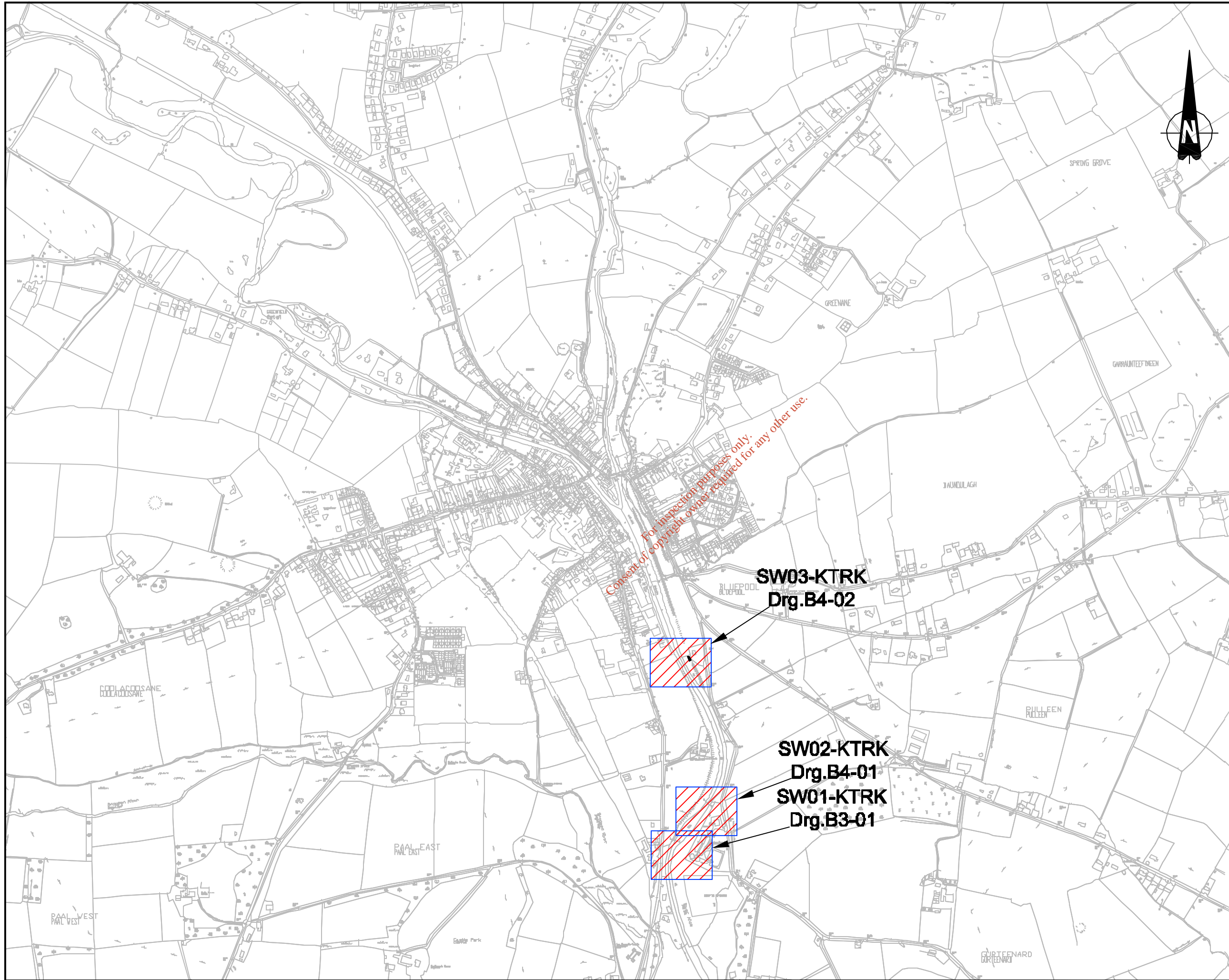
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 E: ireland@rpsgroup.com - W: www.rpsgroup.com/ireland

Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B3  
 1:500 Location Plan of Primary  
 Discharge Point, SW01-KTRK**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	KTRK B3-04
Scale:	1/500	Rev:	A01
Date:	July 2008		





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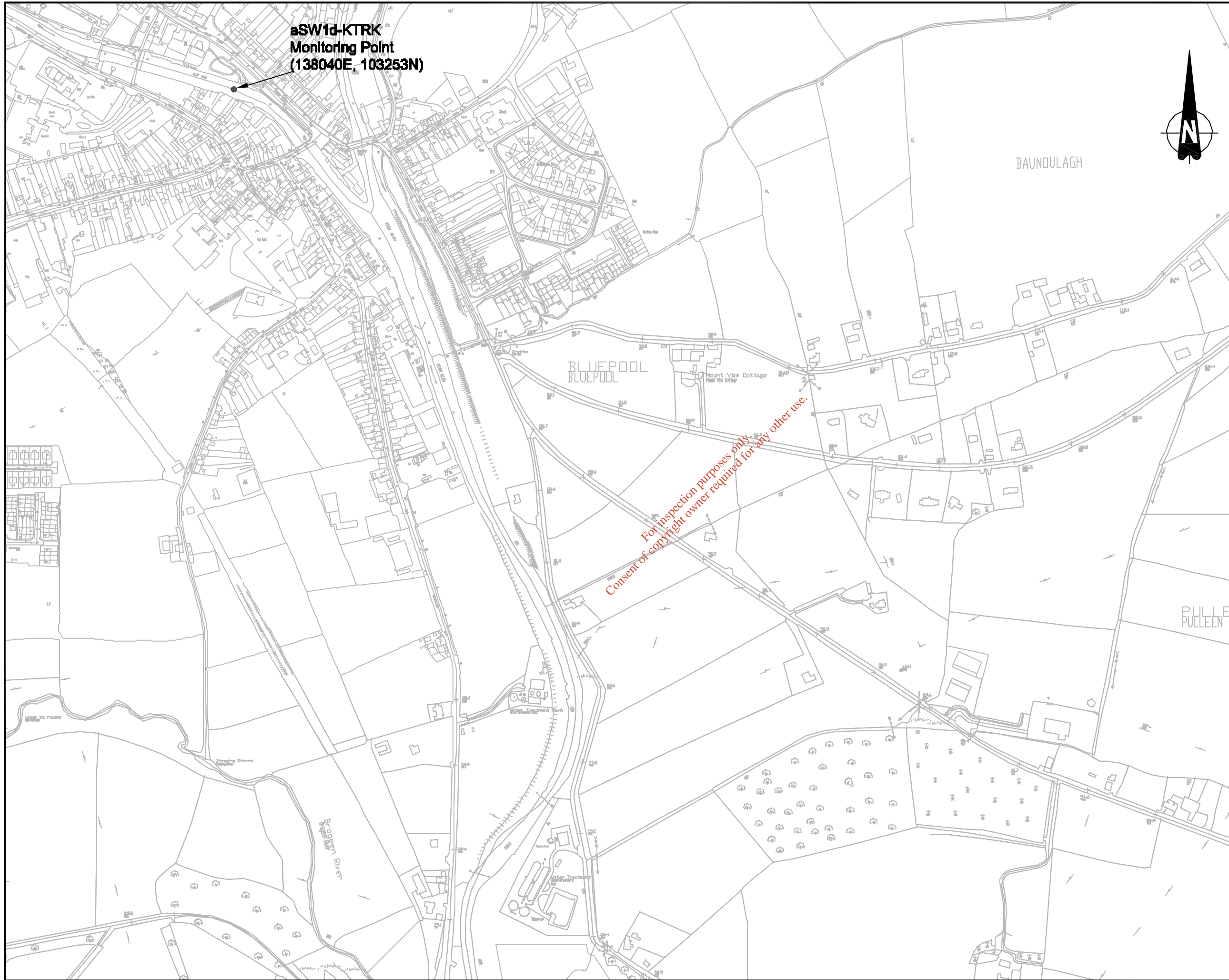
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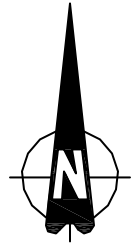
Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B3  
 1:10,000 Location Plan  
 of All Discharge Points**


Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Drg. No:	KTRK B3-05
Date:	July 2008	Rev:	A01



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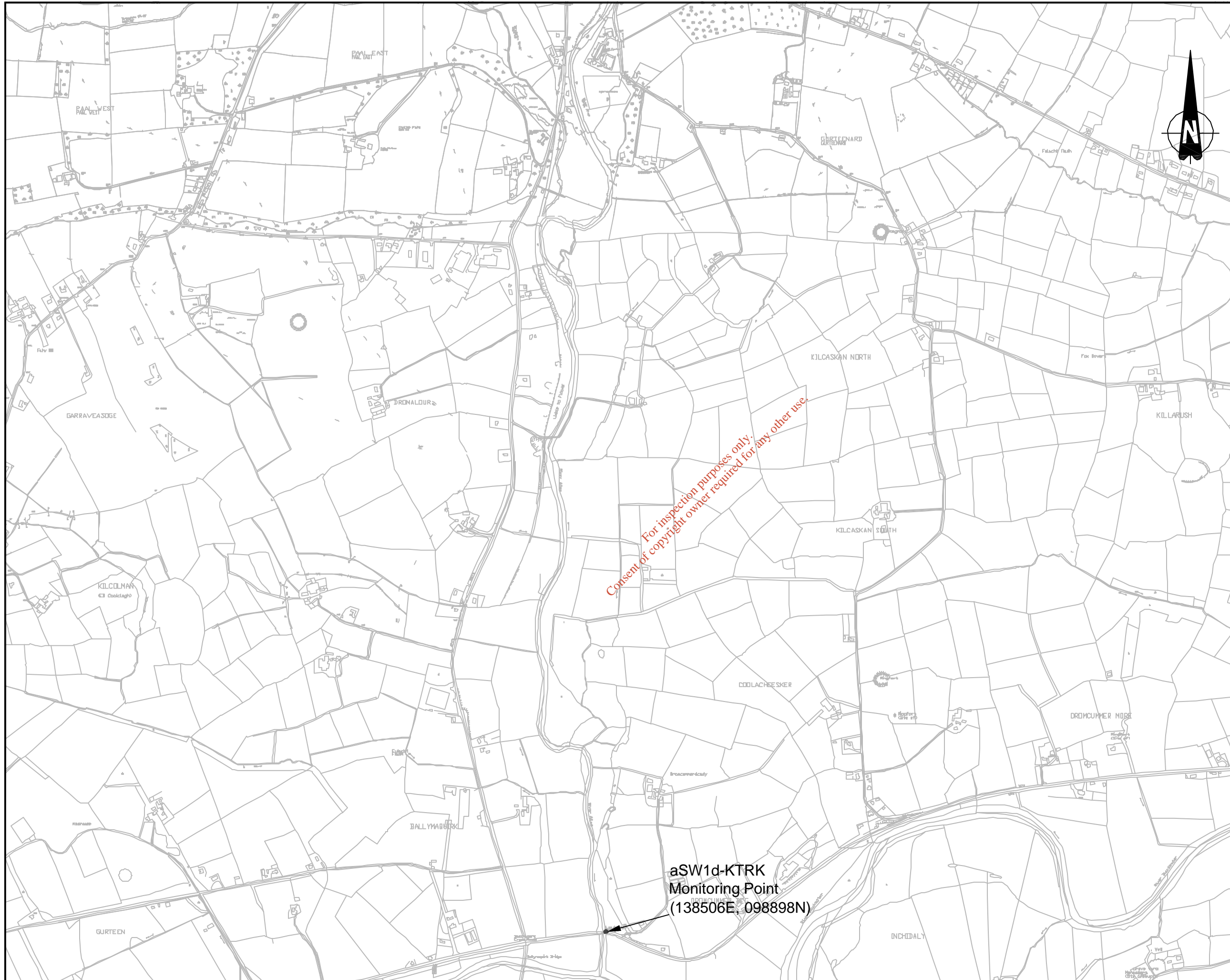
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Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B3  
 1:5000 Location Plan  
 of Monitoring Point  
 aSW1u-KTRK**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	KTRK B3-06
Scale:	1/5000	Rev:	
Date:	July 2008		



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A01	July '08	Issue for Approval	BB

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Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B3  
 1:12500 Location Plan  
 of Monitoring Point  
 aSW1d-KTRK**

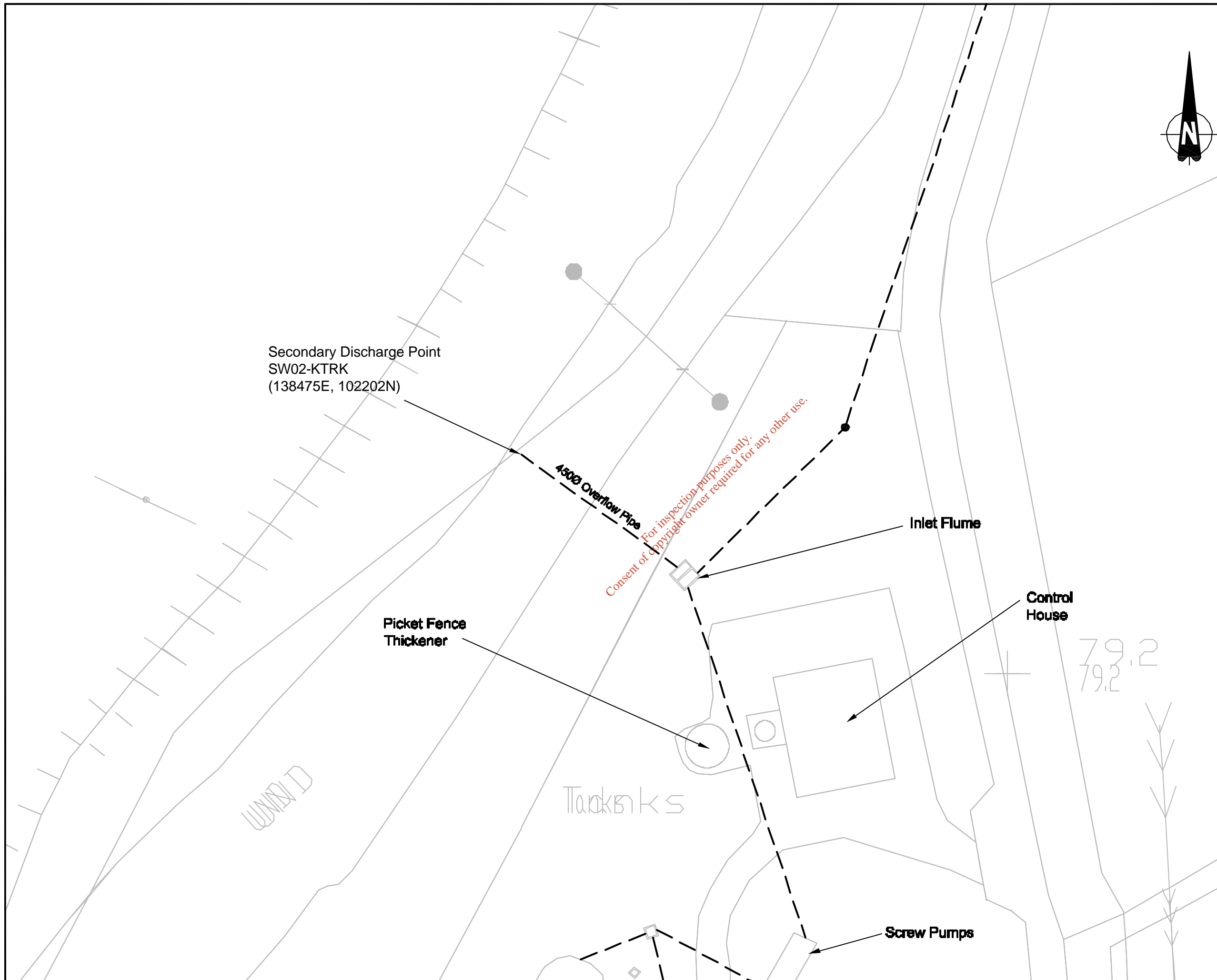
Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Dir. No:	KTRK B3-07
Scale:	1/12500	Rev:	A01
Date:	July 2008		

**SECTION B4: Location of Secondary Discharge Point(s)**

Table B4-1: Table of Attachments

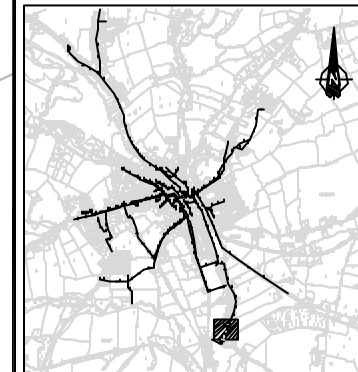
<b>Item</b>	<b>Title</b>	<b>Drg. No.</b>
1	1/500 Location Plan of Secondary Discharge Point, SW02-KTRK	KTRK B4-08
2	1/500 Location Plan of Secondary Discharge Point, SW03-KTRK	KTRK B4-09
3	1/10,000 Location Plan of all Discharge Points (Copy of drawing from Attachment B3)	KTRK B3-05

