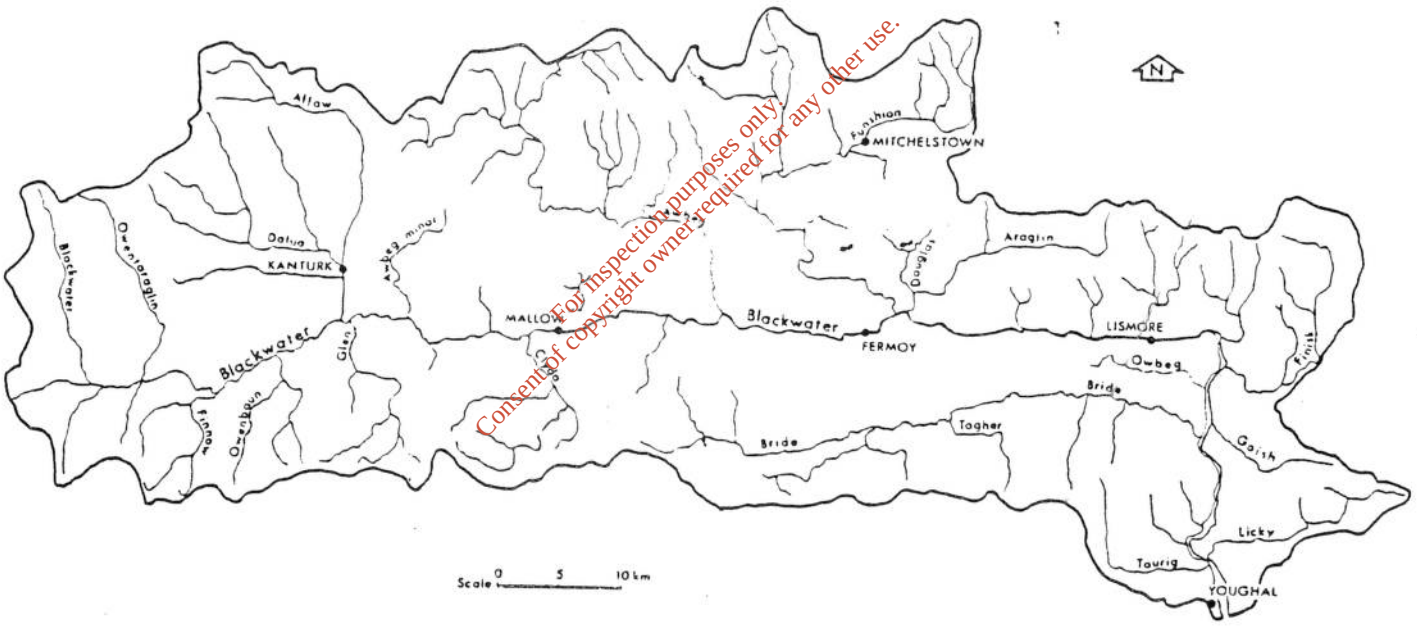
DRAFT WATER QUALITY MANAGEMENT PLAN

FOR

THE MUNSTER BLACKWATER CATCHMENT



THE BLACKWATER CATCHMENT

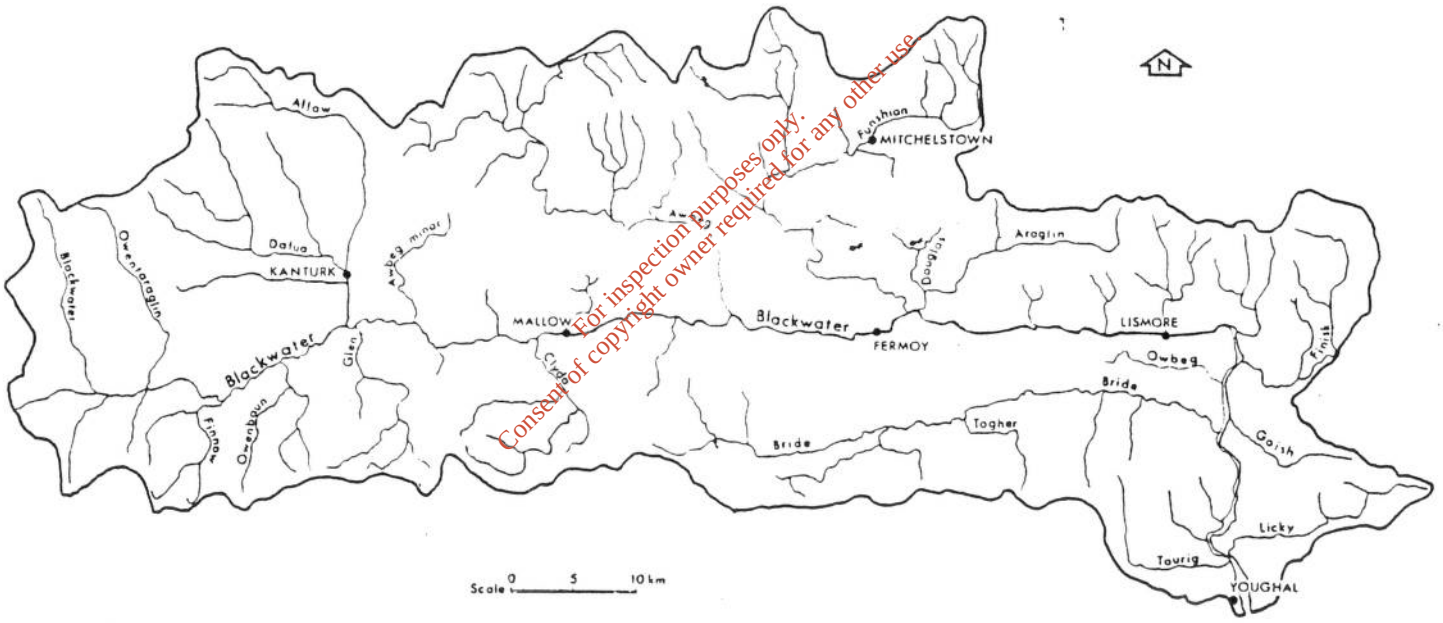
VOLUME 3

ABSTRACTIONS AND DISCHARGES

DRAFT WATER QUALITY MANAGEMENT PLAN

FOR

THE MUNSTER BLACKWATER CATCHMENT



THE BLACKWATER CATCHMENT

VOLUME 3

ABSTRACTIONS AND DISCHARGES

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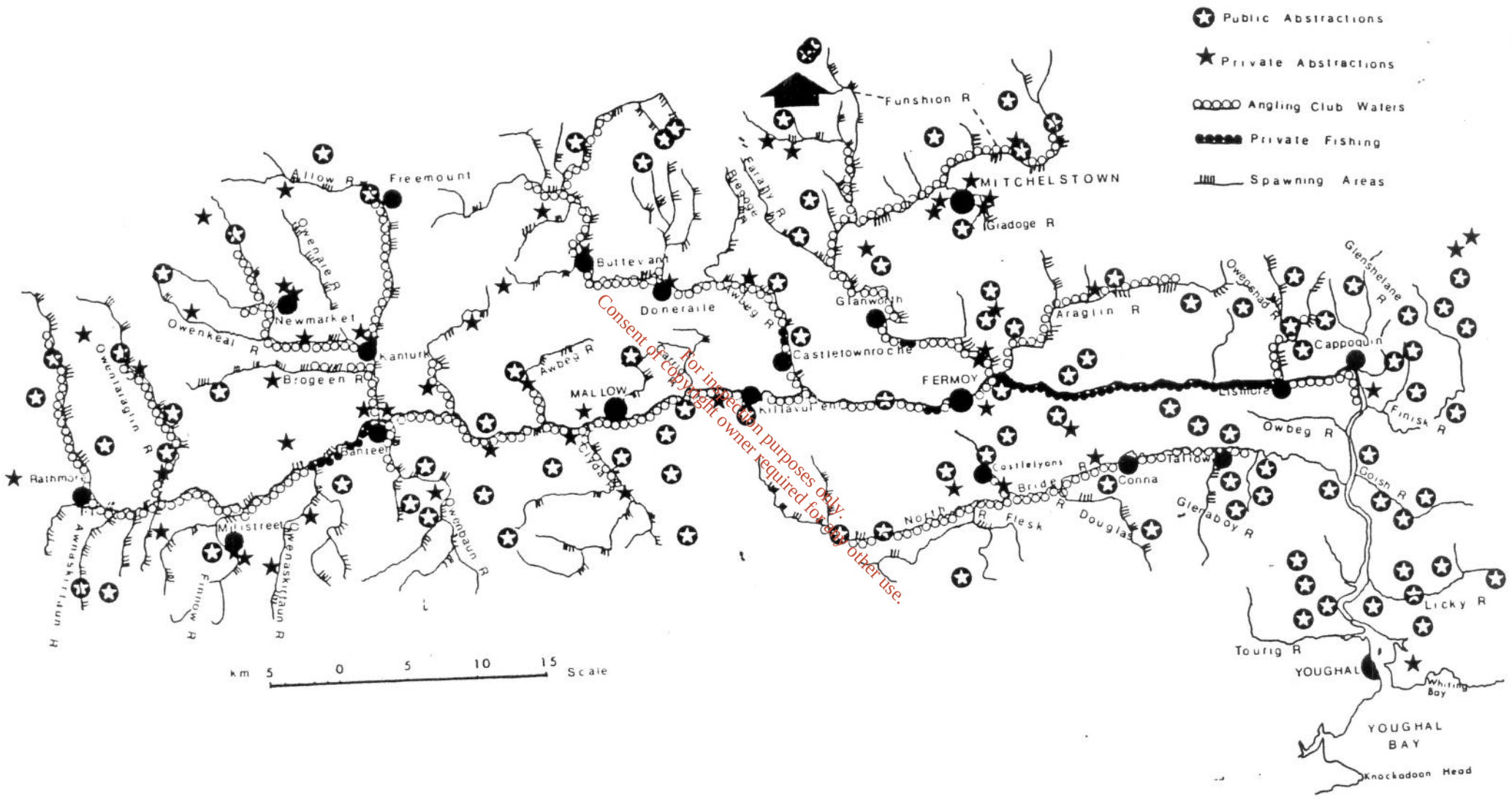

Fig. 1 - Surface Water Abstraction, Salmonid Spawning Areas and Locations of Private Angling Club and Fishing Waters in the River Blackwater and Tributaries (formerly Lismore Fishery District and now part of Southern Regional Fisheries Board).