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KEY PLAN

No.	Date	Amendment/Issue	App.
AO1	July '08	Issue for Approval	BB

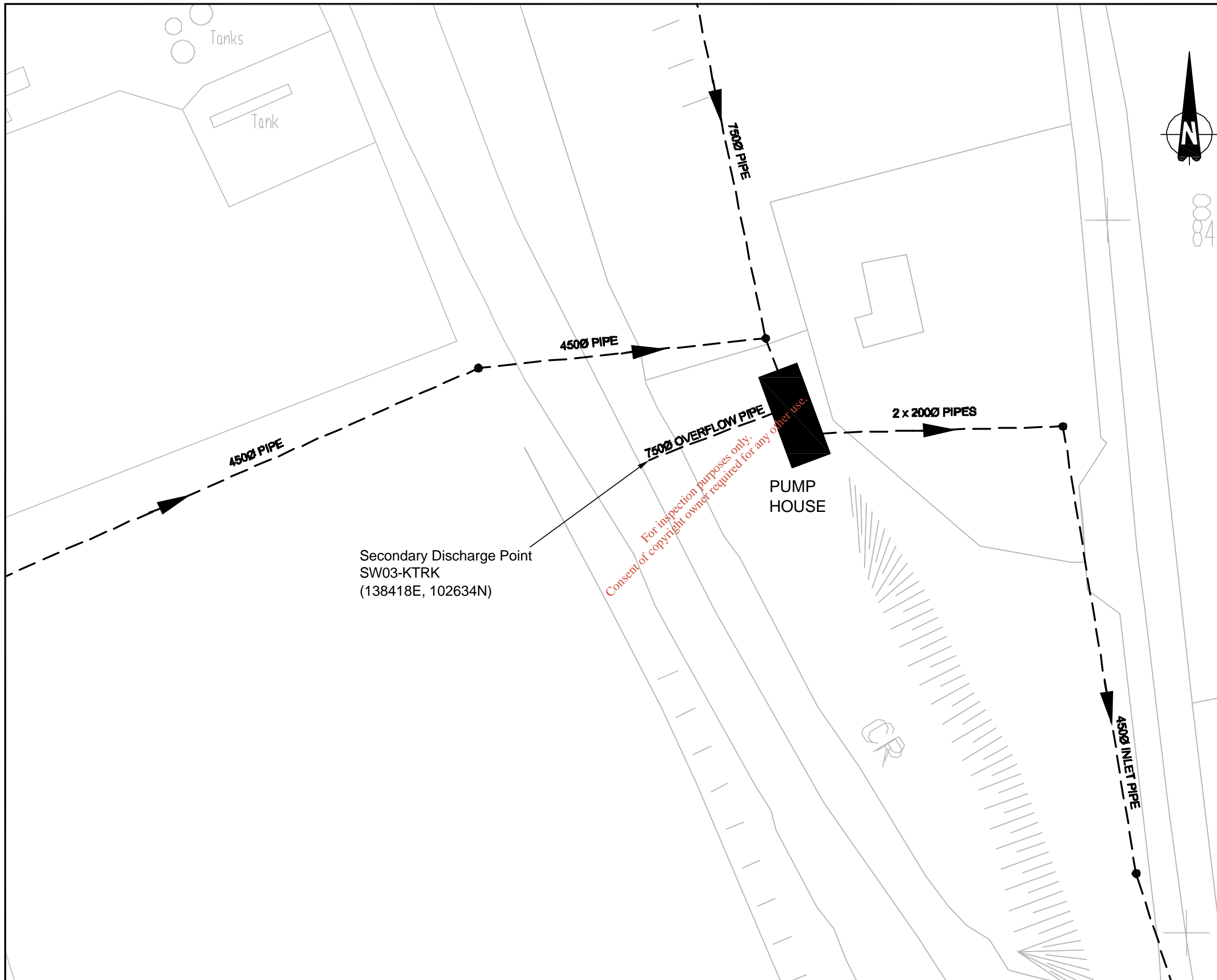
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Project:  
Kanturk and Environs  
Wastewater Discharge  
Licence Application

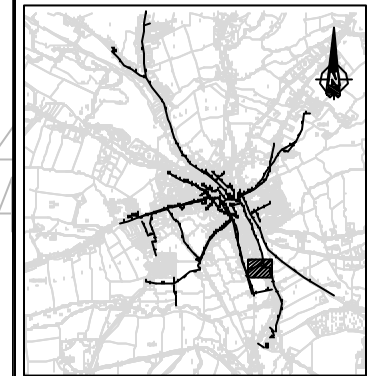
Title:  
Attachment B4  
1:500 Location Plan of Secondary  
Discharge Point, SW02-KTRK

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	KTRK B4-08
Scale:	1/500	Rev:	A01
Date:	July 2008		



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**KEY PLAN**

No.	Date	Amendment/Issue	App.
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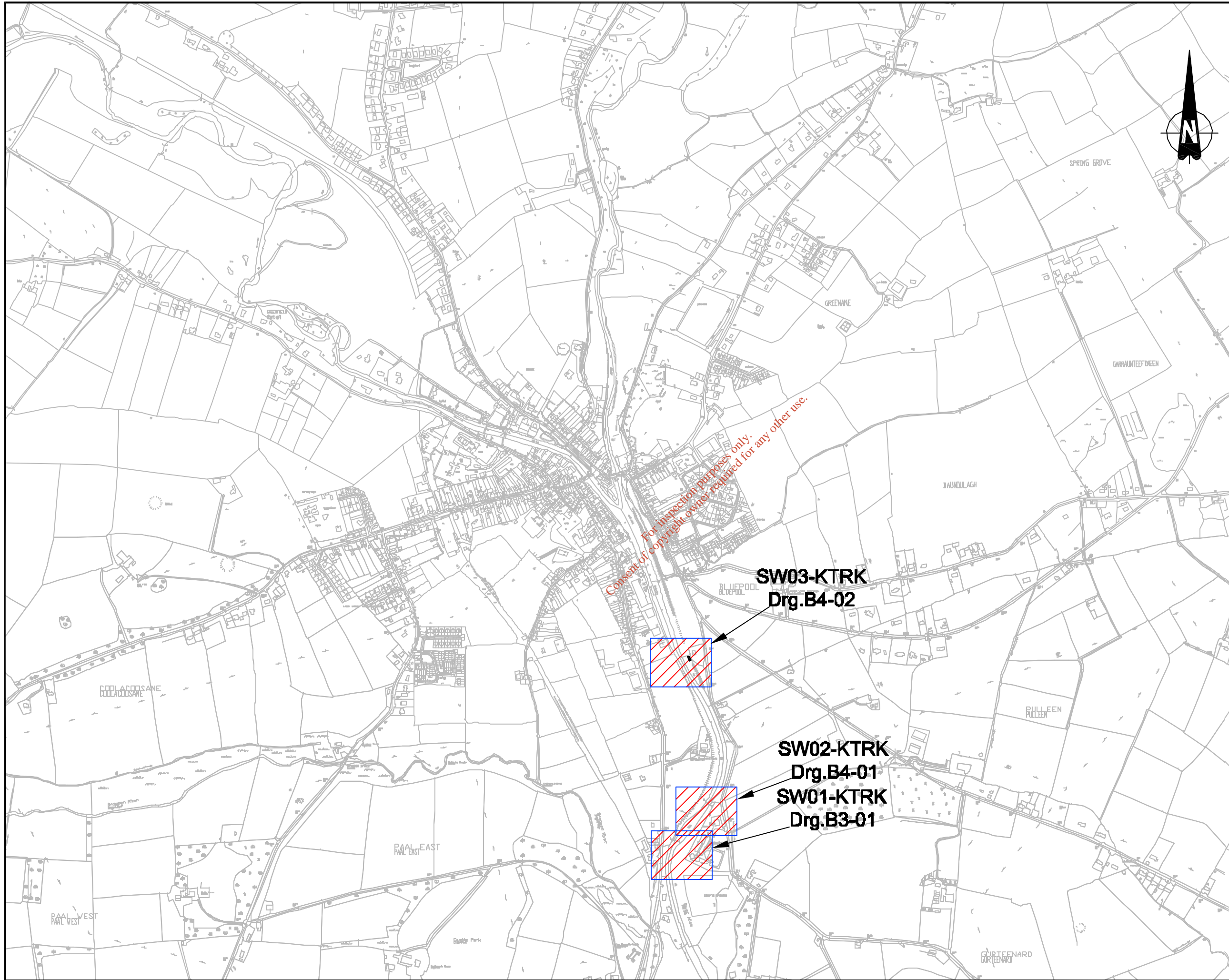
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Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B4  
 1:500 Location Plan of Secondary  
 Discharge Point SW03-KTRK**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	KTRK B4-09
Date:	July 2008	Rev:	A01



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Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B3  
 1:10,000 Location Plan  
 of All Discharge Points**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Drg. No:	KTRK B3-05
Date:	July 2008	Rev:	A01

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**SECTION B8: Notices and Advertisements**

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Table B8-1: Table of Attachments

Item	Title	Drg. No.
1	Newspaper Notice	Page No. B8-02
2	Site Notice	Page No. B8-03
3	1/5000 Map Showing Location of Site Notice	KTRK B8-10

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## 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 Kanturk at the following locations:

Plant Name	Location	National Grid Ref.
Kanturk WWTP	Gurteenard	E138505 N102077

Discharge	Function	Townland	Receptor	Grid Reference
Primary	Main	Gurteenard	River Allow	E138386 N102086
Secondary	Emergency	Gurteenard	River Allow	E138475 N102202
Secondary	Emergency	Gurteenard	River Allow	E138418 N102634

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: 023-21123 Fax: 023-21893.**

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



# 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 Kanturk at the following locations:

Plant Name	Location	National Grid Ref.
Kanturk WWTP	Gurteenard	E138505 N102077

Discharge	Function	Townland	Receptor	Grid Reference
Primary	Main	Gurteenard	River Allow	E138386 N102086
Secondary	Emergency	Gurteenard	River Allow	E138475 N102202
Secondary	Emergency	Gurteenard	River Allow	E138418 N102634

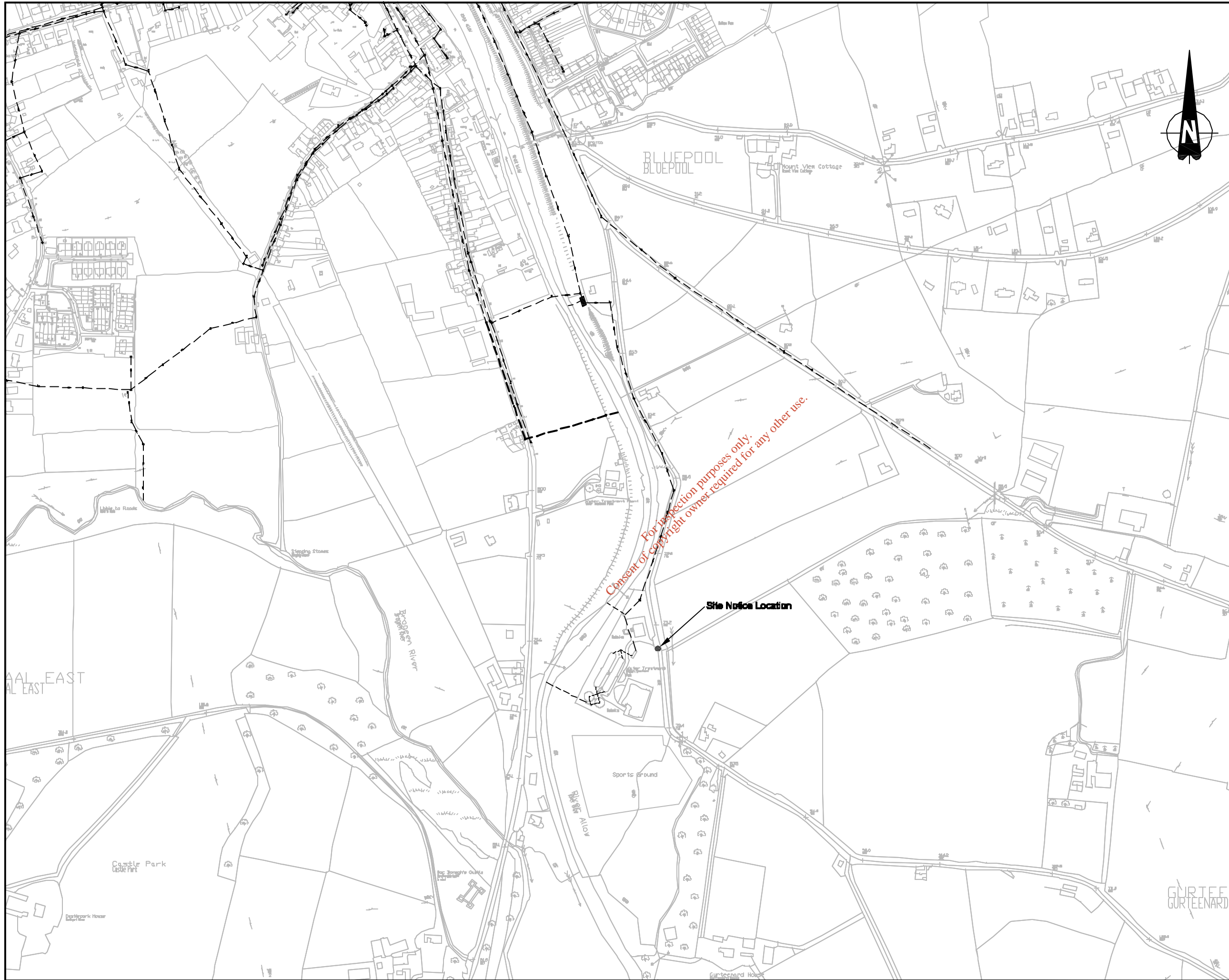
A copy of the application for the Waste Water Discharge Licence and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall as soon as is practicable after receipt by the Agency be available for inspection 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: 023-21123 Fax: 022-21983**

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



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 E: ireland@rpsgroup.com - W: www.rpsgroup.com/ireland

Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B8  
 1:5000 Map Showing  
 Location of Site Notice**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	KTRK B8-10
Scale:	1/5000	Rev:	A01
Date:	July 2008		

**SECTION B10: CAPITAL INVESTMENT PROGRAMME***Table B10-1: Table of Attachments*

<b>Item</b>	<b>Title</b>	<b>Page No.</b>
1	Extract from Water Services Investment Programme 2007 - 2009	Page No. B10-02

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# Cork County

## Water Services Investment Programme 2007 - 2009

Schemes at Construction	W/S	Est. Cost	Schemes to start 2009 contd.	W/S	Est. Cost
<b>Cork North</b>			<b>Cork South</b>		
Mitcheilstown Sewerage Scheme (Nutrient Removal)	S	221,000	Ballincollig Sewerage Scheme (Upgrade) (G)	S	22,248,000
<b>Cork South</b>			Cork Lower Harbour Sewerage Scheme (excl. Crosshaven SS)	S	73,542,000
Ballyvourney/ Ballymakeery Sewerage Scheme	S	3,049,000	Shannagarry/ Garryvoel/ Ballycotton Sewerage Scheme	S	3,780,000
Cobh/ Midleton/ Carrigtwohill Water Supply Scheme	W	10,135,000	Youghal Sewerage Scheme	S	14,420,000
Cork Lower Harbour Sewerage Scheme (Crosshaven SS) (G)	S	4,850,000	<b>Cork West</b>		
Cork Water Strategy Study (G)	W	941,000	Ballydehob Sewerage Scheme	S	683,000
Kinsale Sewerage Scheme	S	20,000,000	Bantry Water Supply Scheme	W	14,935,000
Midleton Sewerage Scheme (Infiltration Reduction) (G)	S	2,078,000	Clonakilly Sewerage Scheme (Plant Capacity Increase)	S	3,677,000
		<b>41,274,000</b>	Courtmacsherry/ Timoleague Sewerage Scheme	S	2,472,000
<b>Schemes to start 2007</b>			Dunmanway Regional Water Supply Scheme Stage 1	W	12,669,000
<b>Cork North</b>					<b>164,629,000</b>
North Cork Grouped DBO Wastewater Treatment Plant (Bulleivant, Doneraile & Kilbrin)	S	5,150,000	<b>Serviced Land Initiative</b>		
<b>Cork West</b>			<b>Cork North</b>		
Skibbereen Sewerage Scheme	S	20,000,000	Ballycotton Water Supply Scheme	W	139,000
		<b>25,150,000</b>	Ballycotton Improvement Scheme	W/S	139,000
<b>Schemes to start 2008</b>			Cloghroe Rathgoggin Sewerage Scheme	S	406,000
<b>Cork North</b>			Beeching Water Supply Scheme	W	115,000
Mallow/ Ballyvinter Regional Water Supply Scheme (H)	W	5,652,000	Churchtown Sewerage Scheme (incl. Water)	W/S	543,000
Mallow Sewerage Scheme (H)	S	5,408,000	Clonduane Sewage Treatment Plant	S	417,000
<b>Cork South</b>			Freemount Sewerage Scheme	S	150,000
Ballincollig Sewerage Scheme (Nutrient Removal) (G)	S	948,000	Pike Road Sewerage Scheme (incl. Water)	W/S	2,080,000
Ballingeary Sewerage Scheme	S	1,296,000	Rathcoormac Sewerage Scheme (incl. Water)	W/S	555,000
Bandon Sewerage Scheme Stage 2	S	14,729,000	Spa Glen Sewerage Scheme	S	736,000
City Environs (CASP) Strategic Study (G)	S	153,000	Uplands Fermoy Sewerage Scheme (incl. Water)	W/S	1,174,000
Cloghroe Sewerage Scheme (Upgrade)	S	683,000	Watergrasshill Water Supply Scheme (incl. Sewerage) (G)	W/S	4,151,000
Coachford Water Supply Scheme	W	1,318,000	<b>Cork South</b>		
Garretstown Sewerage Scheme	S	2,153,000	Ballincollig Sewerage Scheme (Barry's Rd Foul and Storm Drainage) (G)	S	1,164,000
Inniscarra Water Treatment Plant Extension Phase 1	W	2,678,000	Beigooley, Water Supply Scheme (incl. Sewerage)	W/S	2,913,000
Little Island Sewerage Scheme (G)	S	2,200,000	Blarney Water Supply Scheme (Ext. to Station Rd) (G)	W	416,000
<b>Cork West</b>			Carrigtwohill Sewerage Scheme (Treatment and Storm Drain) (G)	S	7,632,000
Bantry Sewerage Scheme	S	7,148,000	Castlemalyr Wastewater Treatment Plant Extension	S	1,200,000
Dunmanway Sewerage Scheme	S	2,153,000	Crookstown Sewerage Scheme (incl. Water)	W/S	1,200,000
Leap/ Baltimore Water Supply Scheme	W	6,365,000	Dripsey Water Supply Scheme (incl. Sewerage)	W/S	1,112,000
Schull Water Supply Scheme	W	5,253,000	Glounthane Sewerage Scheme (G)	S	1,576,000
		<b>61,137,000</b>	Innishannon Sewerage Scheme	S	277,000
<b>Schemes to start 2009</b>			Innishannon Wastewater Treatment Plant	S	694,000
<b>Cork North</b>			Kerypike Sewerage Scheme	S	832,000
Banteer/Dromahane Regional Water Supply Scheme	W	1,576,000	Kerypike Water Supply Scheme	W	416,000
Conna Regional Water Supply Scheme Extension	W	2,627,000	Killeagh Wastewater Treatment Plant Extension	S	1,200,000
Cork NE Water Supply Scheme	W	4,326,000	Killeagh Water Supply Scheme (includes Sewerage)	W/S	485,000
Cork NW Regional Water Supply Scheme	W	6,046,000	Killeens Sewerage Scheme	S	420,000
Millstreet Wastewater Treatment Plant (Upgrade)	S	1,628,000	Kilnagleary Sewerage Scheme	S	694,000
			Midleton Wastewater Treatment Plant Extension	S	4,050,000

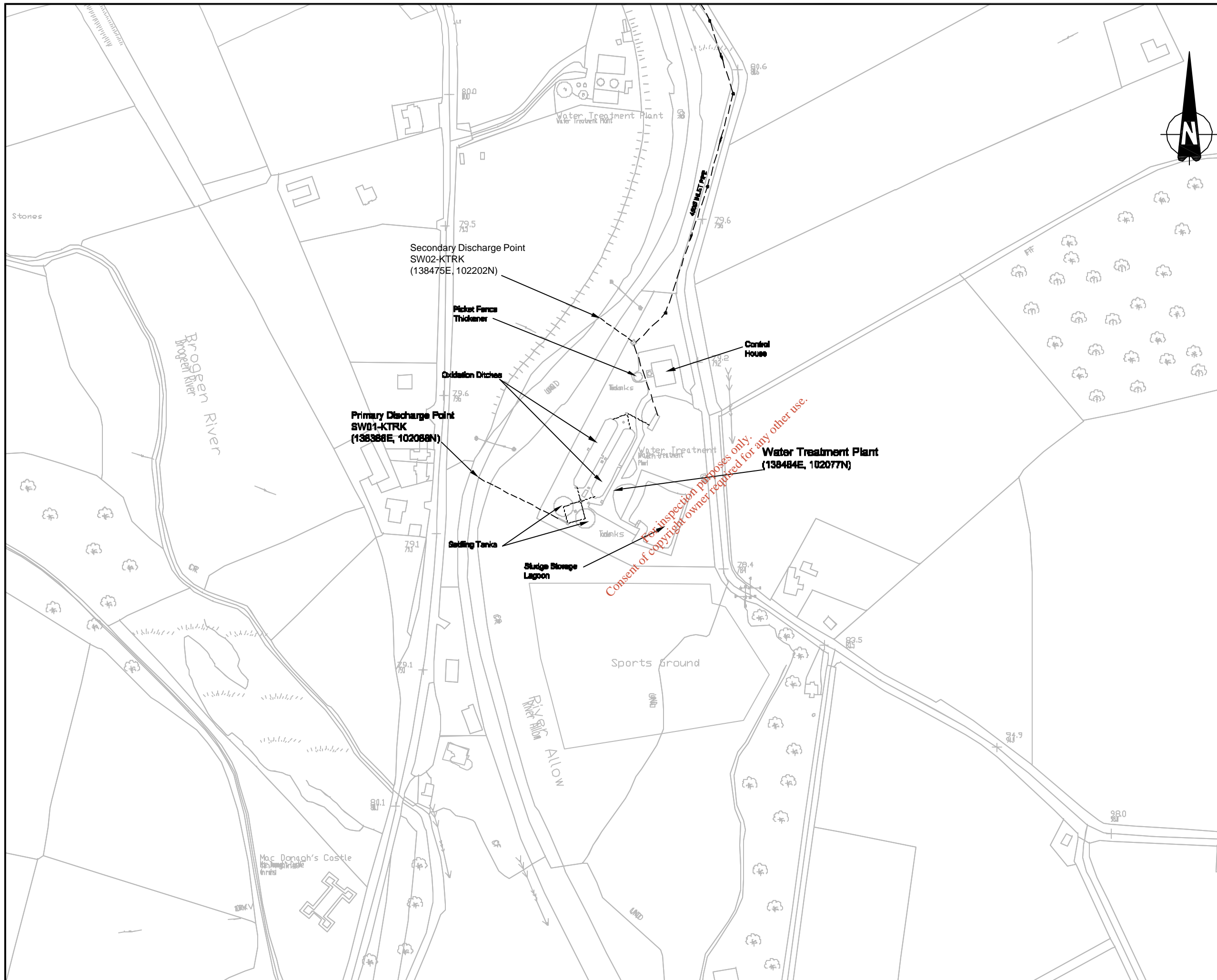
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## SECTION C1: OPERATIONAL INFORMATION REQUIREMENTS

Table C1-1: Table of Attachments

Item	Title	Drg. No.
1	1/2,500 Wastewater Treatment Plant Site Plan (Copy of drawing from Attachment B2)	KTRK B2-03
2	1/500 Location Plan of Primary Discharge Point, SW01KTRK (Copy of drawing from Attachment B3)	KTRK B3-04
3	Schematic Showing Treatment Plant Processes	KTRK C1-11
4	Details of pump station located 500m upstream of WWTP	KTRK C1-12

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No.	Date	Amendment/Issue	App.
A01	July '08	Issue for Approval	BB

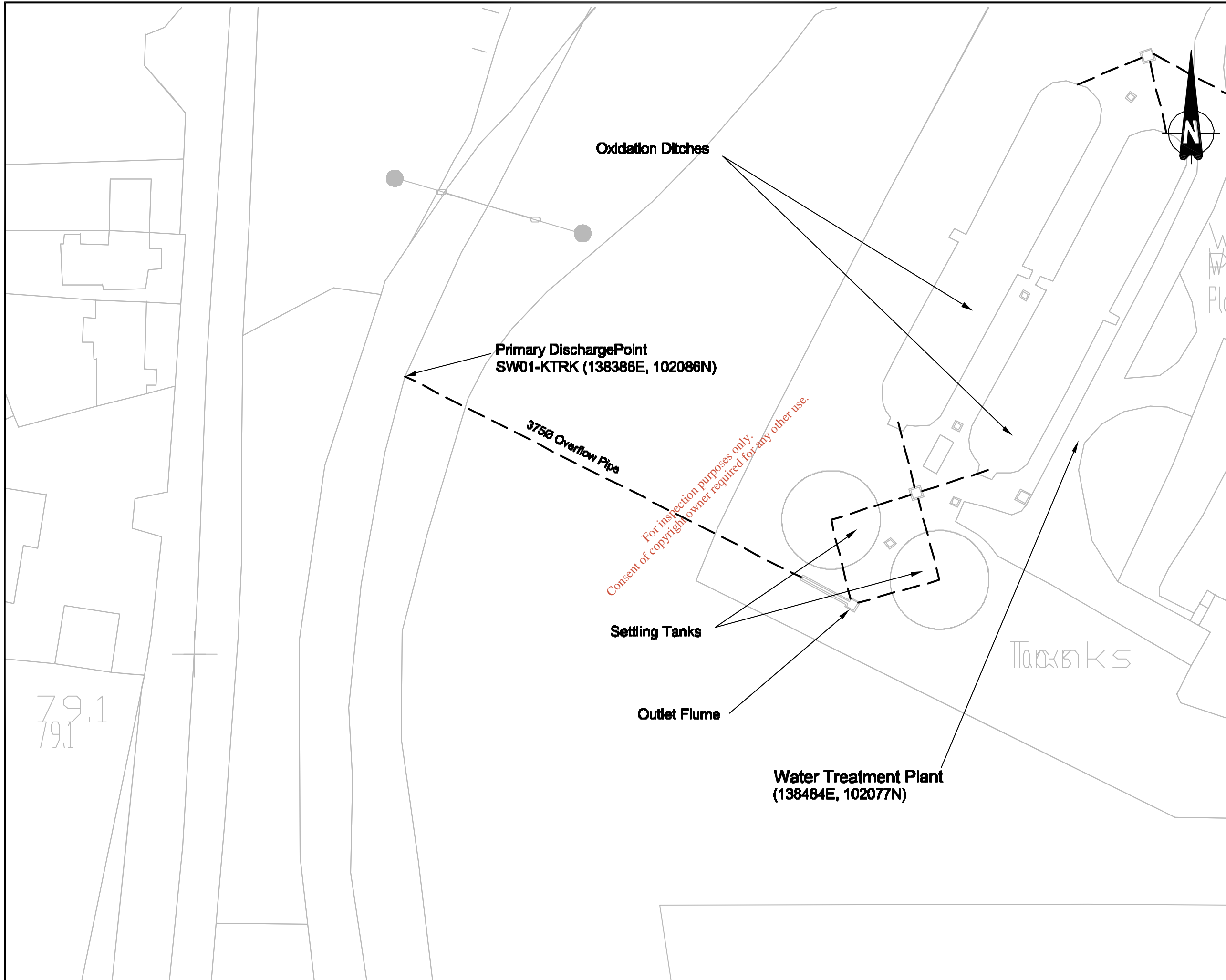
Client:  
**Cork County Council**

**RPS Consulting Engineers**  
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Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

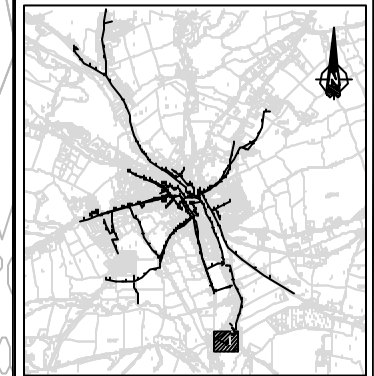
Title:  
**Attachment B2  
 1:2500 Wastewater  
 Treatment Plant Site Plan**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Org. No:	KTRK B2-03
Scale:	1/2500	Rev:	A01
Date:	July 2008		



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KEY PLAN

No.	Date	Amendment/Issue	App.
AO1	July '08	Issue for Approval	BB

Client:  
**Cork County Council**

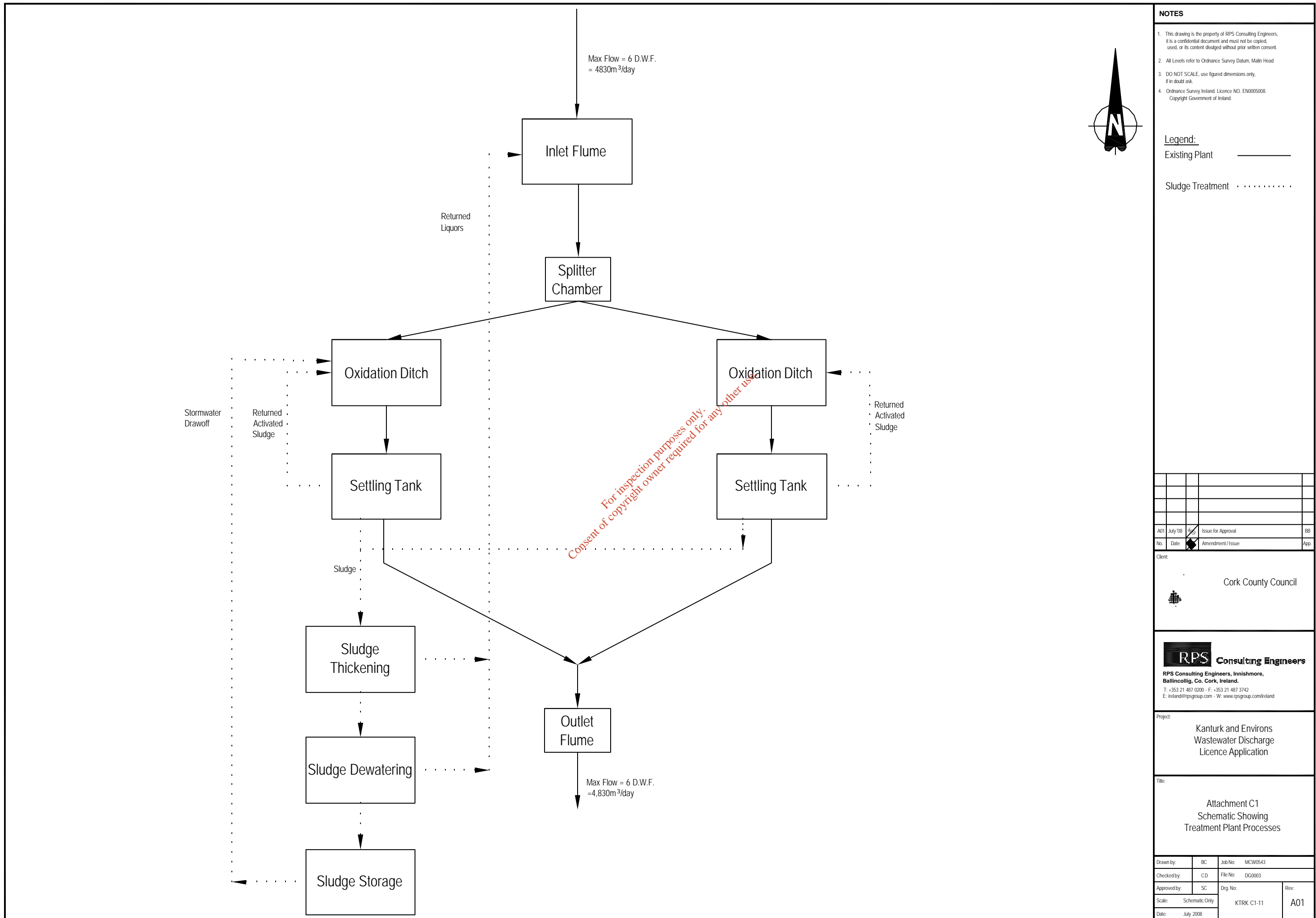
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 E: ireland@rpsgroup.com - W: www.rpsgroup.com/ireland

Project:  
**Kanturk and Environs  
 Wastewater Discharge  
 Licence Application**

Title:  
**Attachment B3  
 1:500 Location Plan of Primary  
 Discharge Point, SW01-KTRK**

Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Orig. No:	Rev:
Scale:	1/500	KTRK B3-04	A01
Date:	July 2008		





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**Legend:**  
 Existing Plant —————  
 Sludge Treatment ········

No.	Date	Amendment / Issue	App.
A01	July '08	Issue for Approval	BB

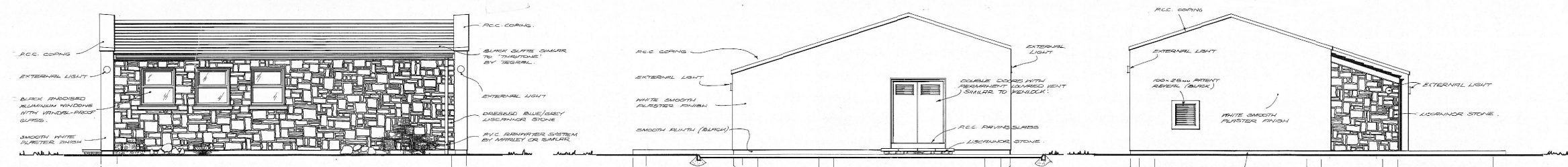
Client:  
 Cork County Council

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Project:  
 Kanturk and Environs  
 Wastewater Discharge  
 Licence Application

Title:  
 Attachment C1  
 Schematic Showing  
 Treatment Plant Processes

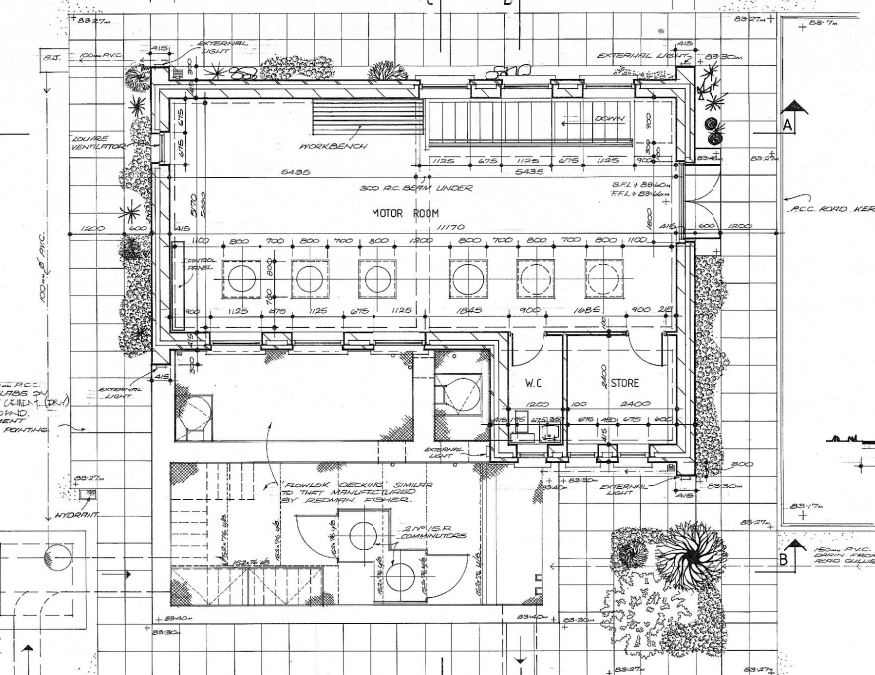
Drawn by:	BC	Job No:	MCW0543
Checked by:	CD	File No:	DG0003
Approved by:	SC	Orig. No:	Rev:
Scale:	Schematic Only	KTRK C1-11	
Date:	July 2008	A01	