PUBLIC ABSTRACTIONS

TABLE 3.1 PUBLIC ABSTRACTIONS

Scheme Name	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
** Type of Abstraction: ARTESIAN WELL					
BALLYHEA	C	AWBEG	ARTESIAN WELL	SHINANAGH	772.00
** Type of Abstraction: BORE					
JAMESTOWN	C	AWBEG	BORE	JAMESTOWN	1182.00
GRANGE - JOHNSTOWN	C	FUNSHION	BORE	DOWNING BR.	727.00
KILWORTH	C	FUNSHION	BORE	DOWNING BR.	545.00
KILDORRERY (2)	C	FUNSHION	BORE	GLENAVUDDIG	360.00
KILLAVULLEN	C	BLACKWATER	BORE	BALLYMACMOY	347.00
BALLYVINITER	C	BLACKWATER	BORE	BALLYVINITER & OLIVERS X	250.00
RATHMORE	K	AWNASKIRTAUN	BORE	GORTNAGANE	182.00
LAURENTUM	W	LICKY	BORE	LAURENTUM	115.00
CLONMEEN	C	BLACKWATER	BORE	BANTEER	91.00
TULLYLEASE	C	ALLOW	BORE	JONES X-ROADS	82.00
CAPPAGH	W	FINISK	BORE	CAPPAGH	40.00
PALLAS GROUP	C	BLACKWATER	BORE	CARRIGANE	36.37
MOANIG - BALLYDA	C	BRIDE	BORE	MOANIG	36.00
TOORANEENA	W	FINISK	BORE	TOORANEENA	25.00
MODDIGO	W	FINISK	BORE	NEWTOWN	23.00
AGLISH(GLENCAIRNE)	W	BRIDE	BORE	COOLYDOODY	23.00
BOOLAVONTEEN	W	FINISK	BORE	BOOLAVONTEEN	20.00
BALLYMOATE	W	BRIDE	BORE	BALLYMOATE	20.00
GRALLAGH	W	LICKY	BORE	GRALLAGH	20.00
CAMPHIRE	W	BRIDE	BORE	CAMPHIRE	16.00
GEDISH	W	GOISH	BORE	GEDISH	14.00
BARRACK	C	CLYDAGH	BORE	BOTTLEHILL	14.00
STRANCALLY	W	BLACKWATER	BORE	STRANCALLY	14.00
BALLYCURRANE	W	LICKY	BORE	BALLYCURRANE	14.00
UPPER QUARTERTOWN	C	CLYDAGH	BORE	UPPER QUARTERTOWN X	13.64
KILMORE-KILBEG	W	BRIDE	BORE	KILMORE	12.00
GLENAWILLIN	W	BRIDE	BORE	GLENAWILLIN	10.00
KEREEN	W	FINISK	BORE	KEREEN	10.00
LACKEN	W	FINISK	BORE	MOORE'S WELL	8.00
TINABINNA	W	BLACKWATER	BORE	TIKNOCK (KINSALEBEG)	7.00
LACKEN	W	FINISK	BORE	GLENSHELANE	7.00
UPR. DROMORE	W	GOISH	BORE	DROMORE	5.00
TAUR	C	ALLOW (DALUA)	BORE	TAUR	5.00
LISMORE-CAPPOQUIN-BLYDUFF	W	GLENSHELANE	BORE	SHANBALLY	1.00
LISMORE-CAPPOQUIN-BLYDUF	W	BLACKWATER	BORE	LEFANTE	1.00
Ballydonard	"	"	"	Ballydonard	
** Type of Abstraction: BORE & INDIAN WELL					
BWEEING & MONKEY BRIDGE	C	CLYDAGH	BORE & INDIAN WELL	BWEEING	14.00
** Type of Abstraction: BORE (3 No.)					
CHARLEVILLE	C	AWBEG	BORE (3 No.)	BALLYNAGERAGH	2300.00
** Type of Abstraction: BORE (PP)					
KILTRISLANE-BALLYBEG	C	GRADOGE	BORE (PP)	KILLTRISLANE	3200.00
LABBAMOLAGA	C	SHEEP RIVER	BORE (PP)	LABBAMALOGGA	60.55

TABLE 3.1

PUBLIC ABSTRACTIONS

Scheme Name	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
KILMURRY	C	BLACKWATER	BORE (PP)	KILMURRY	60.00
KILCLARE	C	BRIDE	BORE (PP)	KILCLARE	55.00
KILMAGNER	C	BRIDE	BORE (PP)	KILMAGNER	50.72
MACRONEY	C	ARAGLIN	BORE (PP)	MACRONEY	46.00
GLENLEIGH	C	AWNASKIRTAUN	BORE (PP)	GLENLEIGH	45.66
MONEE - KNOCKBRACK	C	CLYDAGH	BORE (PP)	MONEE X	41.18
ROSKEEN	C	BLACKWATER	BORE (PP)	ROSKEEN	36.75
KNOCKNALOMAN	C	BLACKWATER	BORE (PP)	CAHERBARNAGH	36.29
GORTNASKEHY	C	ARAGLIN	BORE (PP)	ARAGLIN	31.44
BALLYELLIS	C	BLACKWATER	BORE (PP)	BALLYELLIS (UDC)	29.24
CASTLEWRIXON	C	AWBEG	BORE (PP)	CASTLEWRIXON	26.61
GORTNAGRAIGA	C	CLYDAGH	BORE (PP)	GORTNAGRAIGA	26.40
BOHERASCRUB	C	AWBEG	BORE (PP)	BOHERASCRUB	23.33
CARRIGCLEENA MORE	C	CLYDAGH	BORE (PP)	CARRIG CLEENA	22.02
LYREVOICANE	C	FINNOW	BORE (PP)	DERRINAGREE	21.03
MOUNTAIN BARRACK	C	ARAGLIN	BORE (PP)	MOUNTAIN BARRACK	21.03
KNOCKSKAVANE	C	ALLOW	BORE (PP)	KNOCKSKAVANE	19.37
MONAPARSON	C	CLYDAGH	BORE (PP)	MONAPARSON	17.25
KILDINAN (1)	C	BRIDE	BORE (PP)	GLANNAGAUL	16.00
LAGHT	C	OWENBAUN	BORE (PP)	LAGHT	15.26
KNOCKDROMACLOGH	C	BLACKWATER	BORE (PP)	KNOCKDROMACLOGH	15.00
MOANABRICKA	C	MAIGUE	BORE (PP)	MOANABRICA	13.98
BALLYNAMONA	C	CLYDAGH	BORE (PP)	DROMORE	13.02
SCRAHAN	C	BLACKWATER	BORE (PP)	KNOCKNAGREE	11.82
MOYDILLIGA	C	BRIDE	BORE (PP)	BROWNSTONE CROSS	10.20
COOLNAGILLAGH UPPER	C	BLACKWATER	BORE (PP)	COOLNAGILLAGH	10.04
KNOCKERAGH	C	ALLOW	BORE (PP)	KNOCKERAGH	9.71
CASTLECOOKE	C	ARAGLIN	BORE (PP)	CASTLECOOKE	9.12
KILCASKIN	C	ALLOW	BORE (PP)	KILCASKIN	7.01
COOLE LOWER	C	BRIDE	BORE (PP)	COOLE	6.93
DROMCUMMER	C	BLACKWATER	BORE (PP)	DROMCUMMER	4.65
BALLYBROWNEY	C	BRIDE	BORE (PP)	BALLYBROWNEY MOUNTAIN	3.28
KNOCKANEVIN	C	SHEEP RIVER	BORE (PP)	KNOCKANEVIN	2.20
LYRE-ARAGLIN	C	ARAGLIN	BORE (PP)	LYRE	0.46
** Type of Abstraction: BORED WELL					
BALLYDESMOND	C	BLACKWATER	BORED WELL	U/S BALLYDESMOND BR.	90.00
** Type of Abstraction: INFILTRATION GLLRY					
FERMOY URBAN	C	BLACKWATER	INFILTRATION GLLRY	CREGG	3005.00
** Type of Abstraction: RIVER					
ALLOW REGIONAL	C	ALLOW	RIVER	FREEMOUNT	2496.00
MALLOW URBAN	C	CLYDAGH	RIVER	CLYDAGH BRIDGE	2273.00
YOUGHAL	W	GLENDINE	RIVER	GLENDINE RIVER	1920.00
MITCHELSTOWN (2)	C	FUNSHION	RIVER	GALTEE MOUNTAINS	1820.00
LISMORE-CAPPOQUIN-BLYDUFF	W	OWENASHAD	RIVER	ROUGH GLEN, GLENAKEEFFE	820.00
CONNA REGIONAL	C	BRIDE	RIVER	BRIDE BRIDGE	780.00
YOUGHAL	W	GLENDINE	RIVER	GLENDINE RIVER	720.00

TABLE 3.1 PUBLIC ABSTRACTIONS

Scheme Name	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
TALLOW	W	BRIDE	RIVER	KILBEG	200.00
** Type of Abstraction: RIVER & SPRINGS					
BANTEER - KNOCKBRACK	C	BLACKWATER	RIVER & SPRINGS	KNOCKBRACK	360.00
** Type of Abstraction: RIVER (Stream)					
KILDORRERY (1)	C	FUNSHION	RIVER (Stream)	BALLYVISTEEN	70.00
** Type of Abstraction: SPRING					
NEWMARKET - KANTURK	C	ALLOW (DALUA)	SPRING	BALLINATONA	5910.00
KETRAGH	C	AWBEG	SPRING	KETRAGH	5909.00
DONERAILE-SHANBALLYMORE	C	AWBEG	SPRING	SHANBALLYMORE	2045.00
MILLSTREET (1)	C	FINNOW	SPRING	TUBRID WELL	1588.00
CASTLETOWNROCHE	C	AWBEG	SPRING	CASTLETOWNROCHE	1386.00
MOUNTHNORTH	C	AWBEG MINOR	SPRING	MOUNTNORTH	838.00
GLANWORTH - BALLYENIHAN	C	FUNSHION	SPRING	BALLYKENLY	680.00
MITCHELSTOWN (1)	C	GRADOGE	SPRING	GLENATLUCKY	488.00
HEATHERSIDE	C	AWBEG	SPRING	BALLYHOURA HILLS	318.00
SCARTEEN	C	DALUA	SPRING	BALLINATONA	300.00
CONNA	C	BRIDE	SPRING	KILCLANE UPR.	273.00
GLANTANE	C	BLACKWATER	SPRING	LAHARN	182.00
BALLYDUFF-BALLYLEMON	W	FINISK	SPRING	GLENAVADDRA	115.00
MILLSTREET (2)	C	BLACKWATER	SPRING	CAHERBARNAGH	109.00
KNOCKNAGREE	C	BLACKWATER	SPRING	KNOCKNAGREE	90.92
CULLEN	C	OWENTARAGLIN	SPRING	MULLAGHROE	90.00
BALLYMAGOOLY	C	BLACKWATER	SPRING	DROMRAHAN	68.00
VILLIERSTOWN	W	BLACKWATER	SPRING	DROMANA WOOD	55.00
KILDINAN (2)	C	BRIDE	SPRING	SHANBALLY HOUSE	54.00
KISKEAM	C	OWENTARAGLIN	SPRING	KISKEAM BR.	41.00
CREGANE-GORTMORE	C	BLACKWATER	SPRING	CREGANE X	40.91
AGHLISH (DUNGARVAN)	W	GOISH	SPRING	BALLAILANE	40.00
NEWCASTLE RD-MT MELLARY	W	GLENFALLIA	SPRING	GLENFALLIG BRIDGE	25.00
WATERGRASSHILL	C	BRIDE	SPRING	WATERGRASSHILL	25.00
RAHAN	C	BLACKWATER	SPRING	FIDDANE	23.00
BALLYHEAPHY	W	GLENMORE	SPRING	KNOCKACULLEN	20.00
TALLOW HILL	W	BRIDE	SPRING	TALLOWBRIDGE	20.00
CARRAIGNAGOWER	W	OWENASHAD	SPRING	CARRIGNAGOWER	20.00
CLASHMORE	W	LICKY	SPRING	BALLYNAMULTINA	20.00
KILCOONEY	W	FINISK	SPRING	KILCOONEY	20.00
INCHINLLAMY	W	ARAGLIN (BW?)	SPRING	TOBERAHULLA	15.00
BALLYNOE	W	GLENFALLIA	SPRING	BALLYNOE	15.00
SHEAN	W	BLACKWATER	SPRING	SHEAN	10.00
BALLYSAGGART	W	GLENMORE	SPRING	FEAGARRID	10.00
LYRE	C	LYRE	SPRING	LYRE	9.10
NADD	C	GLEN	SPRING	NADD	9.10
MEELIN	C	ALLOW (DALUA)	SPRING	MEELIN	5.00
Kilbolly	C	Douglas (Argh)	Spring	Kilcourt (2Km N.)	23.00

TABLE 3.1

PUBLIC ABSTRACTIONS

Scheme Name	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
** Type of Abstraction: SPRING & BORE					
BALLYNOE	C	BRIDE	SPRING & BORE	BOOLADURRAGHA	90.82
DROMAHANE & KILCOLMAN	C	CLYDAGH	SPRING & BORE	DROMAHANE	68.00
BARTLEMY	C	BRIDE	SPRING & BORE	MOANIG	63.00
** Type of Abstraction: SPRINGS					
TOOREEN	C	GLEN	SPRINGS	TOOREEN	23.00
** Type of Abstraction: WELL					
KILCORNEY	C	OWENBAUN	WELL	KILCORNEY	60.00

. SUM CUM
128 records summed
CUM
47108.41

Abstractions and Discharges

Introduction

Two of the more important uses of a river resource are :

i) Abstractions for various uses including

Domestic,
Industrial,
Agricultural.

ii) Controlled disposal of wastes, ie. Discharges

The use of a river for the disposal of waste is important but this use runs counter to the use of a river as a potable water source.