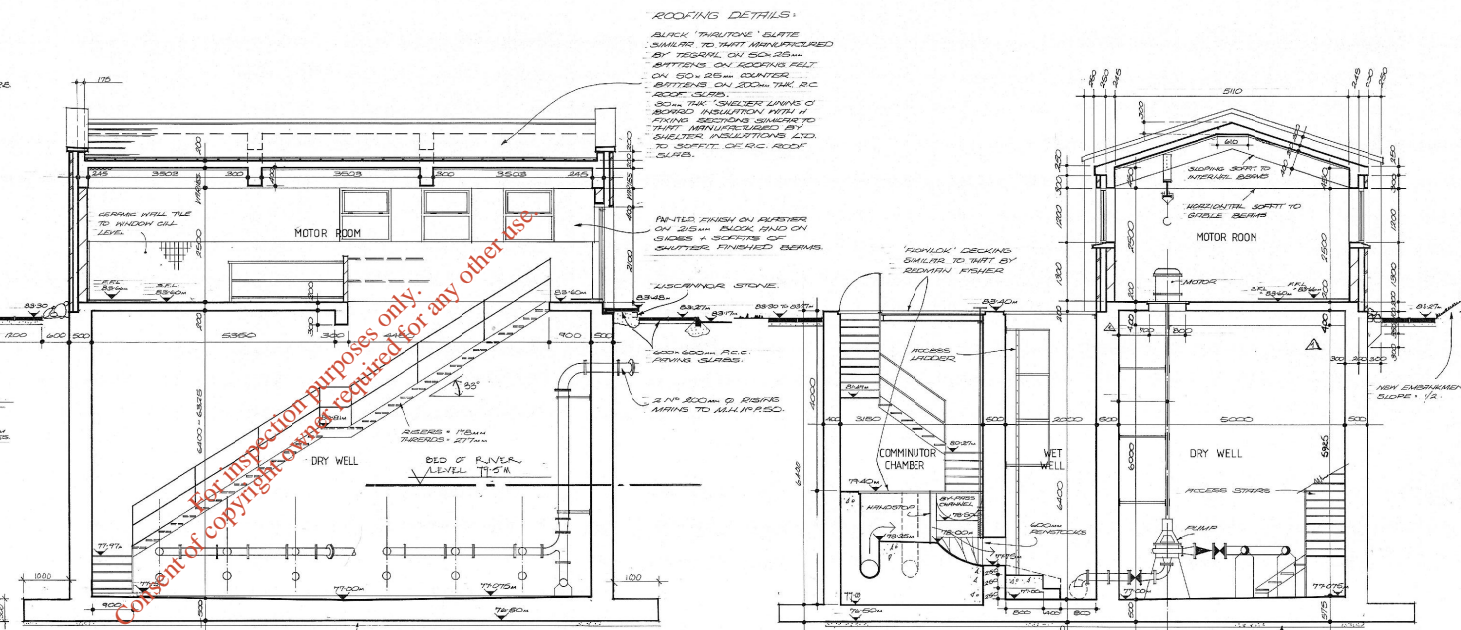
EAST ELEVATION.

SOUTH ELEVATION.

NORTH ELEVATION.

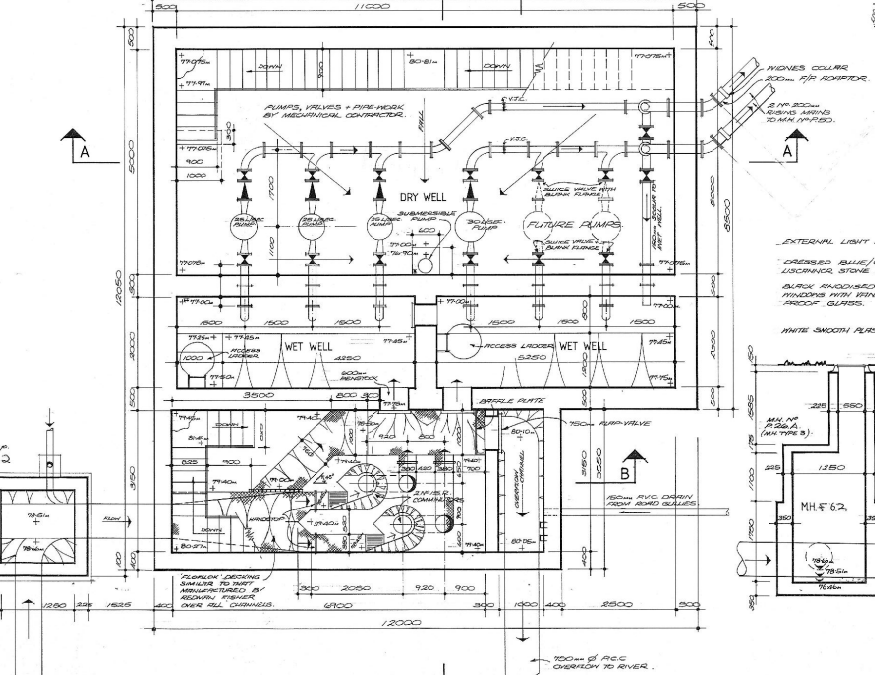


PLAN AT FLOOR LEVEL.

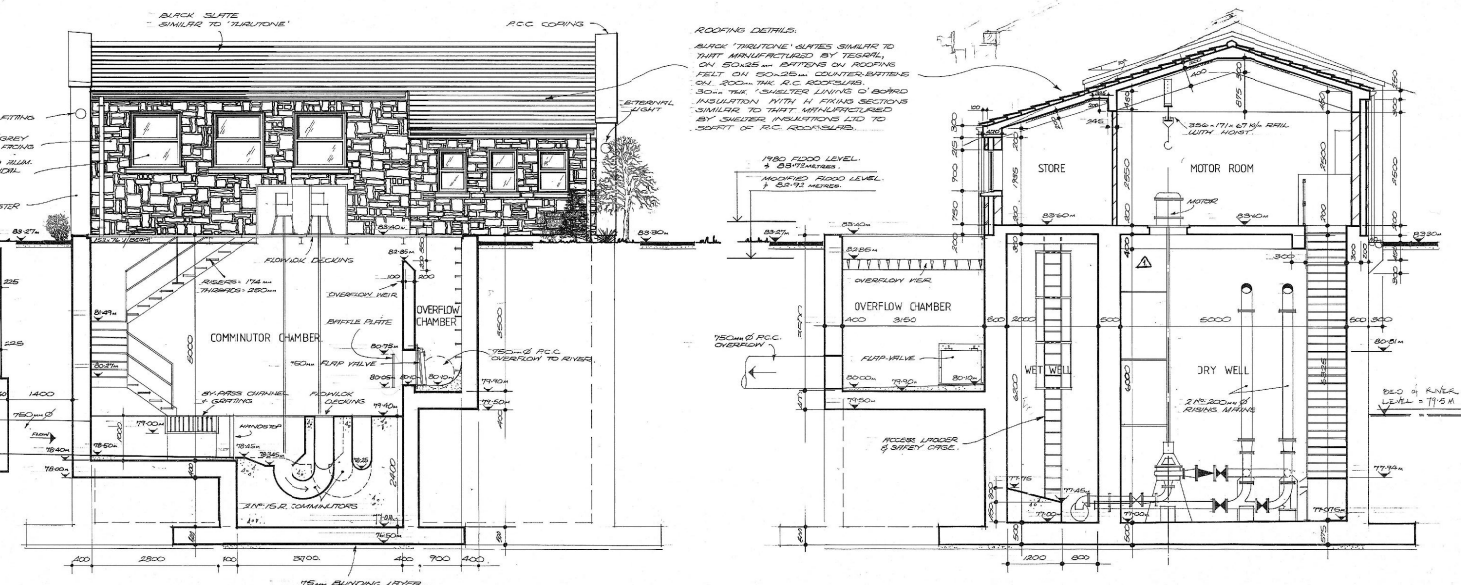


SECTIONAL ELEVATION A-A.

SECTIONAL ELEVATION C-C.



PLAN AT SUMP LEVEL.



SECTIONAL ELEVATION B-B. (WEST ELEVATION)

SECTIONAL ELEVATION D-D.

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A01	Aug. 08	Issue for Approval	BS
No.	Date	Assessment / Issue	App



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Project  
**Kanturk & Environs  
 Wastewater Discharge  
 Licence Application**

Title  
**Attachment C1  
 Details of Pump Station  
 Located 500m Upstream of WWTP**

Drawn by:	BC	Job No:	MC0008
Checked by:	CD	File No:	DG0005
Approved by:	BC	Dep. No:	
Scale:	Not to Scale	Rev:	A01
Date:	July 2008		

---

**SECTION C2: OUTFALL CONSTRUCTION AND DESIGN**

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Table C2-1 Table of Attachments

<b>Item</b>	<b>Title</b>	<b>Drg. No.</b>
1	Photograph of Secondary Discharge Point at Kanturk Pumping Station SW03KTRK	Photograph No.C2-1

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Photograph C2-1: SW03-Kant, Overflow from pumping station



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**TABLE D.1(i)(a): EMISSIONS TO SURFACE/GROUND WATERS  
(Primary Discharge Point)**

**Discharge Point Code:** SW01 Kanturk

Source of Emission:	Primary Discharge from Treatment Plant		
Location:	Gurteenard		
Grid Ref. (12 digit, 6E, 6N):	138386E 102086N		
Name of receiving waters:	River Allow		
River Basin District:	South Western River Basin District		
Designation of receiving waters:	Special Area of Conservation		
Flow rate in receiving waters:		<u>0.28</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow	
		<u>0.40</u> m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow	

**Emission Details:**

(i) Volume emitted			
Normal/day	0.00776m <sup>3</sup>	Maximum/day	675m <sup>3</sup>
Maximum rate/hour	0.00932m <sup>3</sup>	Period of emission (avg)	<u>60</u> min/hr <u>24</u> hr/day <u>365</u> day/yr
Dry Weather Flow	m <sup>3</sup> /sec		

**TABLE D.1(i)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission  
(Primary Discharge Point)**

**Discharge Point Code:** SW01 KANTURK

Number	Substance	As discharged	
		Max. daily average	
1	pH	6.5-8.5	
2	Temperature	25°C	
3	Electrical Conductivity(@25°C)	1000	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	35	23.625
5	Ammonia (as N)	25	16.875
6	Biochemical Oxygen Demand	25	16.875
7	Chemical Oxygen Demand	25	84.375
8	Total Nitrogen (as N)	25	16.875
9	Nitrite (as N)	Not applicable	Not applicable
10	Nitrate (as N)	Not applicable	Not applicable
11	Total Phosphorus (as P)	5.0	3.375
12	Orthophosphate (as P) <sup>Note 1</sup>	4.5	3.0375
13	Sulphate (SO <sub>4</sub> )	Not applicable	Not applicable
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not applicable	Not applicable

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(i)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

Primary Discharge Point - Characteristics of the emission

Discharge Point Code: SW01 KANTURK

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	<0.01	<0.00001474833	<0.00538314045
2	Dichloromethane	<1.0	<0.001474833	<0.538314045
3	Simazine	<0.01	<0.00001474833	<0.00538314045
4	Toluene	<1.0	<0.001474833	<0.538314045
5	Tributyltin	*	Not available	Not available
6	Xylenes	<1.0	<0.001474833	<0.538314045
7	Arsenic	<0.96	<0.00141583968	<0.5167814832
8	Chromium	10	0.01474833	5.38314045
9	Copper	10	0.01474833	5.38314045
10	Cyanide	<5.0	<0.007374165	<2.691570225
11	Fluoride	*	Not available	Not available
12	Lead	32	0.047194656	17.22604944
13	Nickel	10	0.01474833	5.38314045
14	Zinc	10	0.01474833	5.38314045
15	Boron	39.333	0.058009606	21.17350619
16	Cadmium	10	0.01474833	5.38314045
17	Mercury	1	0.001474833	0.538314045
18	Selenium	1	0.001474833	0.538314045
19	Barium	10	0.01474833	5.38314045

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS**  
**(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code:** SW02 Kanturk

Source of Emission:	Emergency and storm overflow
Location:	Gurteenard
Grid Ref. (12 digit, 6E, 6N):	138475E 102202N
Name of receiving waters:	River Allow
River Basin District:	South Western River Basin District
Designation of receiving waters:	Special Area of Conservation
Flow rate in receiving waters:	<u>0.28</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>0.40</u> m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow

**Emission Details:**

(i) Volume emitted		Not available	
Normal/day	m <sup>3</sup>	Maximum/day	Not available m <sup>3</sup>
Maximum rate/hour	m <sup>3</sup>	Period of emission (avg)	___min/hr ___hr/day ___day/yr
Dry Weather Flow	m <sup>3</sup> /sec		



**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)**

(Secondary Discharge Point)

**Discharge Point Code:** SW02 Kanturk

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)

Discharge Point Code: SW02 Kanturk

Number	Substance	As discharged		
		Max. daily average ( $\mu\text{g/l}$ )	kg/day	kg/year
1	Atrazine	Not Available	Not Available	Not Available
2	Dichloromethane	Not Available	Not Available	Not Available
3	Simazine	Not Available	Not Available	Not Available
4	Toluene	Not Available	Not Available	Not Available
5	Tributyltin	Not Available	Not Available	Not Available
6	Xylenes	Not Available	Not Available	Not Available
7	Arsenic	Not Available	Not Available	Not Available
8	Chromium	Not Available	Not Available	Not Available
9	Copper	Not Available	Not Available	Not Available
10	Cyanide	Not Available	Not Available	Not Available
11	Fluoride	Not Available	Not Available	Not Available
12	Lead	Not Available	Not Available	Not Available
13	Nickel	Not Available	Not Available	Not Available
14	Zinc	Not Available	Not Available	Not Available
15	Boron	Not Available	Not Available	Not Available
16	Cadmium	Not Available	Not Available	Not Available
17	Mercury	Not Available	Not Available	Not Available
18	Selenium	Not Available	Not Available	Not Available
19	Barium	Not Available	Not Available	Not Available

**TABLE D.1 (ii) (a): EMISSIONS TO SURFACE/GROUND WATERS**  
**(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code:** SW03 KANTURK

Source of Emission:	Emergency and storm overflow
Location:	Gurteenard
Grid Ref. (12 digit, 6E, 6N):	138418E 102634N
Name of receiving waters:	River Allow
River Basin District:	South Western River Basin District
Designation of receiving waters:	Special Area of Conservation
Flow rate in receiving waters:	<u>0.28</u> m <sup>3</sup> .sec <sup>-1</sup> Dry Weather Flow <u>0.40</u> m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow

**Emission Details:**

(i) Volume emitted		Not available	
Normal/day	m <sup>3</sup>	Maximum/day	Not available m <sup>3</sup>
Maximum rate/hour		Period of emission (avg)	___min/hr ___hr/day ___day/yr
Dry Weather Flow	m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)**

(Secondary Discharge Point)

**Discharge Point Code:** SW03 KANTURK

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)

Discharge Point Code: SW03 KANTURK

Number	Substance	As discharged		
		Max. daily average ( $\mu\text{g/l}$ )	kg/day	kg/year
1	Atrazine	Not Available	Not Available	Not Available
2	Dichloromethane	Not Available	Not Available	Not Available
3	Simazine	Not Available	Not Available	Not Available
4	Toluene	Not Available	Not Available	Not Available
5	Tributyltin	Not Available	Not Available	Not Available
6	Xylenes	Not Available	Not Available	Not Available
7	Arsenic	Not Available	Not Available	Not Available
8	Chromium	Not Available	Not Available	Not Available
9	Copper	Not Available	Not Available	Not Available
10	Cyanide	Not Available	Not Available	Not Available
11	Fluoride	Not Available	Not Available	Not Available
12	Lead	Not Available	Not Available	Not Available
13	Nickel	Not Available	Not Available	Not Available
14	Zinc	Not Available	Not Available	Not Available
15	Boron	Not Available	Not Available	Not Available
16	Cadmium	Not Available	Not Available	Not Available
17	Mercury	Not Available	Not Available	Not Available
18	Selenium	Not Available	Not Available	Not Available
19	Barium	Not Available	Not Available	Not Available