A river management plan must include plans to conserve water supplies at the standards appropriate to the various reaches of the river.

Abstractions

In 1978 a national survey of Abstractions and discharges was carried out by local authorities on behalf of the DOE and co-ordinated by AFF.

This information which was revised where necessary has been used in compiling Tables 3.1 ~~and 3.2~~.

Table 3.3 shows and compares the Public and Industrial abstractions by volume and by number. Fig.3.1 compares these graphically.

TABLE 3.3 VOLUME OF PUBLIC AND INDUSTRIAL ABSTRACTIONS.

ABSTRACTION TYPE	VOLUME	%/Vol.	NO.	%/No.
Public	47,108	69 40	128	74.0
Industrial (excl.CSET)	21,638	31 18	44	25.4
C.S.E.T.	50,000	42	1	0.6
Total =	118,746		173	
Public (River source)	14,464	31	11	9
Public (Non river source)	32,644	69	117	91
Industrial (River source) (excl.C.S.E.T)	7,983	37 11	3	7
Industrial (Non river source)	13,655	63 19	41	91
C.S.E.T. (River source)	50,000	70	1	2
	71,638		45	

FIGURE 3.1 Comparison of Abstractions by Volume and by Number.
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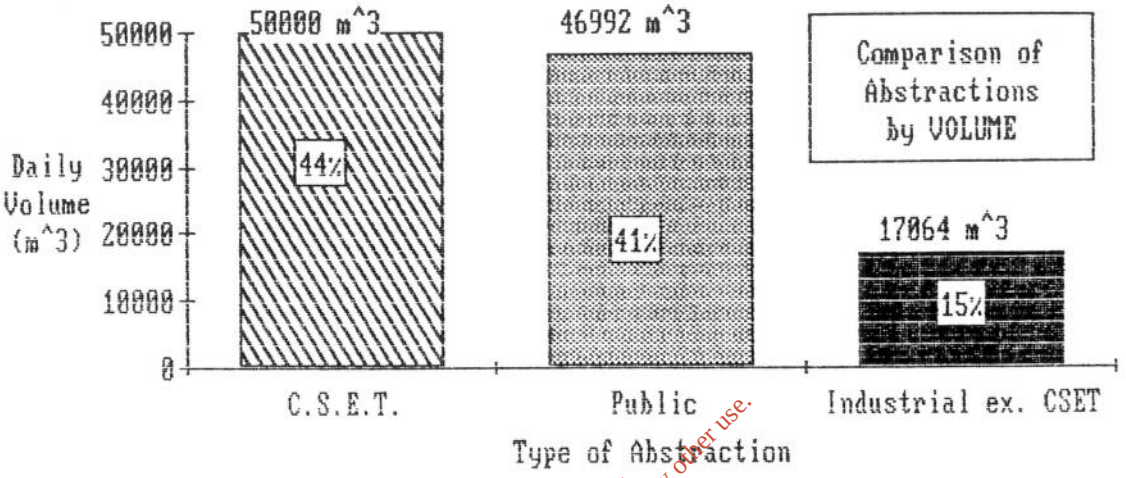


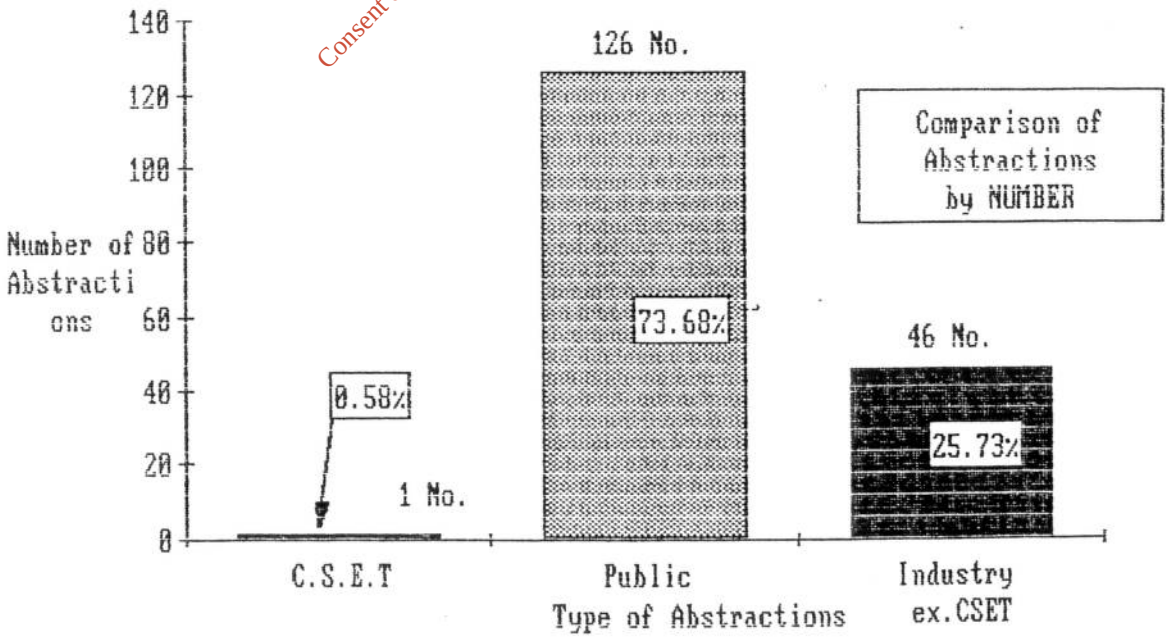


Table 3.~~3~~ 2 and Fig 3.1 show the following:

The total volume of water abstracted per day is 118,746 m^3

The abstraction of 5Ø,ØØØ m^3/day by C.S.E.T. is by far the largest in the catchment.

If one excludes the C.S.E.T. abstraction, the above table shows the following:

Public abstractions are 2.18 times the Industrial abstractions.

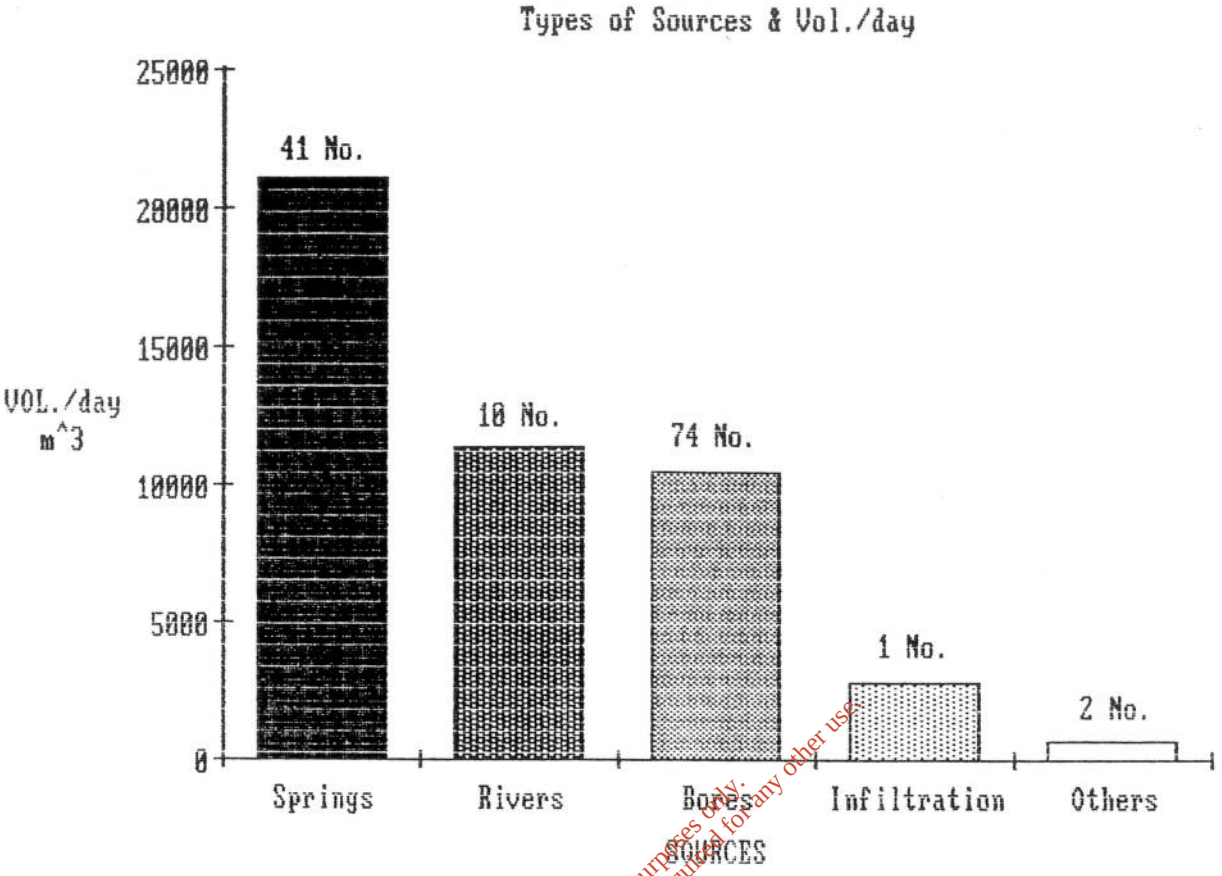
The ratio of non river to river sources is 2.2 to 1 in the case of public abstractions whereas the ratio is 1.71 to 1 in the case of industrial abstractions.

Table 3.~~4~~ 3 lists and compares the Types and Volumes of Public sources. Fig. 3.2 ~~and Fig. 3.3~~ compares these graphically.