## Attachment E4 Kanturk Inlet

Sample Date	21/08/2007	27/09/2007	14/02/2008	28/02/2008	03/04/2008	19/06/2008	17/07/2008	02/06/2008
Sample	Influent	Influent	Influent	Influent	Influent	Influent	Influent	Influent
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	*
pH	*	*	*	*	*	*	8	7.4
Temperature °C	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	744	*	705	482
SS mg/L	*	*	*	135	*	146	168	14
NH <sub>3</sub> mg/L	16.8	16.8	13.9	*	*	20.8	16.3	4.3
BOD mg/L	*	*	*	*	*	*	183	29
COD mg/L	505	368	291	418	334	307	382	70
TN mg/L	*	*	*	*	*	*	*	*
Nitrite mg/L	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*
TP mg/L	5.65	4.53	4.05	*	2.58	*	4.2	1.5
O-PO <sub>4</sub> -P mg/L	1.4	1.93	1.5	1.41	2.04	1.98	2.49	0.9
SO <sub>4</sub> mg/L	32.8	52.9	<30	*	*	*	41.5	*
Phenols µg/L	*	*	*	*	*	*	1389.797	*
Atrazine µg/L	*	*	*	*	*	*	<0.01	*
Dichloromethane µg/L	*	*	*	*	*	*	<1	*
Simazine µg/L	*	*	*	*	*	*	<0.01	*
Toluene µg/L	*	*	*	*	*	*	<1.0	*
Tributyltin µg/L	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	<1.0	*
Arsenic µg/L	*	*	*	*	*	*	<0.96	*
Chromium mg/L	<0.02	<0.02	*	*	*	<0.02	*	<0.02
Copper mg/L	0.052	0.044	*	*	*	<0.02	*	0.025
Cyanide µg/L	*	*	*	*	*	*	<5	*
Fluoride	*	*	*	*	*	*	*	*
Lead mg/L	<0.02	0.049	*	*	*	0.039	*	0.067
Nickel mg/L	<0.02	<0.02	*	*	*	<0.02	*	<0.02
Zinc mg/L	0.11	0.061	*	*	*	0.066	*	0.046
Boron mg/L	*	0.179	*	*	*	0.119	*	0.068
Cadmium mg/L	<0.02	<0.02	*	*	*	<0.02	*	<0.02
Mercury µg/L	*	*	*	*	*	*	0.4	*
Selenium µg/L	*	*	*	*	*	*	1	*
Barium mg/L	0.067	0.023	*	*	*	0.057	*	0.022

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### Attachment E4 Kanturk Outlet

Sample Date	17/01/2007	08/03/2007	17/05/2008	21/08/2007	27/09/2007	17/10/2007	6/2/2008*	28/02/2008	03/04/2008	10/04/2008	19/06/2008	17/07/2008	Average	Kg/Day	Kg/year
Sample	Effluent	effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	effluent	effluent	Effluent			
Flow M <sup>3</sup> /Day	1543	*	1317	*	*	942	*	751	1454	559	2047	1016	1165.4	*	*
pH	7.7	7.8	8	7.8	7.8	7.9	7.6	8	*	*	7.9	8	7.875	*	*
Temperature °C	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	417	*	495	624	621	575	546.4	*	*
SS mg/L	10	8	10	11	11	7	7	5	<2.5	40	4	3	10.25	12.95746094	*
NH <sub>3</sub> mg/L	*	*	*	6.3	3.7	<0.1	1.2	1	<0.10	<0.10	0.1	<0.10	0.43	0.526726282	*
BOD mg/L	3.4	4.6	6.9	12	7.78	2.43	7	3.49	1.35	1.91	*	2.32	2.2675	4.429414618	*
COD mg/L	26	25	37	36	32	26	31	37	21	*	35	<21	29	38.71436625	*
TN mg/L	17	8.6	13.7	6.4	31.9	14.1	*	10.1	9.4	24.6	16.6	10.2	14.18	20.91313194	*
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
TP mg/L	1	0.72	1.63	1.1	*	*	0.7	1.11	0.66	*	2.28	1.83	1.316	1.75505127	*
O-PO4-P mg/L	*	*	*	0.72	*	1.48	0.5	0.97	0.53	3.66	2.08	1.51	1.541667	2.058445066	*
SO4 mg/L	*	*	*	<30	<30	<30	*	<30	*	*	*	30.7	30.35	29.84078278	*
Phenols µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.1	<0.1	<0.0001474833	*
Atrazine µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.01	<0.01	<0.00001474833	<0.00538314045
Dichloromethane	*	*	*	*	*	*	*	*	*	*	*	<1.0	<1.0	<0.001474833	<0.538314045
Simazine µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.01	<0.01	<0.00001474833	<0.00538314045
Toluene µg/L	*	*	*	*	*	*	*	*	*	*	*	<1.0	<1.0	<0.001474833	<0.538314045
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	*	*	<1.0	<1.0	<0.001474833	<0.538314045
Arsenic µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.96	<0.96	<0.00141583968	<0.5167814832
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01474833	5.38314045
Copper mg/L	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01474833	5.38314045
Cyanide µg/L	*	*	*	*	*	*	*	*	*	*	*	<5.0	<5.0	<0.007374165	<2.691570225
Fluoride	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	0.034	<0.02	*	0.041	0.028	0.03	0.029	0.023	0.0302	0.047194656	17.22604944
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01474833	5.38314045
Zinc mg/L	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01474833	5.38314045
Boron mg/L	*	*	*	*	*	*	*	0.039	0.046	0.025	0.038	0.05	0.0396	0.058009606	21.17350619
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01474833	5.38314045
Mercury µg/L	*	*	*	*	*	*	*	*	*	*	*	1	1	0.001474833	0.538314045
Selenium µg/L	*	*	*	*	*	*	*	*	*	*	*	1	1	0.001474833	0.538314045
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01474833	5.38314045

Note \* Indicates analysis by Water Services North

## Attachment E4 Kanturk Upstream

Sample Date	17/01/2007	08/03/2007	21/08/2007	27/09/2007	14/02/2008	28/02/2008	03/04/2008	10/04/2008	19/06/2008	17/07/2008
Sample	river	river	river	river	River	River	River	river	river	river
Flow M <sup>3</sup> /Day		*	*	*	*	*	*	*	*	*
pH	7.6	7.3	7.9	7.6	8.1	8	*	*	7.7	7.5
Temperature °C	*	*	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	148	166	*	158
SS mg/L	5	7	5	4	4	<2.5	<2.5	26	3	<2.5
NH <sub>3</sub> mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	*	<0.1	<0.1	<0.1
BOD mg/L	<1	<1	1.2	1.04	1.57	<1	<1.0	<1	1.08	<1.0
COD mg/L	*	<21	*	*	*	*	*	*	*	<21
TN mg/L	2.5	3.7	*	3.4	*	2.03	*	*	0.5	4.5
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*	*	*
TP mg/L	<0.2	<0.2	0.32	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2
O-PO4-P mg/L	*	*	<0.05	<0.05	<0.05	0.05	*	<0.05	<0.05	<0.05
SO4 mg/L	*	*	<30	<30	<30	<30	*	*	*	*
Phenols µg/L	*	*	*	*	*	*	*	*	*	<0.1
Atrazine µg/L	*	*	*	*	*	*	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	*	*	*	<1.0
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	<1.0
Arsenic µg/L	*	*	*	*	*	*	*	*	*	1
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	*	*	*	<5
Fluoride	*	*	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	<0.02	0.021	<0.02	<0.02	<0.02	<0.02
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron mg/L	*	*	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	*	*	*	0.6
Selenium µg/L	*	*	*	*	*	*	*	*	*	1
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.035	0.03

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## Attachment E4 Kanturk Downstream

Sample Date	17/01/2007	08/03/2007	21/08/2007	27/09/2007	14/02/2008	28/02/2008	03/04/2008	10/04/2008	19/06/2008	17/07/2008
Sample	river	river	river	river	River	River	River	river	river	river
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	*	*	*
pH	7.5	7.3	8.1	8	8.1	7.9	*	*	7.9	8
Temperature °C	*	*	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	159	165	*	164
SS mg/L	*	6	*	*	<2.5	9	<2.5	<2.5	3	3
NH <sub>3</sub> mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BOD mg/L	<1	<1	<1	1.1	1.56	1.17	<1.0	<1	*	<1.0
COD mg/L	*	<21	*	*	*	*	*	*	*	<21
TN mg/L	3.2	2.9	9	4.4	*	2.38	2.7	*	2.1	3.3
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*	*	*
TP mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	*	<0.2	<0.2
O-PO4-P mg/L	*	*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SO4 mg/L	*	*	<30	<30	<30	<30	*	*	*	<30
Phenols µg/L	*	*	*	*	*	*	*	*	*	<0.1
Atrazine µg/L	*	*	*	*	*	*	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	*	*	*	<1.0
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	<1.0
Arsenic µg/L	*	*	*	*	*	*	*	*	*	1
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02
Copper mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	*	*	*	<5
Fluoride	*	*	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	<0.02	<0.02
Zinc mg/L	*	*	<0.02	<0.02	<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	*	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	*	*	*	1.1
Selenium µg/L	*	*	*	*	*	*	*	*	*	1
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*	0.032	0.03

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## SECTION F1: ASSESSMENT OF IMPACTS OF WASTE WATER DISCHARGES ON RECEIVING WATERS

Table F1-1: Table of Attachments

Item	Title	Drg. No.
1*	Cork County Council Wastewater Laboratory Test Report for Wastewater Treatment Plant outlet	Page No. F1-2
2	Table F1-8: Kanturk WWTP Assimilative Capacity Assessment	Page No. F1-6
3	Table F1-9: Cork County Council Wastewater Laboratory Recorded River Quality upstream of WWTP	Page No. F1-7
4	Table F1-10: Cork County Council Wastewater Laboratory Recorded River Quality downstream of WWTP	Page No. F1-8
5	Special Area of Conservation: River Blackwater Site Synopsis	Page No. F1-9

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Laboratory Test Report  
Cork County Council  
Waste Water Laboratory  
Inniscarra, Co. Cork

Page 1 of 1  
July 10, 2007

Industry Name: Kanturk Sewage Works  
Address: Kanturk, Co. Cork

Industry Code No. 310  
Report Ref No. S10-07-08-169  
Issued to: E. O'Sullivan  
Site: Inlet Station W/W

Licence No. Type S

Licence Limit	Volume m3	pH	B.O.D. mg/l	C.O.D. mg/l	Sus Solids mg/l	TP-P mg/l	Code	Comments
999999		12.00	25	125	35	99		
		3.99	25	125	35	99		
Date								
12/01/07	1343	7.7	3.4	26	10	1.0	GR003	C TN-N5= 17mg/l
08/03/07		7.8	4.6	23	8	0.72	GR210	C TN-N5=8.6mg/l
17/05/07	1317	8.0	6.9	37	10	1.63	GR395	C TN-N5=13.2mg/l, TP-P= <
21/08/07		7.8	12	36	14	1.1	GR768	C NH3-N=6.3mg/l, SRP= <30mg
27/09/07		7.8	7.78	32	11		GR889	C NH3-N=2.7mg/l, SRP= <30mg/l
17/10/07	942	7.9	2.49	26	7		GR987	C TN-N5=14.1MG/L
14/02/08		8.3	1.95	23	<2.5	0.56	GS197	C NH3-N= <0.1mg/l
28/02/08	751	8.0	3.49	37	5	1.11	GS134	C NH3-N=1.6mg/l
03/04/08			1.4	21	<2.5	0.66	GS243	C OPO4-P=0.53mg/l, TN-N5= <
10/04/08			1.9	<21	+ 40		GS116	C OPO4-P=0.66mg/l, TN-N5= <
% Compl.	100	100	100	100	90	100		
Average	1136.28	7.91	4.59	26.28	10.20	0.97		

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 21st Edition 2005, APHA, AWWA, WEF. C = Composite Sample, G = Grab Sample.

The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page Chemical Procedure Numbers (CP No.) for INAB accredited tests are as follows:

- CP NO. 1 = B.O.D.
- CP NO. 3 = S.S.
- CP NO. 20 = TP-P
- CP NO. 5 = pH
- CP NO. 6 = C.O.D.
- CP NO. 7 = Cl
- CP NO. 22 = Ammonia (KONELAB)
- CP NO. 23 = OPO4-P (KONELAB)
- CP NO. 24 = Chloride (KONELAB)
- CP NO. 25 = Sulphate (KONELAB)

This report relates only to the samples listed above. This report shall not be reproduced except in full and only with the approval of the testing laboratory. Cork County Council is not accredited by INAB for tests marked with \$ Kg loadings based on flows as supplied by the company. ~ indicates results that have been edited.

Reported by: [Signature] Date: 10/07/07

Ms. V. Hanson Technical Manager  
Deputy Technical Manager

CTR 001 Issue No 5 November 2007

### Wastewater Laboratory Cork County Council- Test Report Addendum

- a. Sample date reported in column 1 of this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
- b. Cork County Council wastewater laboratory are not accredited for sample collection.
- c. Data reported in (d) below is defined in section 5.10.3 (c) in wastewater laboratory quality manual.
- d. Table of Uncertainty Of Measurement – Estimate Of Values For Accredited Tests

Chemical Procedure No.	Range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD)	± 0.50	mg/l
CP No. 1	9 - 70 mg/l	Biochemical Oxygen Demand (BOD)	± 3.2	mg/l
CP No. 1	71 - 700 mg/l	Biochemical Oxygen Demand (BOD)	± 40	mg/l
CP No. 2	55 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	200 - 400 mg/l	Suspended Solids (SS)	± 41.6	mg/l
CP No. 3	700 - 1400 mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 13	pH	± 0.12	pH Units
CP No. 6	< 4 mg/l	Chemical Oxygen Demand (COD LR)	± 5.6	mg/l
CP No. 6	15 - 75 mg/l	Chemical Oxygen Demand (COD LR)	± 10.6	mg/l
CP No. 6	100 - 135 mg/l	Chemical Oxygen Demand (COD LR)	± 17.4	mg/l
CP No. 6	140 - 160 mg/l	Chemical Oxygen Demand (COD LR) High Range	± 26.8	mg/l
CP No. 7	5.0 - 135 mg/l	Chloride (Cl)	± 9.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Amo P (KoneLab)	± 0.23	mg/l
CP No. 22	0.1 - 0.5 mg/l	Ammonia (KoneLab)	± 0.04	mg/l
CP No. 22	1.0 - 2.0 mg/l	Ammonia (KoneLab)	± 0.10	mg/l
CP No. 22	2 - 10 mg/l	Ammonia (KoneLab)	± 0.32	mg/l
CP No. 22	13 - 19 mg/l	Ammonia (KoneLab)	± 0.72	mg/l
CP No. 22	20 - 25 mg/l	Ammonia (KoneLab)	± 1.56	mg/l
CP No. 23	0.05 - 1.00 mg/l	Orthophosphate as P (KoneLab)	± 0.04	mg/l
CP No. 24	25.00 - 99.99 mg/l	Chloride (KoneLab)	± 7.64	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (KoneLab)	± 13.16	mg/l
CP No. 25	30.00 - 199.00 mg/l	Sulphate (KoneLab)	± 3.42	mg/l
CP No. 25	200.00 - 299.00 mg/l	Sulphate (KoneLab)	± 8.70	mg/l

November 2007

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.

The method followed is located in the Uncertainty of Measurement file and in the Barchem Guidelines for Quantifying Uncertainty in Analytical Measurement.



Laboratory Test Report  
 Cork County Council  
 Waste Water Laboratory  
 Inniscarra, Co. Cork

Page 1 of 1  
 July 10, 2008

Industry Name: Kanturk Sewage Works  
 Address: Kanturk, Co. Cork

Industry Code No. 310  
 Report Ref No. See CP-02 (P.O.)  
 Issued to E. Cronin  
See Waste Schedule (P.O.)

License No. Type S

License/Limit	Volume m <sup>3</sup>	pH	B.O.D. mg/l	C.O.D. mg/l	Sus Solids mg/l	TP-P mg/l	Code	Comments
999999		12.00	25	125	35	99		
17/01/07	1543	7.7	3.4	26	10	1.0	GR003	Cl TN-NH <sub>3</sub> = 17mg/L
08/03/07		7.8	4.6	25	8	0.72	GR230	Cl TN-NH <sub>3</sub> = 8.6mg/L
17/05/07	1317	8.0	6.9	37	10	1.63	GR393	Cl TN-NH <sub>3</sub> = 13.7mg/L, THODS = <1
21/08/07		7.8	12	36	11	1.1	GR768	Cl KJIS = 6.3mg/L, SO <sub>4</sub> S = <30mg/l
27/09/07		7.8	7.78	32	11		GR889	Cl SO <sub>4</sub> S = 3.7mg/l, SO <sub>4</sub> S = <30mg/l
17/10/07	942	7.9	2.43	26	7		GR987	Cl TN-NH <sub>3</sub> = 14.1mg/L
% Compl. Average	100 / 5267.33	100 / 7.83	100 / 6.19	100 / 30.33	100 / 9.38	100 / 1.11		

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 20th Edition 2005, APHA, AWWA, WEF.  
 C = Composite Sample, G = Grab Sample.  
 The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page  
 Chemical Procedure Numbers (CP No.) for INAB accredited tests are as follows:  
 CP NO. 1 = B.O.D. CP NO. 3 = S.S. CP NO. 20 = TP-P CP NO. 23 = Ammonia (KONELAB)  
 CP NO. 5 = pH CP NO. 6 = C.O.D. CP NO. 7 = Cl CP NO. 25 = Sulphate (KONELAB)  
 CP NO. 25 = OPO4-P (KONELAB) CP NO. 24 = Chloride (KONELAB)  
 This report relates only to the samples listed above. This report shall not be reproduced except in full and only with the approval of the testing laboratory. Cork County Council is not accredited by INAB for tests marked with S.  
 Kg loadings based on flows as supplied by the company. \* indicates results that have been edited.