TABLE 3.~~4~~ 3 Types of sources (PUBLIC) and vol/day for same
****

SOURCE	VOL. m^3	%/Vol.	NO.	%/No.
Springs	21114	45	41	32
Rivers	11459	24	1Ø	8
Bores	1Ø6Ø8	23	74	58
Infiltration gallery.	3ØØ5	6	1	
Others	832	2	2	2
Total	47ıØ8		128	

FIGURE 3.2 Comparison of Public Abstractions by NUMBER and TYPE
****



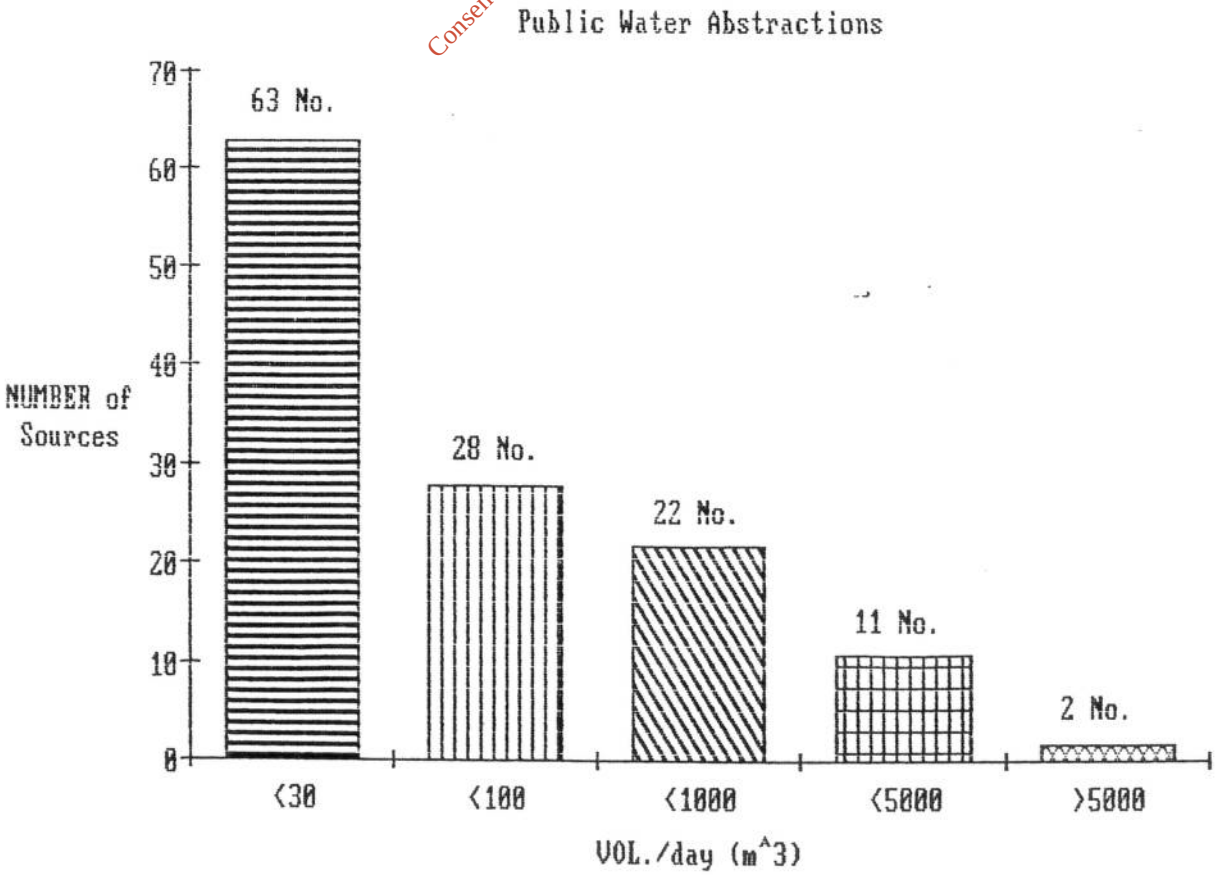


Table 3.3 and Figs. 3.2 show the following:

Rivers account for 24% (11459m^3) of the daily volume of public abstractions and groundwater sources account for the other 76%.

Groundwater sources are far more numerous than river sources accounting for 118 (92%) out of the 128 sources.

Table 3.4 below lists the River sources used for Public Abstraction:

SCHEME	CO	SOURCE	LOCATION	M^3/day
Allow Regional	C	Allow	Freemount	2496
Mallow Urban	C	Clydagh	Clydagh Bridge	2273
Youghal	W	Glendine	Glendine River	1920
Mitchelstown	C	Funshion	Galtee Mountains	1820
Lismore-Cappoquin -Ballyduff	W	Owenashad	Rough Glen,Glenakeeffe	820
Conna Regional	C	Bride	Bride Bridge	780
Tallow	W	Tallow	Kilbeg	200
Banteer-Knockbrack	C	Bride	Knockbrack	360
Kildorrery	C	Stream	Ballyvisteen	70

Potential sources of pollution to River abstractions are:

Direct contamination of the river upstream of the abstraction point

Surface water runoff from a contaminated area adjacent to the river upstream of the abstraction point.

The sources of contamination include chemical spillages on roads and agricultural sources.

It has been necessary to stop the abstraction of water for the Allow Regional water supply scheme on a number of occasions due to pollution of the river by slurry and other agricultural pollutants.

The use of Section 12 of the 1977 Water Pollution Act by Cork Co. Council has helped to reduce the incidence of pollution of the River Allow upstream of Freemount.

Pollution of Groundwater sources.

Careless and negligent storage and disposal of agricultural wastes pose the major threat to groundwater sources. This is especially so in the case of the Dinantian limestone areas (fissured aquifer) referred to in Section 2.

Cork Co.Council and Waterford Co.Council have organised geological surveys of the more critical areas in the Blackwater catchment. These surveys have highlighted areas of major risk and have made various reccomendations and suggested precautions to minimise the danger to the groundwater sources from Agricultural Pollution.
(c.f. various GEOEX surveys)

Table 3.5 below lists the number of abstractions within the daily volume ranges as shown.

TABLE 3.5 PUBLIC WATER ABSTRACTIONS (Vol.by number)

m^3	NO.	m^3			m^3
Ø <	22	< 1Ø		Volume =	14Ø.56
1Ø <	28	< 2Ø		Volume =	443.58
2Ø <	14	< 3Ø		Volume =	338.66
	--				------
Total	64		(5Ø%)		922.8Ø
3Ø <	7	< 4Ø		Volume =	216.85
4Ø <	5	< 5Ø		Volume =	214.75
5Ø <	6	< 6Ø		Volume =	334.72
6Ø <	5	< 7Ø		Volume =	329.55
7Ø <	Ø	< 8Ø		Volume =	ØØØ.ØØ
8Ø <	3	< 9Ø		Volume =	262.ØØ
	--				-------
Total	26		(2Ø%)		1357.87
9Ø <	3	< 1ØØ	(2%)	Volume =	272.74
1ØØ <	22	< 1ØØØ	(17%)	Volume =	9481.ØØ
1ØØØ <	11	< 33ØØ	(9%)	Volume =	23215.ØØ
5ØØØ <	2		(2%)	Volume =	11819.ØØ

Table 3.5 shows that the majority (64 No. = 5Ø%) of public abstractions are less than 3Øm^day.

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INDUSTRIAL ABSTRACTIONS

****

TABLE 3.2

INDUSTRIAL ABSTRACTIONS
RIVER BLACKWATER CATCHMENT

Industry Name	Industry Type	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
** Industry type: BAKE						
OWEN BINCHY, KANTURK.	BAKE	C	ALLOW	BORE	GROUNDS	3.00
** Industry type: BEET						
C.S.E.T. MALLOW	BEET	C	BLACKWATER	RIVER	GROUNDS	50000.00
** Industry type: CHEM						
FRANK O'CONNOR,FERMOY.	CHEM	C	BLACKWATER	BORE	GROUNDS	14.00
MICRO BIO,FERMOY.	CHEM	C	BLACKWATER	BORE	GROUNDS	10.00
** Industry type: CHOC						
FRY CADBURY,RATHMORE.	CHOC	K	BLACKWATER	RIVER	GROUNDS	4636.30 ~~0.00~~
** Industry type: CONC						
JOHN.A.WOODS,BALLYGIBLIN	CONC	C	AWBEG MINOR	BORE	GROUNDS	45.00
NOEL C.DUGGAN,	CONC	C	ALLOW	BORE	GROUNDS	17.00
** Industry type: CREM						
MITCHELSTOWN CO-OP	CREM	C	FUNSHION	BORE	GROUNDS	7274.00
BALLYCLOUGH CO-OP (1)	CREM	C	BLACKWATER	RIVER	GROUNDS	2727.00
BALLYCLOUGH CO-OP (2)	CREM	C	BLACKWATER	BORE	GROUNDS	2273.00
CASTLELYONS CREAMERY.	CREM	C	BRIDE	BORE	GROUNDS	1820.00
KANTURK CREAMERY (N.CORK)	CREM	C	ALLOW	BORE	GROUNDS	456.00
NEWMARKET CREAMERY	CREM	C	ALLOW (DALUA)	BORE	GROUNDS	227.30
LISMIRE CREAMERY (NM)	CREM	C	ALLOW	BORE	GROUNDS	69.00
ROWELS CREAMERY (NM)	CREM	C	ALLOW	BORE	GROUNDS	69.00
KISKEAM CREAMERY (NM)	CREM	C	OWENTARAGLIN	BORE	GROUNDS	60.00
LAKEVALE CREAMERY (NM)	CREM	C	BLACKWATER	BORE	GROUNDS	55.00
FREEMOUNT CREAMERY (GV)	CREM	C	ALLOW	BORE	FREEMOUNT	41.00
ARAGLIN CREAMERY (M)	CREM	C	ARAGLIN	BORE	GROUNDS	30.00
CUMMER CREAMERY (NM)	CREM	C	ALLOW	BORE	GROUNDS	5.45
GLASLAKINLEEN (NM)	CREM	C	ALLOW	BORE	GROUNDS	5.00
DROMTARIFFE (BC)	CREM	C	BLACKWATER	BORE	GROUNDS	3.00
KILCORNEY CREAMERY (BC)	CREM	C	OWENBAUN	BORE	GROUNDS	1.00
RATHMORE CREAMERY (K)	CREM	K	BLACKWATER	BORE	GROUNDS	10.00
** Industry type: DRNK						
J.O'CONNOR, KANTURK.	DRNK	C	ALLOW	BORE	GROUNDS	10.00
** Industry type: MART						
MALLOW MART,	MART	C	BLACKWATER	BORE	GROUNDS	90.00
FERMOY MART,	MART	C	BLACKWATER	BORE	GROUNDS	90.00
MITCHELSTOWN MART,	MART	C	FUNSHION	BORE	GROUNDS	20.00
KANTURK MART	MART	C	ALLOW	BORE	GROUNDS	15.00
MILLSTREET MART	MART	C	FINNOW	BORE	GROUNDS	10.00

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TABLE 3.2
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INDUSTRIAL ABSTRACTIONS
RIVER BLACKWATER CATCHMENT
==========

Industry Name	Industry Type	County	River Catchment	Source Type	Location of source	Daily Vol.m^3
** Industry type: MEAT						
HORGAN MEATS	MEAT	C	AWBEG	BORE	GROUNDS	252.00
AGRA MEATS,WATERGRASSHILL	MEAT	C	BRIDE	BORE	GROUNDS	~~227.00~~ 231.0
GALTEE BACON	MEAT	C	FUNSHION	BORE	GROUNDS	227.00

Cum
33 records summed
Cum
66145.75

LIST OF ABBREVIATIONS
set print-off----------

BAKE	=	Bakery
BEET	=	Beet Processing
CHEM	=	Chemical processing and usage.
CREM	=	Creamery and milk processing plants.
DRNK	=	Soft drink manufacturer.
MART	=	Cattle and sheep mart.
MEAT	=	Meat processing plant.

(IND:WS)

INDUSTRIAL ABSTRACTIONS

The volume of water abstracted each day in the Blackwater catchment by Industry (including CSET @ 50,000m^3/day) is approx. 71,638 m^3. This is 50% more than the volume abstracted for public use.

Table 3.~~5~~6 has shown that excluding the C.S.E.T. abstraction, industrial abstractions are only 46% of the public abstractions.

Table 3.~~6~~7 and Fig. 3.5 below show the type ,number and volume of the various industrial abstractions.

TABLE 3.~~6~~7 TYPE, NUMBER, AND VOLUME OF INDUSTRIAL ABSTRACTIONS

Industry	No.	Daily Volume m^3	% incl. CSET	% excl. CSET
Bakery	1	3		Ø.Ø1
Beet Factory	1	5Ø,ØØØ	7Ø	Ø
Chemical	2	14	Ø.Ø2	Ø.Ø6
Chocolate Products	1	4,636	6	21
Creamery	17	15,116	21	7Ø
Drink	1	1Ø	Ø.Ø1	-
~~Farming~~	~~12~~	~~924~~	~~1~~	~~4~~
Marts	5	225	Ø.3	1
Meat Processing	3	71Ø	1	3
		71,638		

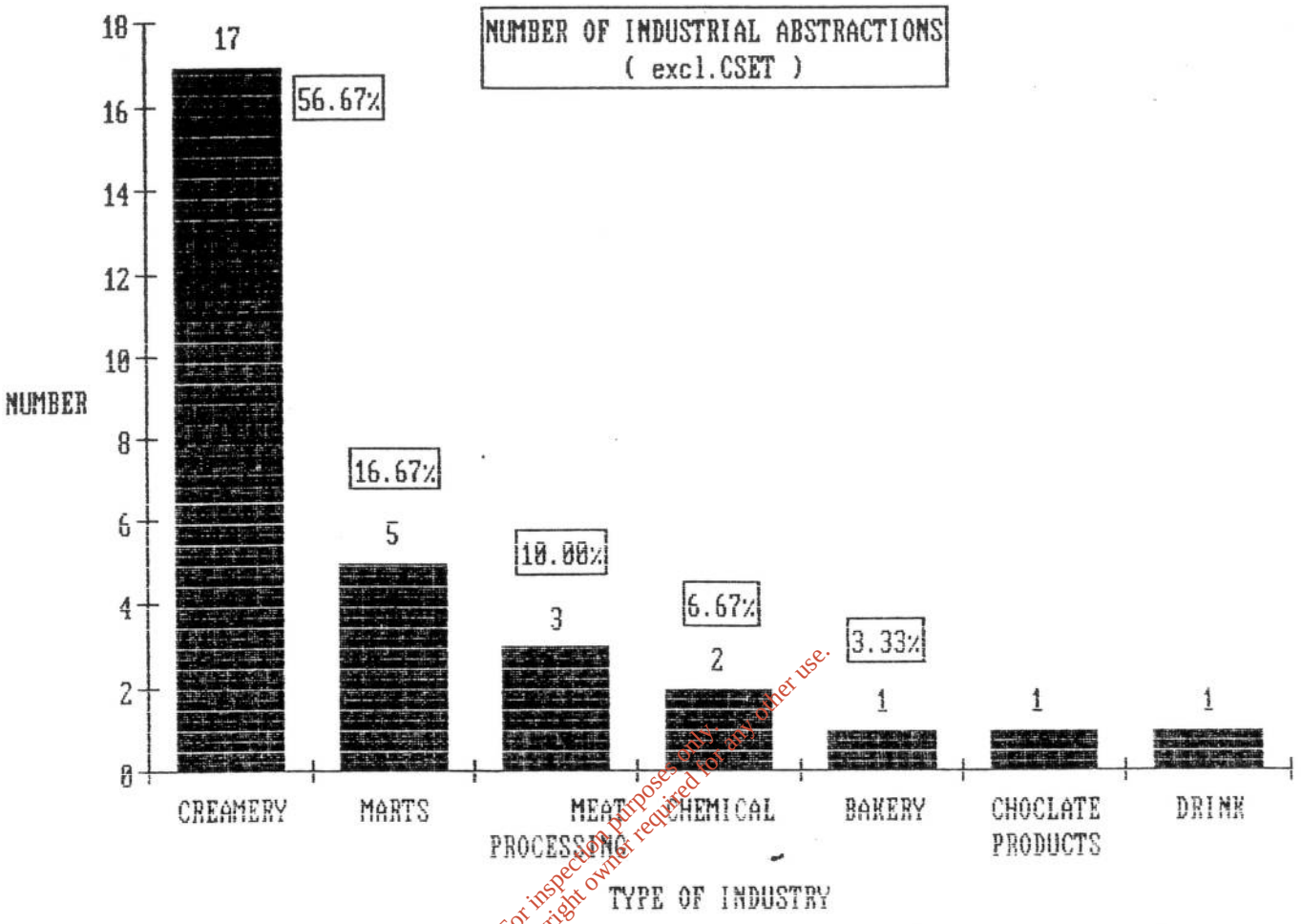
Table 3.~~6~~7 above shows the following:

The C.S.E.T. factory at Mallow with an abstraction of 5Ø,ØØØ m3/day accounts for 7Ø% of the Industrial Abstractions.

Creameries are next on the list with 21% by volume of industrial abstractions.

FIGURE 3 3
****

INDUSTRIAL ABSTRACTIONS BY TYPE NUMBER AND VOLUME



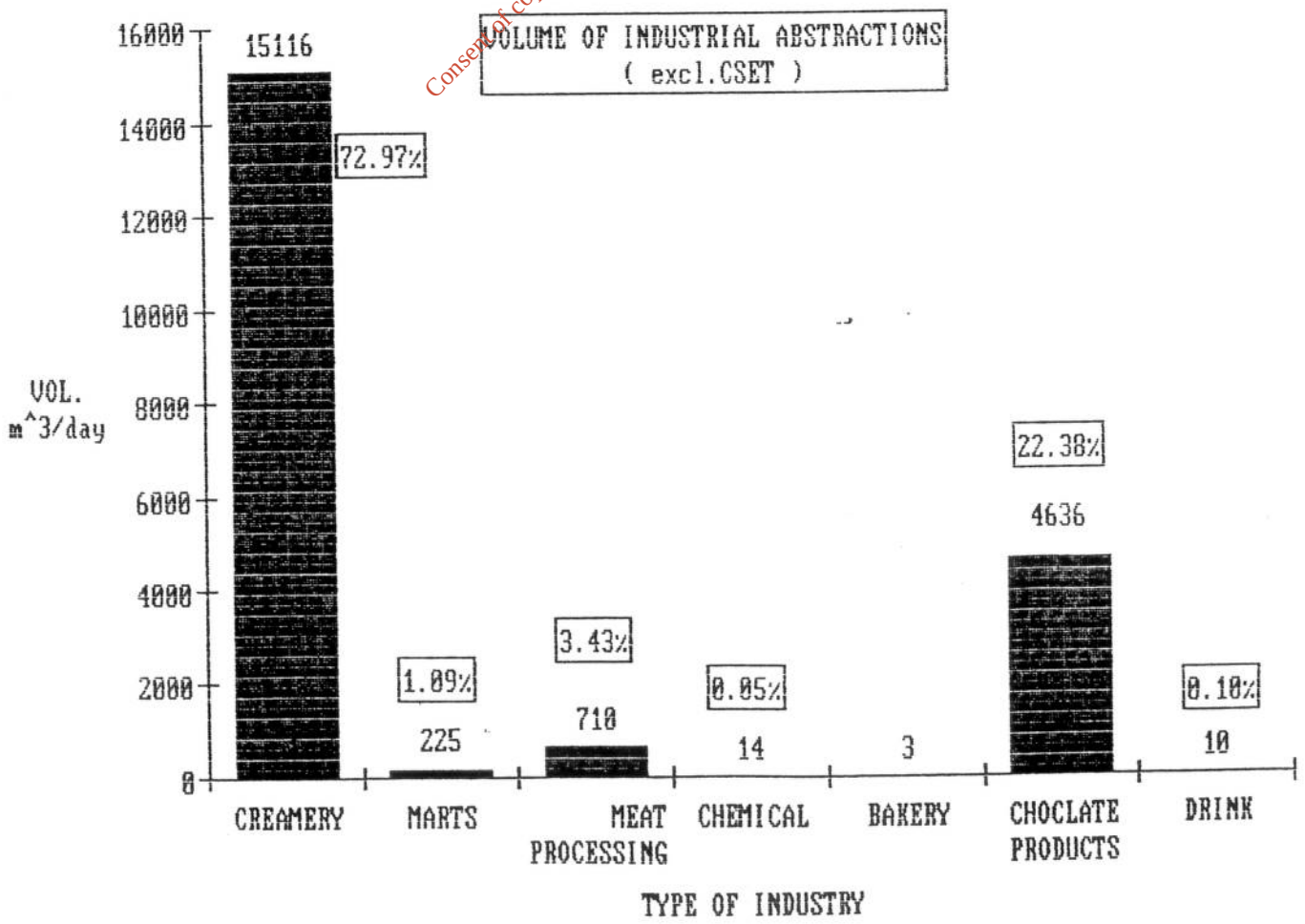


FIGURE 3.~~6~~ 3.4 INDUSTRIAL ABSTRACTIONS -TYPES AND VOLUMES
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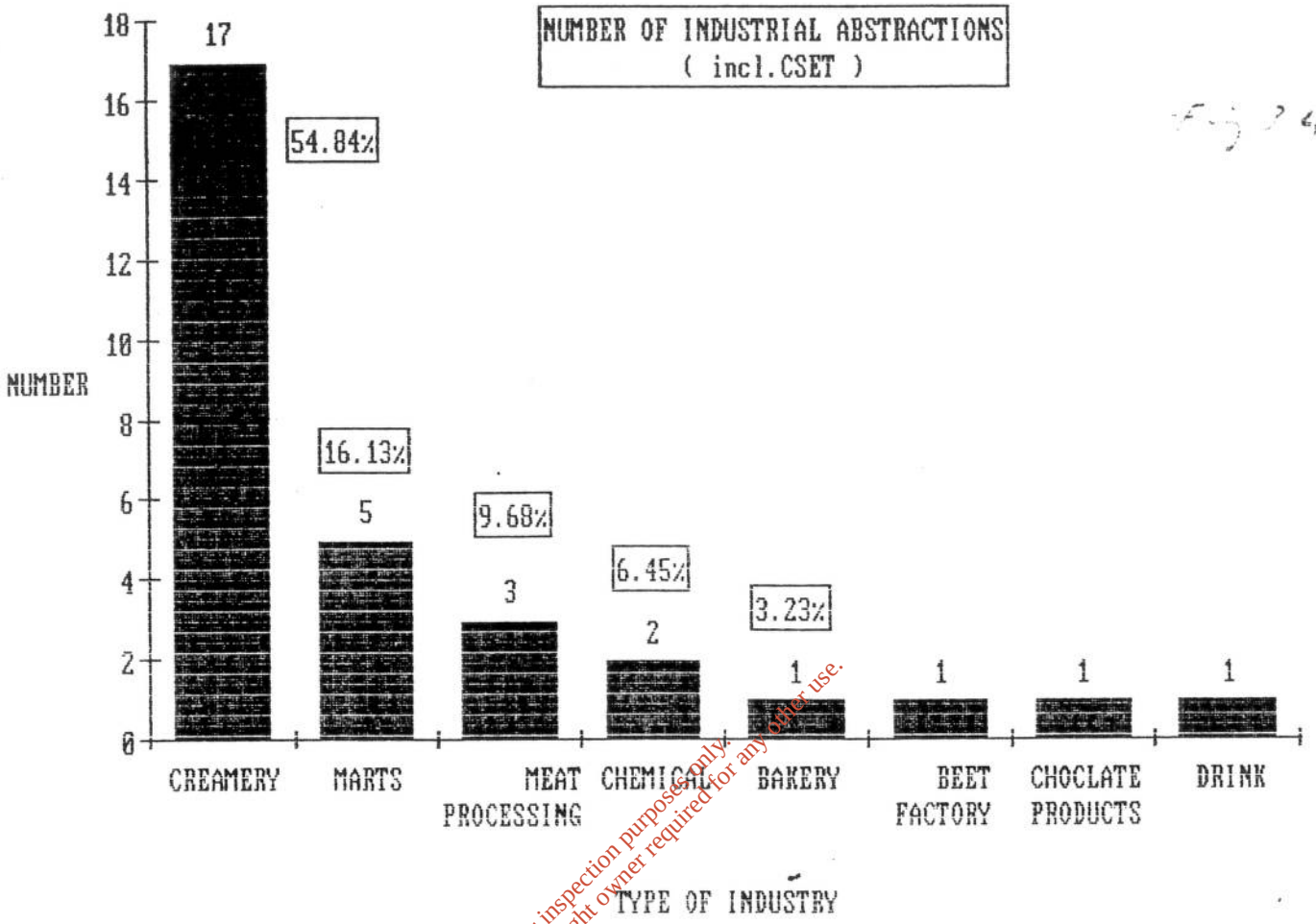