Reported by: V. Hannon Date: 10/07/08

Mrs. V. Hannon Technical Manager  
 Deputy Technical Manager

CTR 001 Issue No 5 November 2007

### Wastewater Laboratory Cork County Council- Test Report Addendum

- Sample date reported in column 1 on this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
- Cork County Council wastewater laboratory are not accredited for sample collection.
- Data reported in (d) below is defined in section 5.16.3 (b) in wastewater laboratory quality manual.
- Table of Uncertainty Of Measurement - Estimate Of Values For Accredited Tests

Chemical Procedure No.	range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD)	± 0.95	mg/l
CP No. 1	9 - 20 mg/l	Biochemical Oxygen Demand (BOD)	± 1.2	mg/l
CP No. 1	21 - 200 mg/l	Biochemical Oxygen Demand (BOD)	± 4.0	mg/l
CP No. 3	25 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	260 - 400 mg/l	Suspended Solids (SS)	± 41.6	mg/l
CP No. 3	760 - 1000 mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 12	pH	± 0.12	pH Units
CP No. 6	< 5 mg/l	Chemical Oxygen Demand (COD LR)	± 5.6	mg/l
CP No. 6	15 - 75 mg/l	Chemical Oxygen Demand (COD LR)	± 10.6	mg/l
CP No. 6	160 - 155 mg/l	Chemical Oxygen Demand (COD LR)	± 17.4	mg/l
CP No. 6	120 - 1500 mg/l	Chemical Oxygen Demand (COD High Range)	± 36.8	mg/l
CP No. 7	5.0 - 125 mg/l	Chloride (Cl)	± 6.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Total Phosphorus (TP)	± 0.22	mg/l
CP No. 23	0.1 - 0.9 mg/l	Ammonia (Kometab)	± 0.04	mg/l
CP No. 22	1.0 - 2.0 mg/l	Ammonia (Kometab)	± 0.10	mg/l
CP No. 22	2 - 10 mg/l	Ammonia (Kometab)	± 0.30	mg/l
CP No. 22	11 - 19 mg/l	Ammonia (Kometab)	± 0.72	mg/l
CP No. 22	20 - 25 mg/l	Ammonia (Kometab)	± 1.56	mg/l
CP No. 23	0.55 - 1.00 mg/l	Oxalacetate as P (Kometab)	± 0.04	mg/l
CP No. 24	25.00 - 80.00 mg/l	Chloride (Kometab)	± 3.04	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (Kometab)	± 11.16	mg/l
CP No. 25	30.00 - 190.00 mg/l	Sulphate (Kometab)	± 3.42	mg/l
CP No. 25	200.00 - 250.00 mg/l	Sulphate (Kometab)	± 8.70	mg/l

November 2007

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.

The method followed is located in the Uncertainty of Measurement file and in the Eurachem Guidelines for Quantifying Uncertainty in Analytical Measurement.

**Table F1-8: Kanturk Assimilative Capacity Assessment**

P.E.	Parameter	Receiving waters Background concentration	Upstream		WWTP		Downstream Water Quality		Receiving Water Quality Limiting Value	Q- Rating
			Upstream River Flow See Note 1 below	Discharge Flow	Effluent Discharge Standard	Flow	Expected Water Quality			
		mg/l	l/s	m <sup>3</sup> /d	m <sup>3</sup> /d	mg/l	m <sup>3</sup> /d	mg/l		
17/01/2007	BOD	1	400.00	34560.00	1543	3.40	36103.00	1.10	2	04
	SS	3.5	400.00	34560.00	1543	10.00	36103.00	3.78	25	
	Phosphorus	0.025	5060.00	437184.00	1543	-	438727.00	-	0.03	
17/05/2007	BOD	1	400.00	34560.00	1317	6.90	35877.00	1.22	2	04
	SS	3.5	400.00	34560.00	1317	10.00	35877.00	3.74	25	
	Phosphorus	0.025	5060.00	437184.00	1317	-	438501.00	-	0.03	
17/10/2007	BOD	1	400.00	34560.00	942	2.43	35502.00	1.04	2	04
	SS	3.5	400.00	34560.00	942	7.00	35502.00	3.59	25	
	Phosphorus	0.025	5060.00	437184.00	942	1.48	438126.00	0.028	0.03	
28/02/2008	BOD	1	400.00	34560.00	751	3.49	35311.00	1.05	2	04
	SS	3.5	400.00	34560.00	751	5.00	35311.00	3.53	25	
	Phosphorus	0.025	5060.00	437184.00	751	0.97	437935.00	0.027	0.03	
17/07/2008	Atrazine	0.000005	280.00	24192.00	1016	0.00001	25208.00	0.00001	0.001	04
	Dichloromethane	0.0005	280.00	24192.00	1016	0.00050	25208.00	0.00050	0.01	
	Simazine	0.000005	280.00	24192.00	1016	0.00001	25208.00	0.00001	0.001	
	Xylenes	0.0005	280.00	24192.00	1016	0.00050	25208.00	0.00050	0.01	
	Arsenic	0.001	280.00	24192.00	1016	0.00048	25208.00	0.00098	0.025	
	Copper	0.00001	280.00	24192.00	1016	0.01000	25208.00	0.00041	0.005	
	Cyanide	0.0025	280.00	24192.00	1016	0.00250	25208.00	0.00250	0.01	
	Lead	0.01	280.00	24192.00	1016	0.02300	25208.00	0.01052	0.005	
	Nickel	0.01	280.00	24192.00	1016	0.01000	25208.00	0.01000	0.008	
	Zinc	0.01	280.00	24192.00	1016	0.01000	25208.00	0.01000	0.05	
<b>Note 1:</b>	Median Flow is used to calculate assimilative capacity for Orthophosphate, DWF is used for dangerous substances and 95%-ile flow is used for all other substances.									
	BOD limiting value is based on the BOD background + 1mg/l as recommended by Royal Commission in it's report on Water Quality Guidelines.									
	SS limiting value is 25mg/l which is based on the Freshwater Fish Directive in the absence of alternative guidance.									
	Phosphorus standard for a Q4 rated river is 0.03mg/l.									
	Limiting Values for dangerous substances from Dangerous Substances Act 2001 (based on River Allow CaCO3 content <100mg/l)									

Table F1-9: River Allow Water Quality (Upstream of Kanturk WWTP)

Sample Date	17/01/2007	08/03/2007	21/08/2007	27/09/2007	14/02/2008	28/02/2008	03/04/2008	10/04/2008
Sample	river	river	river	river	River	River	River	river
Flow M <sup>3</sup> /Day					*	*	*	*
pH	7.6	7.3	7.9	7.6	8.1	8	*	*
Temperature °C	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	148	166
SS mg/L	5	7	5	4	4	<2.5	<2.5	26
NH <sub>3</sub> mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	*	<0.1
BOD mg/L	<1	<1	1.2	1.04	1.57	<1	<1.0	<1
COD mg/L	*	<21	*	*	*	*	*	*
TN mg/L	2.5	3.7	*	3.4	*	2.03	*	*
Nitrite mg/L	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*
TP mg/L	<0.2	<0.2	0.33	<0.2	<0.2	<0.2	<0.20	<0.2
O-PO4-P mg/L	*	*	<0.05	<0.05	<0.05	0.05	*	<0.05
SO4 mg/L	*	*	<30	<30	<30	<30	*	*
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	*	*
Fluoride	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	<0.02	0.021	<0.02	<0.02
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron mg/L	*	*	*	*	<0.02	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	*	*
Selenium µg/L	*	*	*	*	*	*	*	*
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02



Table F1-10: River Allow Water Quality (Downstream of Kanturk WWTP)

Sample Date	17/01/2007	08/03/2007	21/08/2007	27/09/2007	14/02/2008	28/02/2008	03/04/2008	10/04/2008
Sample	river	river	river	river	River	River	River	river
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	*
pH	7.5	7.3	8.1	8	8.1	7.9	*	*
Temperature °C	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	159	165
SS mg/L	*	6	*	*	<2.5	9	<2.5	<2.5
NH <sub>3</sub> mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BOD mg/L	<1	<1	<1	1.1	1.56	1.17	<1.0	<1
COD mg/L	*	<21	*	*	*	*	*	*
TN mg/L	3.2	2.9	9	4.4	*	2.38	2.7	*
Nitrite mg/L	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*
TP mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	*
O-PO4-P mg/L	*	*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SO4 mg/L	*	*	<30	<30	<30	<30	*	*
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	*	*	*	*	*	*	*	*
Fluoride	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*
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	*
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*
Mercury µg/L	*	*	*	*	*	*	*	*
Selenium µg/L	*	*	*	*	*	*	*	*
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*

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## 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, Aragin, Awbeg (Buttevant), Clyda, Glen, Allow, Duhra, Brogeen, Rathcool, Finnrow, Owestaragin 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, Casletownroche, Fermoy, Ballyduff, Rathcornea, 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 Bogguraghs 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 Ballyhooley; 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 Aragin 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, Twaitt 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. trianulra*) 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*), Gaelder 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 menziesii*). 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 (*Monarda 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 (*Lysimachie 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*), Henlock 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 *Fountainis 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 Anuagh 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 Ballinatrav, 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 Ripcrew, 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 masculina*).

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 filix-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 (*Labaria* spp.) is the most conspicuous and is widespread.

The Araghin 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*), Gaelic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobancha hederace*), 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 (*Eunymus 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 Banaglanna 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 sraw 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 Glenaskeefe 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. *oleifolia*) 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 furoid 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 Blacklog. 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-bitte (*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 Babinington's Orache (*A. glabrescens*). 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 *Rhytidiaulophus squarrosus*).

The site supports several Red Data Book plant species, i.e. Starved Wood Sedge (*Carex depauperata*), Kilarney Fern (*Trichomanes speciosum*), Peanyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neotria 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 Loek (*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*), Twaise Shad (*Alasa 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 grise 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, *Metrloptera rosellii* (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. 214, 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 886), 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 (1686), Knot (150), Dunlin (2293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4906) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kingsibeg 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 Dromans Rock; c. 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and c. 20 pairs at Rincrow 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 styes 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. Ballynny 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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13.09.2006

**TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING**  
**(Primary Discharge Point – one table per upstream and downstream location)**

**Discharge Point Code:** SW01-KTRK

**MONITORING POINT CODE:** ASWO1u- KTRK

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
pH	*	*	7.7	7.5	Grab	2	Electrochemical
Temperature	*	*	*	*	Grab	N/A	N/A
Electrical Conductivity (@20°C)	148	166	*	158	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	<2.5	26	3	<2.5	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	*	<0.1	<0.1	<0.1	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	<1.0	<1	1.08	<1.0	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	*	*	*	<21	Grab	8 mg/L	Digestion + Calorimetric
Dissolved Oxygen	*	*	*	*	Grab	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	*	*	*	*	Grab	N/A	N/A
Total Nitrogen (as N)	*	*	0.5	4.5	Grab	0.5 mg/L	Digestion + Calorimetric
Nitrite (as N)	*	*	*	0.0148	Grab	0.004 mg/L	Colorimetric
Nitrate (as N)	*	*	*	2.13	Grab	0.4 mg/L	Colorimetric
Total Phosphorus (as P)	<0.20	<0.2	<0.2	<0.2	Grab	0.2 mg/L	Digestion + Calorimetric
Orthophosphate (as P) - unfiltered	*	<0.05	<0.05	<0.05	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	*	*	*	*	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	*	*	*	<0.1	Grab	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)  
(Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SW01-KTRK

MONITORING POINT CODE: ASWO1u-KTRK

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
Atrazine	*	*	*	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	*	*	*	<1	Grab	1 µg/L	GC-MS 1
Simazine	*	*	*	<0.01	Grab	0.01 µg/L	HPLC
Toluene	*	*	*	<1.0	Grab	0.02 µg/L	GC-MS 1
Tributyltin	*	*	*	*	Grab	1 µg/L as Sn	GC-MS 1
Xylenes	*	*	*	<1.0	Grab	0.96 µg/L	GC-MS 1
Arsenic	*	*	*	*	Grab	0.02 mg/L	ICP-MS
Chromium	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Copper	<20	<20	<20	<20	Grab	5 mg/L	ICP-OES
Cyanide	*	*	*	<5	Grab	0.01 µg/L	Colorimetric
Fluoride	*	*	*	<100	Grab	0.1 mg/L	ISE
Lead	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Nickel	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Zinc	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Boron	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Cadmium	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Mercury	*	*	*	0.6	Grab	0.02 µg/L	ICP-MS
Selenium	*	*	*	1	Grab	0.74 µg/L	ICP-MS
Barium	<20	<20	35	30	Grab	0.02 mg/L	ICP-OES

**TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING**  
**(Primary Discharge Point – one table per upstream and downstream location)**

**Discharge Point Code:** SW01-KTRK

**MONITORING POINT CODE:** ASWO1d- KTRK

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
pH	*	*	7.9	8	Grab	2	Electrochemical
Temperature	*	*	*	*	Grab	N/A	N/A
Electrical Conductivity (@20°C)	159	165	*	164	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	<2.5	<2.5	3	3	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	<0.1	<0.1	<0.1	<0.1	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	<1.0	<1	*	<1.0	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	*	*	*	<21	Grab	8 mg/L	Digestion + Calorimetric
Dissolved Oxygen	*	*	*	*	Grab	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	*	*	*	*	Grab	N/A	N/A
Total Nitrogen (as N)	2.7	*	2.1	3.3	Grab	0.5 mg/L	Digestion + Calorimetric
Nitrite (as N)	*	*	*	0.0184	Grab	0.004 mg/L	Colorimetric
Nitrate (as N)	*	*	*	5.43	Grab	0.4 mg/L	Colorimetric
Total Phosphorus (as P)	<0.2	*	<0.2	<0.2	Grab	0.2 mg/L	Digestion + Calorimetric
Orthophosphate (as P) - unfiltered	<0.05	<0.05	<0.05	<0.05	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	*	*	*	<30	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	*	*	*	<0.1	Grab	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)**  
**(Primary Discharge Point - one table per upstream and downstream location)**

**Discharge Point Code:** SW01-KTRK

**MONITORING POINT CODE:** ASWO1d-KTRK

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
Atrazine	*	*	*	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	*	*	*	<1	Grab	1 µg/L	GC-MS 1
Simazine	*	*	*	<0.01	Grab	0.01 µg/L	HPLC
Toluene	*	*	*	<1.0	Grab	0.02 µg/L	GC-MS 1
Tributyltin	*	*	*	*	Grab	1 µg/L as Sn	GC-MS 1
Xylenes	*	*	*	<1.0	Grab	0.96 µg/L	GC-MS 1
Arsenic	*	*	*	1	Grab	0.02 mg/L	ICP-MS
Chromium	<20	*	<20	<20	Grab	0.02 mg/L	ICP-OES
Copper	<20	*	<20	<20	Grab	5 mg/L	ICP-OES
Cyanide	*	*	*	<5	Grab	0.01 µg/L	Colorimetric
Fluoride	*	*	*	<100	Grab	0.1 mg/L	ISE
Lead	<20	*	<20	<20	Grab	0.02 mg/L	ICP-OES
Nickel	<20	*	<20	<20	Grab	0.02 mg/L	ICP-OES
Zinc	<20	*	<20	<20	Grab	0.02 mg/L	ICP-OES
Boron	<20	*	<20	<20	Grab	0.02 mg/L	ICP-OES
Cadmium	<20	*	<20	<20	Grab	0.02 mg/L	ICP-OES
Mercury	*	*	*	1.1	Grab	0.02 µg/L	ICP-MS
Selenium	*	*	*	1	Grab	0.74 µg/L	ICP-MS
Barium	<20	*	32	30	Grab	0.02 mg/L	ICP-OES

TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING

(Primary Discharge Point – one table per upstream and downstream location)

Discharge Point Code: SWO1 Kanturk

MONITORING POINT CODE: aSWO1u KANTURK

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
pH	Not available	Not available	7.7	7.5	Grab	2	Electrochemical
Temperature	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Electrical Conductivity (@20°C)	148	166	Not available	158	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	<2.5	26	3	<2.5	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	Not available	<0.1	<0.1	<0.1	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	<1.0	<1	1.08	<1.0	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	Not available	Not available	Not available	<21	Grab	8 mg/L	Digestion + Calorimetric
Dissolved Oxygen	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Total Nitrogen (as N)	Not available	Not available	0.5	4.5	Grab	0.5 mg/L	Digestion + Calorimetric
Nitrite (as N)	Not available	Not available	Not available	0.0148	Grab	0.004 mg/L	Colorimetric
Nitrate (as N)	Not available	Not available	Not available	2.13	Grab	0.4 mg/L	Colorimetric
Total Phosphorus (as P)	<0.20	<0.2	<0.2	<0.2	Grab	0.2 mg/L	Digestion + Calorimetric
Orthophosphate (as P) - unfiltered	Not available	<0.05	<0.05	<0.05	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	Not available	Not available	Not available	Not available	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available	Not available	<0.1	Grab	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)  
(Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SWO1 Kanturk