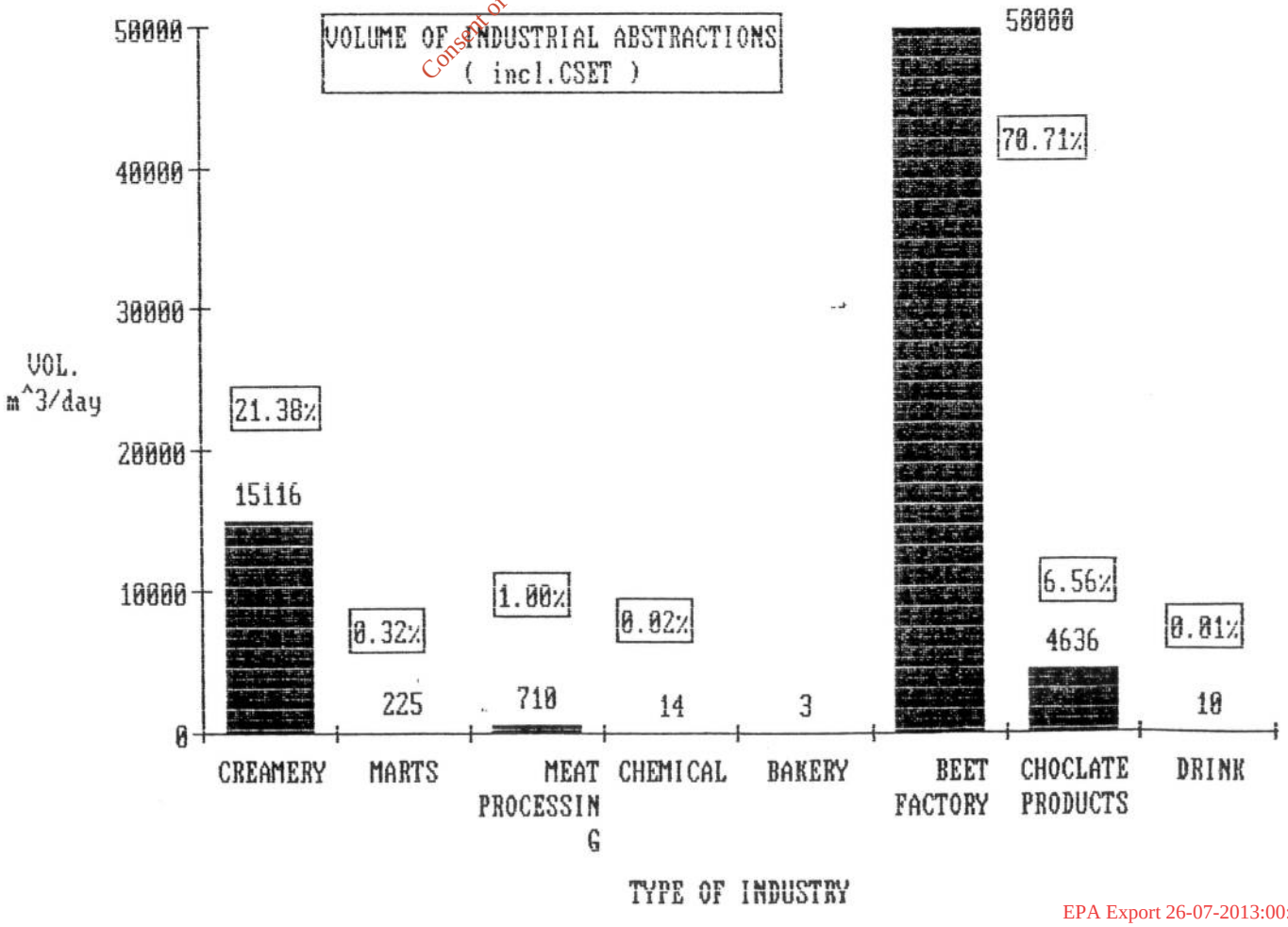


Table 3.8 and Fig. 3.3 compare the type, number and volume of industrial abstraction sources (including CSET).

TABLE 3.8 Type and Volumes for the various sources of Industrial Abstractions.(incl.CSET)

Source.	No.	Vol/day (m^3)	%
Rivers	4	57,982	81
Bores	39	13,636	19
Springs	2	20	<1
		71,638	

Due to the large volume of water used by C.S.E.T. the bulk of water used by industry is abstracted from river sources.

Table 3.9 compares the type, number and volume of Industrial Abstractions (excluding CSET).

Source	No.	Vol/day (m^3)	%
Rivers	3	7,982	37
Bores	39	13,636	63
Springs	2	20	<1
		21,638	

There are 3 industries abstracting their water from the main channel of the Blackwater. Table 3.10 lists these.

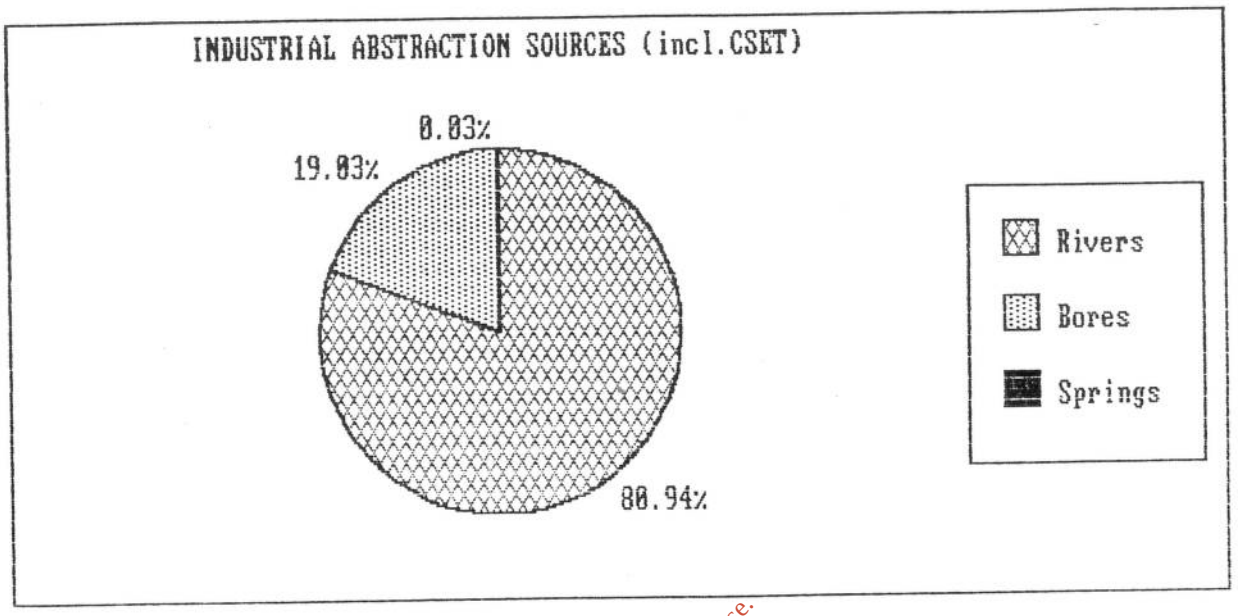
TABLE 3.10 Industries abstracting water from main channel of River Blackwater.

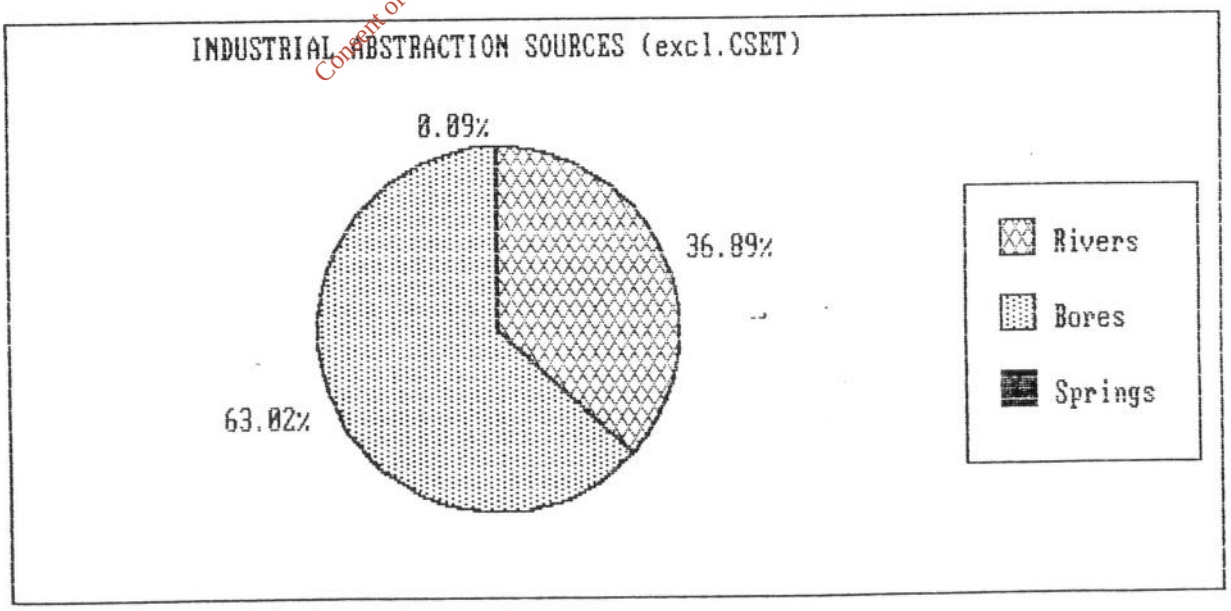
INDUSTRY	LOCATION	Daily VOL.
Fry Cadbury	Rathmore	4,636 m^3
C.S.E.T.	Mallow	50,000 m^3
Ballyclough Co-Op	Mallow	2,727 m^3
		57,363 m^3 total

The volume of 57,363 represents 80% of the volume of the daily industrial abstraction.

FIGURE 3.5

Fig 3.5





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DISCHARGES

****

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PUBLIC

DISCHARGES

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TABLE 3.11

PUBLIC DISCHARGES
BLACKWATER CATCHMENT

Scheme Name	County	River Catchment	Discharge Point	Design Population	Population Served	Daily Vol.	BOD Load
** Type of Treatment E.A.							
CECILSTOWN	C	AWBEG MINOR	STREAM	180	94	23	2.23
BALLYHEA	C	AWBEG	RIVER AWBEG	125	60	14	1.40
CHURCHTOWN	C	AWBEG	STREAM	120	107	27	0.22
** Type of Treatment NONE							
FERMOY	C	BLACKWATER	RIVER BLACKWATER	0	5100	1200	333.00
** Type of Treatment O.D.							
MILLSTREET	C	FINNOW	TRIB.TO FINNOW	1600	1435	364	0.00
MALLOW URBAN	C	BLACKWATER	RIVER BLACKWATER	15000	7482	1701/750	0.00
FERMOY S.S.(READY 1987)	C	BLACKWATER	RIVER B.WATER 1 KM D/S FERMOY	9000	7000	2040	491.00
** Type of Treatment P.F.							
MITCHELSTOWN	C	FUNSHION	RIVER FUNSHION	11000	3106	800	0.00
NEWMARKET	C	ALLOW (DALUA)	RIVER DALUA	700	1025	233	0.00
WATERGRASSHILL	C	BRIDE	STREAM	200	202	38	0.46
DONERAILE	C	AWBEG	RIVER AWBEG	920	920	209	14.00
BOHERBUE	C	ALLOW	RIVER BROGEEN	409	409	93	3.40
BUTTEVANT	C	AWBEG	RIVER AWBEG	1200	1161	264	7.92
LISMORE	W	BLACKWATER	RIVER BLACKWATER	0	0	2568	0.00
RATHMORE	K	BLACKWATER	RIVER BLACKWATER	0	0	23	0.00
** Type of Treatment PRIMARY							
KANTURK	C	ALLOW	RIVER ALLOW	2200	4475	441	0.00
** Type of Treatment S.T.							
KILWORTH	C	ARAGLIN	RIVER DOUGLAS	400	402	91	0.00
KNOCKNAGREE	C	BLACKWATER	RIVER BLACKWATER	120	285	74	0.00
RATHCORMAC	C	BRIDE	RIVER BRIDE	100	247	60	0.00
LISCARROL	C	AWBEG	STREAM	150	276	63	0.00
KILDORRERY	C	FUNSHION	RIVER FUNSHION	300	252	65	0.00
CLONDULANE	C	BLACKWATER	TRIB.TO BLACKWATER	680	686	46	7.17
DROMAHANE	C	CLYDAGH	STREAM	680	686	156	0.00
BANTEER	C	BLACKWATER	STREAM	120	217	49	4.90
BALLYCLOUGH	C	BLACKWATER	STREAM	265	265	60	6.00
CASTLELYONS	C	BRIDE	STREAM (SHANOWEN)	150	171	39	3.90
BRIDESBRIDGE	C	BRIDE	RIVER BRIDE	150	170	39	3.90
BALLYDESMOND	C	BLACKWATER	RIVER BLACKWATER	140	238	54	0.00
KILLAVULLEN	C	BLACKWATER	RIVER ROSS	300	199	45	4.50
CONNA	C	BRIDE	RIVER BRIDE	100	93	21	2.10
CASTLEMAGNER	C	AWBEG MINOR	RIVER AWBEG MINOR	100	50	11	1.10
CULLEN	C	OWENTARAGLIN	RIVER OWENTARAGLIN	120	124	28	0.84
RATHCOOLE	C	OWENBAUN	RIVER OWENBAUN	150	150	34	3.40
LOMBARDSTOWN	C	BLACKWATER	RIVER DUBGLAISE	50	40	9	0.90
FREEMOUNT	C	ALLOW	RIVER ALLOW	118	122	28	1.10
CASTLETOWNROCHE	C	AWBEG	RIVER AWBEG	470	455	103	10.30
SHANBALLYMORE	C	AWBEG	SOAKPIT	120	108	25	0.00

TABLE ~~3.9~~ 3.11

PUBLIC DISCHARGES
BLACKWATER CATCHMENT

Scheme Name	County	River Catchment	Discharge Point	Design Population	Population Served	Daily Vol.	BOD Load
BALLYHOOLEY	C	BLACKWATER	RIVER BLACKWATER	100	104	24	4.70
GLANWORTH	C	FUNSHION	RIVER FUNSHION	350	335	76	6.10
DUNTAHANE	C	BLACKWATER	RIVER BLACKWATER	400	400	91	9.10
KISKEAM	C	OWENTARAGLIN	RIVER OWENTARAGLIN	150	132	30	3.00
BALLYNOE	C	BRIDE	STREAM	120	107	24	2.40
BALLINDANGAN	C	FUNSHION	STREAM	20	20	5	0.50
NADD	C	GLEN	STREAM	20	20	5	0.50
LYRE	C	GLEN	SOAKPIT	20	20	5	0.50
CAPPOQUIN	W	BLACKWATER	RIVER BLACKWATER	0	0	~~225~~	0.00
BALLYDUFF	W	BLACKWATER	RIVER BLACKWATER	0	0	~~22~~	0.00
SUNLAWN	W	FINISK	TRIB.TO FINISK	0	0	21	2.10
AGLISH	W	GOISH	RIVER GOISH (COOLROE)	0	0	38	3.80
TALLOW	W	BRIDE	RIVER BRIDE	0	0	~~250~~	19.00
VILLIERSTOWN	W	BLACKWATER	RIVER BLACKWATER (THE QUAY)	0	0	50	5.00
CLASHMORE	W	BLACKWATER	STREAM (GREGAGH ?)	0	0	100	0.00
BALLYDASOON	W	??	SOAKWAY	0	0	8	0.80
PILLTOWN	W	BLACKWATER	SOAKWAY	0	0	20	0.00
TOORANEENA	W	FINISK	SOAKWAY	0	0	6	0.60
CAPPOQUIN (DANES FIELD)	W	GLENAFALLIA	RIVER GLENSHELANE (SHANBALLY)	0	0	76	7.60
MILFORD	C	DEEL	DEEL	450	450	102	31.50
MEELIN (2 No.)	C	ALLOW	SOAKPIT	0	120	30	3.00
DERINAGREE	C	BLACKWATER	SOAKPIT	0	20	5	0.50
TULLYLEASE	C	ALLOW	STREAM	0	40	10	1.00

. count
60 records

.

19

Discharges in the Blackwater Catchment

The principal discharges occurring in the Blackwater Catchment are generated from three sources:

Agricultural
Domestic
Industrial

The locating of the Agricultural discharges in the Blackwater catchment is mainly dependant on the general public reporting the existance of same to either Fisheries or the Local Authorities.

Unfortunately in a lot of cases the members of the public are unaware of whom to inform if and when they happen to observe the occurance of Agricultural discharges.

PUBLIC DISCHARGES

The 1978 national survey of discharges, revised where necessary, has been used in compiling Tables 3.9

Table 3.9 lists the Public discharges in the Blackwater Catchment.

Table 3.12 below lists the principal methods used by local authorities of treating domestic sewage and compares them by type, number and population served.

TABLE 3.12 Types of Sewage treatment use by local authorities

Treatment	No.	%	Population Served	
Extended Aeration	3	5	261	1%
Oxidation Ditch	3	5	8,917	27%
Percolating filter	7	12	6,822	21%
Primary (Imhoff)	1	2	4,475	14%
Septic Tank	43	73	7,ØØ4	21%
None	1	2	5,1ØØ	16%
	53		32,579	
* Private Septic tanks	9,246		36,984	
* No treatment	1,28Ø		5,118	

* = figures for Co.Cork only.

Information on the number of persons served by the various sewerge schemes was supplied by the Sanitary Department of the authorities involved.

Quality of Effluent.

With both the domestic and industrial discharges the quality of the effluent varies enormously .

A number of factors may cause a bad quality effluent. These include the following:

Overloading of the treatment works

Mechanical fault at treatment works

Lack of proper maintenance of the treatment works

The figures used for estimating domestic waste loads where no observed readings were available are shown below in Table 3.13.

TABLE 3.13 Factors For Estimating Domestic Loads.

Habitation factor = 4 persons 1 house

Water usage 227 Litres /day/head.

Waste load = Ø.Ø54 kg BOD/day/head.

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INDUSTRIAL

DISCHARGES

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TABLE 3.13

INDUSTRIAL DISCHARGES
BLACKWATER CATCHMENT

Industry	County	River Catchment	Discharge Point	BOD	Daily Volume	BOD Load
** TYPE BEET						
C.S.E.T.	C	BLACKWATER	RIVER BLACKWATER	780.0	50000	39000.00
** TYPE CHEM						
BRAEMAR FRAMEMAKERS	W	BRIDE	GLENABOY RIVER	0.0	13	0.00
** TYPE CHOC						
FRY-CADBURY	K	BLACKWATER	RIVER BLACKWATER	20.0	15000	150.00
** TYPE CREM						
ARAGLIN BRANCH (M)	C	ARAGLIN	STREAM TRIB.TO ARAGLIN	0.0	30	0.25
BALLYCLOUGH CO-OP	C	BLACKWATER	RIVER BLACKWATER	0.0	3182	89.00
BALLYDUFF BRANCH	W	BLACKWATER	RIVER BLACKWATER	0.0	20	0.00
CASTLELYONS CO-OP	C	BRIDE	RIVER BRIDE	12.0	1820	1.50
CUMMER BRANCH (NM)	C	ALLOW	TRIB.OF ALLOW (CUMMERDUFF)	0.0	5	0.25
DROMTARIFFE BRANCH (BC)	C	BLACKWATER	STREAM TRIB.TO	0.0	3	0.25
FREEMOUNT BRANCH (GV)	C	ALLOW	STREAM TRIB.TO ALLOW	0.0	5	0.25
GLASHAKINLEEN (NM)	C	ALLOW	RIVER OWENAKEAL	0.0	5	0.25
KANTURK CREAMERY	C	ALLOW	RIVER ALLOW	21.0	455	9.60
KILCORNEY BRANCH (BC)	C	OWENBAUN	RIVER OWENBAUN	0.0	1	0.25
KISKEAM BRANCH (NM)	C	OWENTARAGLIN	RIVER OWENTARAGLIN	0.0	5	0.25
LAKEVALE BRANCH (NM)	C	BLACKWATER	STREAM,TRIB.TO BLACKWATER	0.0	5	0.25
LISMIRE BRANCH (NM)	C	ALLOW	STREAM	0.0	69	0.25
MITCHELSTOWN CREAMERY	C	FUNSHION	RIVER FUNSHION	29.0	5455	158.00
NEWMARKET CREAMERY	C	ALLOW (DALUA)	STREAM TRIB.TO DALUA	0.0	227	4.80
RATHMORE BRANCH (K)	K	BLACKWATER	STREAM (CULLAVAW) TRIB.TO BW	0.0	103	2.00
ROWELS BRANCH (NM)	C	ALLOW	RIVER ALLOW	0.0	5	0.25
SILVER PAIL	C	BLACKWATER	RIVER BLACKWATER	0.0	0	0.00
SPRINGMOUNT DAIRY (BC)	C	BLACKWATER	RIVER BLACKWATER	0.0	23	0.00
** TYPE FARM						
AN FORAS TALUNTAIS	C	FUNSHION	SOAKAGE AREA	0.0	682	0.25
** TYPE HENS						
J.O'CONNOR & SONS,POULTRY	W	BLACKWATER	RIVER BLACKWATER	0.0	73	0.00
** TYPE HOSP						
MOUNT ALVERNIA	C	BLACKWATER	RIVER BLACKWATER	0.0	5	0.25
** TYPE MART						
FERMOY MART	C	BLACKWATER	RIVER BLACKWATER	300.0	500	145.00
MALLOW MART	C	BLACKWATER	RIVER BLACKWATER	0.0	136	0.00
MILLSTREET MART	C	FINNOW	STREAM TRIB.TO FINNOW	0.0	0	0.00
MITCHELSTOWN MART	C	FUNSHION	RIVER FUNSHION	0.0	20	0.00
** TYPE MEAT						
AGRA MEAT PACKERS	C	BRIDE	STREAM (VIA LAND SPRAY)	0.0	0	0.00
GALTEE TENDER FOODS	C	FUNSHION	RIVER FUNSHION	0.0	228	0.00

TABLE 3.~~14~~ 15

INDUSTRIAL DISCHARGES
BLACKWATER CATCHMENT

Industry	County	River Catchment	Discharge Point	BOD	Daily Volume	BOD Load
HORGAN MEATS (ARDNAGEEHY)	C	AWBEG	STREAM (VIA LAND SPRAY)	0.0	252	0.00
** TYPE VEG. SUN PRODUCTS, NEWMARKET.	C	ALLOW (DALUA)	TRIB.TO DALUA	0.0	2	0.00

INDUSTRIAL DISCHARGES

The 1978 national survey of discharges with revisions where necessary has been used in compiling Table 3.13 over.