MONITORING POINT CODE: aSWO1u KANTURK

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
Atrazine	Not available	Not available	Not available	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	Not available	Not available	Not available	<1	Grab	1 µg/L	GC-MS 1
Simazine	Not available	Not available	Not available	<0.01	Grab	0.01 µg/L	HPLC
Toluene	Not available	Not available	Not available	<1.0	Grab	0.02 µg/L	GC-MS 1
Tributyltin	Not available	Not available	Not available	Not available	Grab	1 µg/L as Sn	GC-MS 1
Xylenes	Not available	Not available	Not available	<1.0	Grab	0.96 µg/L	GC-MS 1
Arsenic	Not available	Not available	Not available	<1	Grab	0.02 mg/L	ICP-MS
Chromium	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Copper	<20	<20	<20	<20	Grab	5 mg/L	ICP-OES
Cyanide	Not available	Not available	Not available	<5	Grab	0.01 µg/L	Colorimetric
Fluoride	Not available	Not available	Not available	<100	Grab	0.1 mg/L	ISE
Lead	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Nickel	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Zinc	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Boron	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Cadmium	<20	<20	<20	<20	Grab	0.02 mg/L	ICP-OES
Mercury	Not available	Not available	Not available	0.6	Grab	0.02 µg/L	ICP-MS
Selenium	Not available	Not available	Not available	1	Grab	0.74 µg/L	ICP-MS
Barium	<20	<20	35	30	Grab	0.02 mg/L	ICP-OES

TABLE F.1 (i) (a): SURFACE/GROUND WATER MONITORING

(Primary Discharge Point – one table per upstream and downstream location)

Discharge Point Code: SWO1 Kanturk

MONITORING POINT CODE: aSWO1d KANTURK

Parameter	Results (mg/l <sup>Note 1</sup> )				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
pH	Not available	Not available	7.9	8	Grab	2	Electrochemical
Temperature	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Electrical Conductivity (@20°C)	159	165	Not available	164	Grab	0.5 µmhos/cm	Electrochemical
Suspended Solids	<2.5	<2.5	3	3	Grab	0.5 mg/L	Gravimetric
Ammonia (as N)	<0.1	<0.1	<0.1	<0.1	Grab	0.02 mg/L	Colorimetric
Biochemical Oxygen Demand	<1.0	<1	Not available	<1.0	Grab	0.06 mg/L	Electrochemical
Chemical Oxygen Demand	Not available	Not available	Not available	<21	Grab	8 mg/L	Digestion + Calorimetric
Dissolved Oxygen	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Hardness (as CaCO <sub>3</sub> )	Not available	Not available	Not available	Not available	Grab	N/A	N/A
Total Nitrogen (as N)	2.7	Not available	2.1	3.3	Grab	0.5 mg/L	Digestion + Calorimetric
Nitrite (as N)	Not available	Not available	Not available	0.0184	Grab	0.004 mg/L	Colorimetric
Nitrate (as N)	Not available	Not available	Not available	5.43	Grab	0.4 mg/L	Colorimetric
Total Phosphorus (as P)	<0.2	Not available	<0.2	<0.2	Grab	0.2 mg/L	Digestion + Calorimetric
Orthophosphate (as P) - unfiltered	<0.05	<0.05	<0.05	<0.05	Grab	0.02 mg/L	Colorimetric
Sulphate (SO <sub>4</sub> )	Not available	Not available	Not available	<30	Grab	30 mg/L	Turbidimetric
Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available	Not available	<0.1	Grab	0.1 µg/L	GC-MS 2

Note 1: Or other unit as appropriate – please specify.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.



TABLE F.1 (i) (b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)  
(Primary Discharge Point - one table per upstream and downstream location)

Discharge Point Code: SWO1 Kanturk

MONITORING POINT CODE: aSWO1d KANTURK

Parameter	Results (µg/l)				Sampling method (grab, drift etc.)	Limit of Quantitation	Analysis method / technique
	03/04/08	10/04/08	19/06/08	17/07/08			
Atrazine	Not available	Not available	Not available	<0.01	Grab	0.96 µg/L	HPLC
Dichloromethane	Not available	Not available	Not available	<1	Grab	1 µg/L	GC-MS 1
Simazine	Not available	Not available	Not available	<0.01	Grab	0.01 µg/L	HPLC
Toluene	Not available	Not available	Not available	<1.0	Grab	0.02 µg/L	GC-MS 1
Tributyltin	Not available	Not available	Not available	Not available	Grab	1 µg/L as Sn	GC-MS 1
Xylenes	Not available	Not available	Not available	<1.0	Grab	0.96 µg/L	GC-MS 1
Arsenic	Not available	Not available	Not available		Grab	0.02 mg/L	ICP-MS
Chromium	<20	Not available	<20	<20	Grab	0.02 mg/L	ICP-OES
Copper	<20	Not available	<20	<20	Grab	5 mg/L	ICP-OES
Cyanide	Not available	Not available	Not available	<5	Grab	0.01 µg/L	Colorimetric
Fluoride	Not available	Not available	Not available	<100	Grab	0.1 mg/L	ISE
Lead	<20	Not available	<20	<20	Grab	0.02 mg/L	ICP-OES
Nickel	<20	Not available	<20	<20	Grab	0.02 mg/L	ICP-OES
Zinc	<20	Not available	<20	<20	Grab	0.02 mg/L	ICP-OES
Boron	<20	Not available	<20	<20	Grab	0.02 mg/L	ICP-OES
Cadmium	<20	Not available	<20	<20	Grab	0.02 mg/L	ICP-OES
Mercury	Not available	Not available	Not available	1.1	Grab	0.02 µg/L	ICP-MS
Selenium	Not available	Not available	Not available	1	Grab	0.74 µg/L	ICP-MS
Barium	<20	Not available	32	30	Grab	0.02 mg/L	ICP-OES

## SECTION G1: Compliance with Council Directives

Table G1-1: Table of Attachments

Item	Title	Drg. No.
1*	Cork County Council Wastewater Laboratory Test Report for Wastewater Treatment Plant outlet	Page No. G1-2
3	Table F1-9: Cork County Council Wastewater Laboratory Recorded River Quality upstream of WWTP (Copy of table from Attachment F1)	Page No. G1-6
4	Table F1-10: Cork County Council Wastewater Laboratory Recorded River Quality downstream of WWTP (Copy of table from Attachment F1)	Page No. G1-7
5	Special Area of Conservation: River Blackwater Site Synopsis	Page No. G1-8

\* Cork County Council's Test Report cannot be copied to OCR format

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Laboratory Test Report  
Cork County Council  
Waste Water Laboratory  
Inniscarra, Co. Cork

Page 1 of 1  
July 10, 2008

Industry Name  
Address

Kanturk Sewage Works  
Kanturk,  
Co. Cork

Industry Code No. 310  
Report Ref No. SLW-07-08-160  
Issued to F. Curran  
Co. Water Services Att.

Licence No. Type S

Licence	Volume m3	pH	B.O.D. mg/l	C.O.D. mg/l	Total Solids mg/l	TP-P mg/l	Code	Comments
Licence 11011	99999	8.99	25	125	95	99		
Date								
17/01/07	1543	7.7	3.4	26	10	1.0	GR003	G TP-P=1.7mg/l
08/03/07		7.8	4.6	25	5	0.72	GR210	C TP-P=3.6mg/l
17/05/07	1317	8.0	6.9	37	10	1.63	GR595	C TP-P=13.7mg/l, NH4-N=
21/08/07		7.8	12	36	11	1.1	GR768	C TP-P=6.3mg/l, NH4-N=30mg/l
27/09/07		7.8	7.78	32	11		GR889	C NH4-N=3.7mg/l, TP-P=30mg/l
17/10/07	942	7.9	2.43	26	7		GR987	C TP-P=14.1MG/L
14/02/08		8.3	1.95	23	2.5	0.56	GR107	C NH4-N=0.1mg/l
28/02/08	751	8.0	3.49	37	5	1.11	GR134	C NH4-N=1.0mg/l
05/04/08			1.4	21	2.5	0.66	GR213	C TP-P=0.53mg/l, TP-N=
10/06/08			1.9	<21	40		GR316	C TP-P=3.6mg/l, TP-N=
% Compl	100	100	100	100	90	100	54%	***
Average	1138.25	7.91	4.59	26.30	10.20	0.97	***	***

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 21st Edition 2005, APHA, AWWA, WSP. C = Composite Sample, G = Grab Sample.

The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page. Chemical Procedure Numbers (CP No.) for INAB accredited tests are as follows:  
 CP NO. 1 = B.O.D. CP NO. 3 = S.S. CP NO. 20 = TP-P  
 CP NO. 5 = pH CP NO. 6 = C.O.D. CP NO. 7 = Cl CP NO. 22 = Ammonia (KONELAB)  
 CP NO. 23 = OPO4-P (KONELAB) CP NO. 24 = Chloride (KONELAB) CP NO. 25 = Sulphate (KONELAB)

This report relates only to the samples listed above. This report shall not be reproduced except in full and only with the approval of the testing laboratory. Cork County Council is not accredited by INAB for tests marked with S. Kg loadings based on flows as supplied by the company. -- indicates results that have been diluted.

Reported by: V. Hanlon Date: 10/07/08

Ms. V. Hanlon Technical Manager  
Deputy Technical Manager

CCR 001 Issue No 5 November 2007

**Wastewater Laboratory Cork County Council- Test Report Addendum**

- a. Sample date reported in column 1 on this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
- b. Cork County Council wastewater laboratory are not accredited for sample collection.
- c. Data reported in (d) below is defined in section 5.10.3 (c) in wastewater laboratory quality manual.
- d. Table of Uncertainty Of Measurement – Estimate Of Values For Accredited Tests

Chemical Procedure No.	range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD5)	± 0.2%	mg/l
CP No. 1	9 - 20 mg/l	Biochemical Oxygen Demand (BOD5)	± 2.2	mg/l
CP No. 1	21 - 700 mg/l	Biochemical Oxygen Demand (BOD5)	± 60	mg/l
CP No. 3	35 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	200 - 400 mg/l	Suspended Solids (SS)	± 41.5	mg/l
CP No. 3	700 - 1000 mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 12	pH	± 0.52	pH Units
CP No. 6	< 4 mg/l	Chemical Oxygen Demand (COD LR)	± 5.6	mg/l
CP No. 6	15 - 75 mg/l	Chemical Oxygen Demand (COD LR)	± 10.6	mg/l
CP No. 6	100 - 135 mg/l	Chemical Oxygen Demand (COD LR)	± 17.4	mg/l
CP No. 6	130 - 1500 mg/l	Chemical Oxygen Demand (COD)	± 25.8	mg/l
CP No. 7	5.0 - 135 mg/l	High range Chloride (Cl)	± 0.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Ammonia Phosphorus (TP-P)	± 0.22	mg/l
CP No. 22	0.1 - 0.9 mg/l	Ammonia (Korolab)	± 0.04	mg/l
CP No. 22	1.0 - 2.0 mg/l	Ammonia (Korolab)	± 0.10	mg/l
CP No. 22	3 - 16 mg/l	Ammonia (Korolab)	± 0.32	mg/l
CP No. 22	11 - 19 mg/l	Ammonia (Korolab)	± 0.52	mg/l
CP No. 22	20 - 25 mg/l	Ammonia (Korolab)	± 1.56	mg/l
CP No. 23	0.02 - 1.00 mg/l	Orthophosphate as P (Korolab)	± 0.64	mg/l
CP No. 24	25.00 - 99.00 mg/l	Chloride (Korolab)	± 3.04	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (Korolab)	± 13.16	mg/l
CP No. 25	30.00 - 199.00 mg/l	Sulfate (Korolab)	± 3.42	mg/l
CP No. 25	200.00 - 250.00 mg/l	Sulfate (Korolab)	± 8.79	mg/l

November 2007

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.  
 The method followed is located in the Uncertainty of Measurement file and in the Eurachem Guidelines for Quantifying Uncertainty in Analytical Measurement.



Laboratory Test Report  
Cork County Council  
Waste Water Laboratory  
Inniscarra, Co. Cork

Page 1 of 1  
July 10, 2008

Industry Name: Kanturk Sewage Works  
Address: Kanturk, Co. Cork

Industry Code No. 310  
Report Ref No. SW-02-02 (A)  
Issued to: F. O'Sullivan  
SE: Whitehead

License No. Type S

License	Volume m <sup>3</sup>	pH	B.O.D. mg/l	C.O.D. mg/l	Sus Solids mg/l	TSP mg/l	Code	Comments
Limit	99999	3.99	25	125	35	99		
Date								
17/01/07	1543	7.7	3.4	26	19	1.0	GR003	C TN-NH= 17mg/L
08/03/07		7.8	4.6	25	8	0.72	GR210	C TN-NH= 2.6mg/L
17/05/07	1317	8.0	6.9	37	10	1.63	GR393	C TN-NH= 13.7mg/L THM5= <
21/08/07		7.8	12	36	11	1.1	GR768	C NH3= 6.3mg/L SO4= <30mg
27/09/07		7.8	7.78	32	11		GR889	C NH3= 1.7mg/L SO4= <30mg/L
17/10/07	942	7.9	2.43	26	7		GR987	C TN-NH= 14.1MG/L
% Compl.	100	100	100	100	100	100	***	***
Average	1267.33	7.83	6.19	30.23	9.67	1.11	***.74	***.65

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 21st Edition 2005, APHA, AWWA, WEF. C = Composite Sample, G = Grab Sample.

The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page Chemical Procedure Numbers (CP No.) for INAB accredited tests are as follows:  
 CP NO. 1 = B.O.D. CP NO. 3 = S.S. CP NO. 23 = TP.P  
 CP NO. 5 = pH CP NO. 6 = C.O.D. CP NO. 7 = Cl CP NO. 22 = Ammonia (KONELAB)  
 CP NO. 23 = PO4-P (KONELAB) CP NO. 24 = Chloride (KONELAB) CP NO. 25 = Sulphate (KONELAB)

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Reported by: V. Hanon Date: 10/07/08

Ms. V. Hanon: Technical Manager  
Deputy Technical Manager

CTR 001 Issue No 5 November 2007

**Wastewater Laboratory Cork County Council- Test Report Addendum**

- a. Sample date reported in column 1 on this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
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- c. Data reported in (d) below is defined in section 5.10.3 (c) in wastewater laboratory quality manual.

**d. Table of Uncertainty Of Measurement -- Estimate Of Values For Accredited Tests**

Chemical Procedure No.	range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD)	± 0.30	mg/l
CP No. 1	9 - 70 mg/l	Biochemical Oxygen Demand (BOD)	± 3.3	mg/l
CP No. 1	71 - 700 mg/l	Biochemical Oxygen Demand (BOD)	± 40	mg/l
CP No. 3	25 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	280 - 400 mg/l	Suspended Solids (SS)	± 41.6	mg/l
CP No. 3	700 - 3000 mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 12	pH	± 0.12	pH limits
CP No. 6	< 6 mg/l	Chemical Oxygen Demand (COD) LR	± 5.0	mg/l
CP No. 6	15 - 75 mg/l	Chemical Oxygen Demand (COD) LR	± 10.6	mg/l
CP No. 6	100 - 175 mg/l	Chemical Oxygen Demand (COD) LR	± 17.4	mg/l
CP No. 6	120 - 1500 mg/l	Chemical Oxygen Demand (COD) High Range Chloride (CR)	± 26.8	mg/l
CP No. 7	5.0 - 12.5 mg/l	Ortho Phosphorus (TP) High Range Chloride (CR)	± 0.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Ortho Phosphorus (TP)	± 0.22	mg/l
CP No. 22	0.1 - 0.9 mg/l	Ammonia (Kanalab)	± 0.04	mg/l
CP No. 22	1.0 - 2.0 mg/l	Ammonia (Kanalab)	± 0.10	mg/l
CP No. 22	2 - 10 mg/l	Ammonia (Kanalab)	± 0.32	mg/l
CP No. 23	11 - 19 mg/l	Ammonia (Kanalab)	± 0.72	mg/l
CP No. 22	20 - 25 mg/l	Ammonia (Kanalab)	± 1.56	ug/l
CP No. 23	0.25 - 1.00 mg/l	Orthophosphoric as P (Kanalab)	± 0.04	mg/l
CP No. 24	25.00 - 99.00 mg/l	Chloride (Kanalab)	± 3.84	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (Kanalab)	± 11.16	ug/l
CP No. 25	30.00 - 150.00 mg/l	Sulphate (Kanalab)	± 3.42	mg/l
CP No. 25	200.00 - 350.00 mg/l	Sulphate (Kanalab)	± 8.70	mg/l

November 2007

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.

The method followed is located in the Uncertainty of Measurement file and in the Eurachem Guidelines for Quantifying Uncertainty in Analytical Measurement.

**Table F1-9: River Allow Water Quality (Upstream of Kanturk WWTP)**

Sample Date	17/01/2007	08/03/2007	21/08/2007	27/09/2007	14/02/2008	28/02/2008	03/04/2008	10/04/2008
Sample	river	river	river	river	River	River	River	river
Flow M <sup>3</sup> /Day	7.6	7.3	7.9	7.6	8.1	8	*	*
pH	*	*	*	*	*	*	*	*
Temperature °C	*	*	*	*	*	*	*	*
Cond 20°C	5	7	5	4	4	<2.5	148	166
SS mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	*	<0.1
NH <sub>3</sub> mg/L	<1	<1	1.2	1.04	1.57	<1	<1.0	<1
BOD mg/L	*	<21	*	*	*	*	*	*
COD mg/L	2.5	3.7	*	3.4	*	2.03	*	*
TN mg/L	*	*	*	*	*	*	*	*
Nitrite mg/L	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*
TP mg/L	<0.2	<0.2	0.32	0.3	<0.2	<0.2	<0.20	<0.2
0-P04-P mg/L	*	*	<0.05	<0.05	<0.05	0.05	*	<0.05
SO <sub>4</sub> mg/L	*	*	<30	<30	<30	<30	*	*
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Copper mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	*	*	*	*	*
Fluoride	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	<0.02	0.021	<0.02	<0.02
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron mg/L	*	*	*	*	<0.02	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	*	*	*	*	*
Selenium µg/L	*	*	*	*	*	*	*	*
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

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**Table F1-10: River Allow Water Quality (Downstream of Kanturk WWTP)**

Sample Date	17/01/2007	08/03/2007	21/08/2007	27/09/2007	14/02/2008	28/02/2008	05/04/2008	10/04/2008
Sample	river	river	river	river	River	River	River	river
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	*
pH	7.5	7.3	8.1	8	8.1	7.9	*	*
Temperature °C	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	159	165
SS mg/L	*	6	*	*	<2.5	9	<2.5	<2.5
NH <sub>3</sub> mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BOD mg/L	<1	<1	<1	1.1	1.56	1.17	<1.0	<1
COD mg/L	*	<21	*	*	*	*	*	*
TN mg/L	3.2	2.9	9	4.4	*	2.38	2.7	*
Nitrite mg/L	*	*	*	*	*	*	*	*
Nitrate mg/L	*	*	*	*	*	*	*	*
TP mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	*
O-PO4-P mg/L	*	*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SO4 mg/L	*	*	<30	<30	<30	<30	*	*
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	*	*	*	*	*	*	*	*
Fluoride	*	*	*	*	*	*	*	*
Lead mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*
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	*
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*
Mercury µg/L	*	*	*	*	*	*	*	*
Selenium µg/L	*	*	*	*	*	*	*	*
Barium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	*

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## 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, Broccan, Rathcool, Finnow, Owenaraglin 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, Rathormac, Tallow, Listmore, 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 of Malinow. The valley deepens as first the Nagles Mountains and then the Knockmealton Hills 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, Twaité 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 Drumana, 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 menziesii*). 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 woodlands. 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 (*Menha 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 water table 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.), Canalflap 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 *Fountainalis 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 Amragh Bog on the Awbeg. These fields are dominated by Tuffed 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 Ballinacree, 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 Rucraw, Carrigac, Glendiac, Newport and Droghada. 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 (*Adiantum filix-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 (*Labaria* 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 (*Orobanchae hederacae*), 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 Benaglanna 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 sedge 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 *Autacomnium palustre*. The cover is a sedge with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Marsh Orchid (*Dactylorhiza invarnata*).

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 ranch tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow (*Salix cinerea* subsp. *oleifolia*) and Downy Birch. The ground in the clearings is heavily 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 1 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 Campfire 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 (*Hallimione portulacoides*) - the latter a very recent coloniser - at the edges. Some Sea Asier (*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 (*Linum* 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 (*Critinum maritimum*), Sandwort (*Hanckya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glaberrimula*). Other species present include Sea Rocket (*Cakile maritima*), Herb Robert (*Geranium robertianum*), Red Fescue (*Festuca rubra*) and Kidney Vetch (*Anhyllis vulneraria*). The top of the spit is more vegetated and includes lichens and bryophytes (including *Tortula ruraliformis* and *Rhyidiadelphus 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-moss (*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*), Twaité 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 Fernoy and is very highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fernoy 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, *Metricoptera roseifl* (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; 4 pairs at Ardsallagh Wood and c. 20 pairs at Ringrow 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 rookeries present at Ardsallagh Wood, downstream of Stranecally 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 Castlhyde 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 stiles 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 Avbeg, overgrazing within the woodland areas, and invasion by non-native species, for example Chetry 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 Cailows 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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13.09.2006



**SECTION G2: Compliance with Water Quality Standards for Phosphorous Regulations (S.I. 258 of 1998)**

Table G2-1: Table of Attachments

<b>Item</b>	<b>Title</b>	<b>Drg. No.</b>
1	Cork County Council Wastewater Laboratory Test Report for Wastewater Treatment Plant outlet	Page No. G2- 2
2	Copy of Table F1-8: Kanturk WWTP Assimilative Capacity Assessment from Attachment F1	Page No. G2- 6

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Laboratory Test Report  
Cork County Council  
Waste Water Laboratory  
Inniscarra, Co. Cork

Page 1 of 1  
July 10, 2008

Industry Name: Kanturk Sewage Works  
Address: Kanturk, Co. Cork

Industry Code No. 310  
Report Ref No. SL0-09-08-169  
Issued to: E. O'Sullivan  
City Water Services Unit

Licence No. Type S

Licence Limit	Volume m3	pH	B.O.D. mg/l	C.O.D. mg/l	Sus Solids %/wt	TP-P mg/l	Code	Comments
	99999	3.99	25	125	35	95		
Date								
17/01/07	1543	7.7	3.4	26	10	1.0	GR003	C TN-N5=17mg/l
08/03/07		7.8	4.6	25	8	0.72	GR210	C TN-N5=8.6mg/l
17/05/07	1317	8.0	6.9	37	10	1.63	GR395	C TN-N5=13.7mg/l, TP-P=
21/08/07		7.8	12	36	14	1.1	GR768	C NH3-N=6.3mg/l, S04-P=30mg/l
27/09/07		7.8	7.78	32	14		GR889	C NH3-N=3.7mg/l, S04-P=36mg/l
17/10/07	942	7.9	2.49	26	7		GR987	C TN-N5=14.10mg/l
14/02/08		8.3	1.95	23	<2.5	0.5	GS197	C NH3-N=<0.1mg/l
28/02/08	751	8.0	3.49	37	5	1.1	GS134	C NH3-N=1.9mg/l
03/04/08			1.4	21	3.5	0.66	GS243	C OPO4-P=0.53mg/l, TN-N5=
10/04/08			1.9	<21	4.4		GS316	C OPO4-P=0.66mg/l, TN-N5=
% Compl.	100	100	100	100	90	100	***	***
Average	115K28	7.91	4.59	26.26	10.20	0.97	***	***

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 21st Edition 2005, APHA, AWWA, WSP. C = Composite Sample, G = Grab Sample. The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page. Chemical Procedure Numbers (CP No.) for INAB accredited tests are as follows:  
 CP NO. 1 = B.O.D. CP NO. 3 = S.S. CP NO. 20 = TP-P  
 CP NO. 5 = pH CP NO. 6 = C.O.D. CP NO. 7 = Cl CP NO. 22 = Ammonia (KONELAB)  
 CP NO. 21 = OPO4-P (KONELAB) CP NO. 24 = Chloride (KONELAB) CP NO. 25 = Sulphate (KONELAB)  
 This report relates only to the samples listed above. This report shall not be reproduced except in full and only with the approval of the testing laboratory. Cork County Council is not accredited by INAB for tests marked with \$. Kg loadings based on flows as supplied by the company. ~ indicates results that have been edited.

Reported by: V. Hanon Date: 10/07/08

Ms. V. Hanon Technical Manager  
Deputy Technical Manager

CTR 067 Issue No 5 November 2007

### Wastewater Laboratory Cork County Council- Test Report Addendum

- a. Sample date reported in column 1 of this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
- b. Cork County Council wastewater laboratory are not accredited for sample collection.
- c. Data reported in (d) below is defined in section 5.10.3 (c) in wastewater laboratory quality manual.
- d. Table of Uncertainty Of Measurement – Estimate Of Values For Accredited Tests

Chemical Procedure No.	Range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD)	± 0.50	mg/l
CP No. 1	9 - 70 mg/l	Biochemical Oxygen Demand (BOD)	± 3.2	mg/l
CP No. 1	71 - 700 mg/l	Biochemical Oxygen Demand (BOD)	± 40	mg/l
CP No. 2	55 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	200 - 400 mg/l	Suspended Solids (SS)	± 41.6	mg/l
CP No. 3	700 - 1400 mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 13	pH	± 0.12	pH Units
CP No. 6	< 4 mg/l	Chemical Oxygen Demand (COD LR)	± 5.6	mg/l
CP No. 6	15 - 75 mg/l	Chemical Oxygen Demand (COD LR)	± 10.6	mg/l
CP No. 6	100 - 135 mg/l	Chemical Oxygen Demand (COD LR)	± 17.4	mg/l
CP No. 6	140 - 160 mg/l	Chemical Oxygen Demand (COD)	± 26.8	mg/l
CP No. 7	5.0 - 135 mg/l	Chloride (Cl)	± 9.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Free Phosphorus (F-P)	± 0.23	mg/l
CP No. 22	0.1 - 0.5 mg/l	Ammonia (Kometab)	± 0.04	mg/l
CP No. 22	1.0 - 2.0 mg/l	Ammonia (Kometab)	± 0.10	mg/l
CP No. 22	2 - 10 mg/l	Ammonia (Kometab)	± 0.32	mg/l
CP No. 22	11 - 19 mg/l	Ammonia (Kometab)	± 0.72	mg/l
CP No. 22	20 - 25 mg/l	Ammonia (Kometab)	± 1.56	mg/l
CP No. 23	0.05 - 1.00 mg/l	Orthophosphate as P (Kometab)	± 0.04	mg/l
CP No. 24	25.00 - 99.00 mg/l	Chloride (Kometab)	± 7.64	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (Kometab)	± 11.16	mg/l
CP No. 25	30.00 - 199.00 mg/l	Sulphate (Kometab)	± 3.92	mg/l
CP No. 25	200.00 - 250.00 mg/l	Sulphate (Kometab)	± 8.76	mg/l

November 2007

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.

The method followed is located in the Uncertainty of Measurement file asd in the Barachem Guidelines for Quantifying Uncertainty in Analytical Measurement.



Laboratory Test Report  
 Cork County Council  
 Waste Water Laboratory  
 Inniscarra, Co. Cork

Page 1 of 1  
 July 10, 2008

Industry Name: Kanturk Sewage Works  
 Address: Kanturk, Co. Cork

Industry Code No. 310  
 Report Ref No. 500-02-02-190  
 Issued to: E. Cronin  
 By: Walter Sweeney

License No.	Type	S							
Volume m <sup>3</sup>	pH	B.O.D. mg/l	C.O.D. mg/l	Sus Solids mg/l	TP-P mg/l	Chlor	Comments		
1701/07	1543	7.7	3.4	26	10	1.0	GR003 C TN-N5=17mg/L		
08/03/07		7.8	4.6	25	8	0.72	GR240 C TN-N5=8.6mg/L		
17/05/07	1317	8.0	6.9	37	10	1.63	GR393 C TN-N5=13.7mg/L TH-N5=C1		
21/08/07		7.8	1.2	36	11	1.1	GR768 C N-N5=6.3mg/L S04P=C00mg		
27/09/07		7.8	2.78	32	11		GR889 C N-N5=3.7mg/L S04=C38mg/L		
17/10/07	942	7.9	2.43	26	7		GR987 C TN-N5=14.1mg/L		
% Compl	100	100	100	100	100	***	***		
Average	1267.53	7.83	4.19	30.33	9.88	1.13	***, **		

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 21st Edition 2005, APHA, AWWA, WEF. C = Composite Sample, G = Grab Sample.  
 The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page Chemical Procedure Numbers (CP No.) for INAB accredited tests are as follows:  
 CP NO. 1 = B.O.D. CP NO. 3 = S.S. CP NO. 20 = TP-P CP NO. 27 = Ammonia (KONELAB)  
 CP NO. 5 = pH CP NO. 6 = C.O.D. CP NO. 7 = Cl CP NO. 25 = Sulphate (KONELAB)  
 CP NO. 25 = OP04-P (KONELAB) CP NO. 24 = Chloride (KONELAB)

This report relates only to the samples listed above. This report shall not be reproduced except in full and only with the approval of the testing laboratory. Cork County Council is not accredited by INAB for tests marked with S. Kg loadings based on flows as supplied by the company. \* indicates results that have been edited.

Reported by: V. Hannon Date: 10/7/08

368, V. Hannon Technical Manager  
 Deputy Technical Manager

CIW 001 Issue No 5 November 2007

### Wastewater Laboratory Cork County Council- Test Report Addendum

- Sample date reported in column 1 on this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
- Cork County Council wastewater laboratory are not accredited for sample collection.
- Data reported in (d) below is defined in section 5.10.3 (v) in wastewater laboratory quality manual.
- Table of Uncertainty Of Measurement – Estimate Of Values For Accredited Tests

Chemical Procedure No.	range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD)	± 0.30	mg/l
CP No. 1	9 - 20 mg/l	Biochemical Oxygen Demand (BOD)	± 1.2	mg/l
CP No. 1	21 - 200 mg/l	Biochemical Oxygen Demand (BOD)	± 6.0	mg/l
CP No. 3	25 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	260 - 400 mg/l	Suspended Solids (SS)	± 11.6	mg/l
CP No. 3	760 - 1000 mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 12	pH	± 0.12	pH Units
CP No. 6	< 6 mg/l	Chemical Oxygen Demand (COD LR)	± 5.6	mg/l
CP No. 6	15 - 25 mg/l	Chemical Oxygen Demand (COD LR)	± 10.6	mg/l
CP No. 6	160 - 135 mg/l	Chemical Oxygen Demand (COD LR)	± 37.4	mg/l
CP No. 6	120 - 1500 mg/l	Chemical Oxygen Demand (COD)	± 36.8	mg/l
CP No. 7	5.0 - 125 mg/l	High Range Chloride (Cl <sub>2</sub> )	± 6.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Total Phosphorus (TP-P)	± 0.22	mg/l
CP No. 23	0.1 - 0.9 mg/l	Ammonia (Kometab)	± 0.04	mg/l
CP No. 23	1.0 - 2.6 mg/l	Ammonia (Kometab)	± 0.10	mg/l
CP No. 23	2 - 30 mg/l	Ammonia (Kometab)	± 0.30	mg/l
CP No. 23	11 - 19 mg/l	Ammonia (Kometab)	± 0.72	mg/l
CP No. 23	20 - 25 mg/l	Ammonia (Kometab)	± 1.56	mg/l
CP No. 23	0.55 - 1.00 mg/l	Cytophosphate as P (Kometab)	± 0.04	mg/l
CP No. 24	25.00 - 80.00 mg/l	Chloride (Kometab)	± 3.04	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (Kometab)	± 11.10	mg/l
CP No. 25	30.00 - 150.00 mg/l	Sulphate (Kometab)	± 3.42	mg/l
CP No. 25	200.00 - 250.00 mg/l	Sulphate (Kometab)	± 8.70	mg/l

November 2007

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.

The method followed is located in the Uncertainty of Measurement fit and in the Eurachem Guidelines for Quantifying Uncertainty in Analytical Measurement.

**Table F1-8: Kanturk Assimilative Capacity Assessment**

P.E.	Parameter	Receiving waters Background concentration	Upstream		WWTP		Downstream Water Quality		Receiving Water Quality Limiting Value (see note 1 below)	Q- Rating
			Upstream River Flow See Note 1 below		Discharge Flow	Effluent Discharge Standard	Flow	Expected Water Quality		
			l/s	m <sup>3</sup> /d	m <sup>3</sup> /d	mg/l	m <sup>3</sup> /d	mg/l		
17/01/2007	BOD	1	400.00	34560.00	1543	3.40	36103.00	1.10	2	Q4
	SS	3.5	400.00	34560.00	1543	10.00	36103.00	3.78	25	
	Phosphorus	0.025	5060.00	437184.00	1543	-	438727.00	-	0.03	
17/05/2007	BOD	1	400.00	34560.00	1317	6.90	35877.00	1.22	2	Q4
	SS	3.5	400.00	34560.00	1317	10.00	35877.00	3.74	25	
	Phosphorus	0.025	5060.00	437184.00	1317	-	438501.00	-	0.03	
17/10/2007	BOD	1	400.00	34560.00	942	2.43	35502.00	1.04	2	Q4
	SS	3.5	400.00	34560.00	942	7.00	35502.00	3.59	25	
	Phosphorus	0.025	5060.00	437184.00	942	1.48	438126.00	0.028	0.03	
28/02/2008	BOD	1	400.00	34560.00	751	3.49	35311.00	1.05	2	Q4
	SS	3.5	400.00	34560.00	751	5.00	35311.00	3.53	25	
	Phosphorus	0.025	5060.00	437184.00	751	0.97	437935.00	0.027	0.03	
17/07/2008	Atrazine	0.000005	280.00	24192.00	1016	0.00001	25208.00	0.00001	0.001	Q4
	Dichloromethane	0.0005	280.00	24192.00	1016	0.00050	25208.00	0.00050	0.01	
	Simazine	0.000005	280.00	24192.00	1016	0.00001	25208.00	0.00001	0.001	
	Xylenes	0.0005	280.00	24192.00	1016	0.00050	25208.00	0.00050	0.01	
	Arsenic	0.001	280.00	24192.00	1016	0.00048	25208.00	0.00098	0.025	
	Copper	0.00001	280.00	24192.00	1016	0.01000	25208.00	0.00041	0.005	
	Cyanide	0.0025	280.00	24192.00	1016	0.00250	25208.00	0.00250	0.01	
	Lead	0.01	280.00	24192.00	1016	0.02300	25208.00	0.01052	0.005	
	Nickel	0.01	280.00	24192.00	1016	0.01000	25208.00	0.01000	0.008	
	Zinc	0.01	280.00	24192.00	1016	0.01000	25208.00	0.01000	0.05	
<b>Note 1:</b>	Median Flow is used to calculate assimilative capacity for Orthophosphate, DWF is used for dangerous substances and 95%-ile flow is used for all other substances.									
	BOD limiting value is based on the BOD background + 1mg/l as recommended by Royal Commission in it's report on Water Quality Guidelines.									
	SS limiting value is 25mg/l which is based on the Freshwater Fish Directive in the absence of alternative guidance.									
	Phosphorus standard for a Q4 rated river is 0.03mg/l.									
	Limiting Values for dangerous substances from Dangerous Substances Act 2001 (based on River Allow CaCO3 content <100mg/l)									

MCW0543

G.2-06

Rev. A01

Kanturk and Environs

WWDL Application