Monitoring of Industrial Discharges.

Effluent from the major creameries, C.S.E.T. and other industries such as meat processing plants are monitored regularly by local authorities and the daily waste loads were estimated from the results of these surveys.

Intermittent Discharge of Effluent by C.S.E.T.

C.S.E.T.'s system of discharging their effluent differs from other systems in that C.S.E.T. only discharge when the flow in the River Blackwater is equal to or greater than 55 m^3/sec. giving a dilution of more than 1 / 1ØØ .

C.S.E.T. are not in operation in the summer months when critical low flows are most likely to occur.

Not withstanding this the daily waste load of 7,8ØØ kg BOD from C.S.E.T. when they are in full production is 24 times the daily waste load for the rest of the catchment.

Industries which are potential sources of pollution are dealt with in the next section.

Potential Sources of Pollution

Potential Sources of Pollution in the Blackwater Catchment

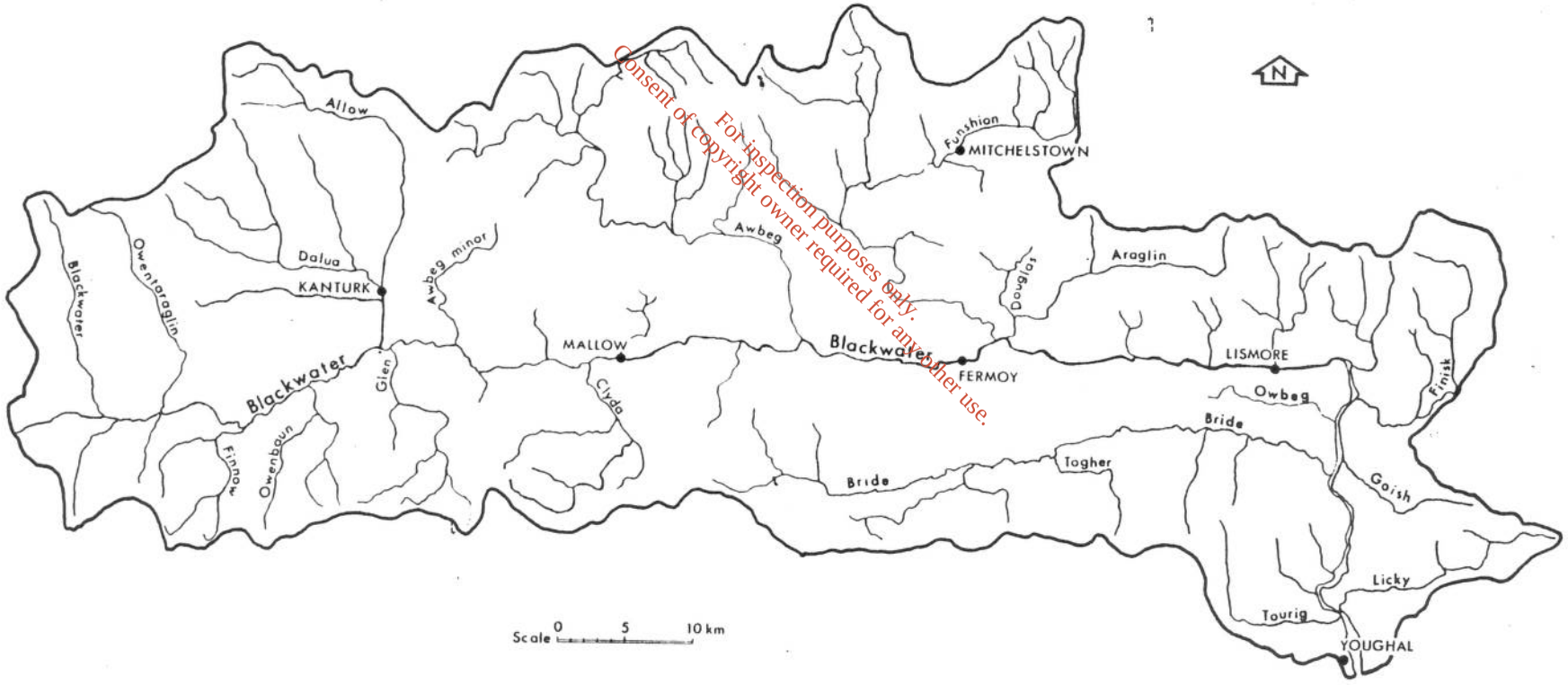
From an analysis of river sampling results and list of industries indicate the following locations as potential sources of pollution.

River	Location	Potential Sources of Pollution
Blackwater	Rathmore	Rathmore Creamery Rathmore S.T.W. Fry Cadbury
Blackwater	Mallow	CSET Ballyclough Co-Op Mallow S.T.W.
Allow	Kanturk	North Cork Creamery Kanturk STW North Cork Creamery T.W.
Gradoge	Mitchelstown	Mitchelstown Co-Op T.W. Agricultural Sources u/s Mitchelstown
Funshion	Mitchelstown	Mitchelstown Co-Op T.W. Mitchelstown S.T.W. Agricultural Sources

The mass balance formula is useful for determining the effect on receiving waters effluent discharges.

$$T = \frac{FC + fc}{F + f} = \text{B.O.D. level of receiving waters d/s of discharge}$$

C = B.O.D. level of water u/s of discharge
C = B.O.D. level of effluent
F = River Flow u/s of discharge
f = Flow of discharge.



LOCATION OF POTENTIAL SOURCES OF POLLUTION
IN BLACKWATER CATCHMENT.

INDIVIDUAL EFFLUENT LOADS

Description of Individual Effluent Loads in the Blackwater Catchment.

RATHMORE DISCHARGES

Source	Vol. Discharged m3/day	BOD load kg/day
Rathmore Creamery	95	2
Rathmore S.T.W.	91	7.5
Fry Cadbury	~~5700~~ 15000	124

Rathmore Creamery (Kerry Co-Op)

Approximately 96m^3 of effluent is discharged from the creamery to t
Cullavaw Stream at a point 650 metres u/s of it's confluence with th
River Blackwater.

91 m^3 of this effluent is cooling water and the balance arises fro
the washdown of premises and the plant.

It is estimated that the BOD loading to the stream is approx.
2 kg BOD/day.

No sampling results area available for the effluent or the stream i
the vicinity of the discharge point. However the stream was sample
just upstream of the confluence as part of a 24 hour survey in July
1985 and the average BOD (mg/1) was 3.02 with a peak value of 5.7.

Rathmore S.T.W.

The Rathmore Sewerage Treatment Works is a Percolating Filter type
is located immediately d/s of the confluence of the Cullavaw Strea
at a point where the River Blackwater forms the county boundary
between Cork and Kerry.

There are in the region of 100 houses connected into same. The
treatment works discharges to the River Blackwater giving an orga
loading of 7.5 kg BOD/day to the river.

Fry Cadbury

This company is engaged in the manufacture of chocolate. It's eff
is discharged to the River Blackwater at a point 400 m. d/s of
Duncannon Bridge.

As in the case of the Rathmore S.T.W.(above), the River Blackwate
forms the county boundary between Cork and Kerry at this point.

It's effluents include cooling water (5064 m^3), treated domestic sewage (250 persons), treated washwater and cooling water. All these effluents are discharged through one pipe to the River Blackwater giving a load of 124 kg BOD/day (PE.2300).

In a low flow situation, any exceeding of the above loading could seriously effect the BOD and DO level in the river in the discharge point down to the Awnaskirtaun confluence.

NEWMARKET DISCHARGES

Scheme	Vol. Discharged m3/day	Kg BOD Load
Newmarket S.T.W.	270	18.0
Newmarket Creamery	227	3.0

Newmarket S.T.W

Approximately 270 m^3/day of treated effluent is discharged to the nearby River Dalua. The effluent is treated using a percolating filter system: the organic loading of the discharge is estimated at 18.0 kg. BOD/day. The plant is in need of overhaul as its mechanical state is only fair.

Newmarket Creamery

Approximately 227 m^3/day of effluent is discharged from a treatment works to a stream which is a tributary of the River Dalua at a point 3 km u/s of their confluence. The creamery produces milk, cheese and other dairy products The organic loading of the discharge from the treatment plant to the stream is 3 kg. BOD/day. P.E. (60).

Kanturk Discharges

Scheme	Vol. Discharged m3/day	Kg. BOD
Kanturk S.T.W.	441	47
North Cork Creameries	455	10

Kanturk S.T.W.

Approximately 441 m^3/day of effluent is discharged to the River Allow via a treatment works at a point 1 km. d/s of Kanturk town.

The efficiency of the treatment works is poor and this is reflected in the BOD values of the treated effluent.

In a 24 hour survey carried out in July 1985, the BOD of the effluent varied from a maximum of 1ØØ ppm to a minimum of 21 ppm giving an average value of 65 mg/1 BOD.

Spot samples taken in 1986 had BOD values ranging from a minimum of 1Ø6 ppm to a maximum of 16Ø ppm.

This treatment works needs to be replaced immediately as the loading on it far exceeds it's capacity.

North Cork Creameries

Approximately 455 m^3/day of effluent is discharged via a treatment works to the River Allow 2Ø metres d/s of the Kanturk S.T.W. outfall.

The creamery is the third largest in the Blackwater catchment and produces butter, cheese and milk.

The volume of effluent discharged to the river is 455 m^3/day and the organic loading is 1Ø kg BOD/day.

MALLOW DISCHARGES
==========

Scheme	Vol. Discharged m3/day	Kg BOD/day
C.S.E.T.	5Ø,ØØØ	4Ø,ØØØ
Ballyclough Co-Op	3,182	89
Mallow S.T.W.	1,7Ø1	46
Mallow Mart	136	4Ø

C.S.E.T.

This company is involved in the processing and refining of sugar beet. It is a seasonal industry being active from October to December inclusive.

It is located 3.5 km u/s Mallow and it's water usage is in the region of 5Ø,ØØØ m3/day. The effluent discharge point is located 1.Ø km u/s of the factory on the River Blackwater.

The water is used for washing the beet and transporting same to the processing area. It is then pumped along with contaminated surface water to a sedimentation tank. Here the solids are settled out and are then pumped as "mudwater" to lagoons for storage and treatment. The effluent from the lagoons is discharged intermittently to the River Blackwater at a point 2ØØ metres u/s Longfields Bridge when the flow in the river is greater than 55 m^3/sec.

The maximum rate of discharge is limited to Ø.52 m^3/sec giving a minimum dilution of 1/1ØØ.

The BOD loading from the lagoons at maximum discharge rate is in the region of 4Ø,ØØØ kg. BOD/day. This is equivalent to 26 times the BOD load for the rest of the catchment.(P.E. 5ØØ,ØØØ)

Even though the discharge can cause the BOD of the river to reach 2Ø ppm 4.2 km. d/s at the Ten Arches Bridge, the D.O. level is not greatly affected. This is probably due to the relatively low water temperatures and the increased reoxygenation caused by the turbulance in the river due to high flow.

The main effect of the C.S.E.T. discharge is the development of sewage fungus in the river below the outfall. This can be traced as far as Kilavullen (17 km. d/s) and beyond sometimes.

Sewage fungus (Sphaenotilus Nataus) thrives on the nutrients available in the C.S.E.T. effluent and the reduced competition from other species during winter.

Due to high winter flows it is difficult to study the extent and effect of the sewage fungus cover on the river bed during the beet campaign.

The possible detrimental effects of sewage fungus on the Mallow stretch of the Blackwater would include a reduction of food organisms of fish and an increase in silting up of the river bed.

Experiments with the rate and period of dischargeing have been carried out in an effort to find the best discharge regime.

Planning permission for extending C.S.E.T.'s lagoons at Newberry, Mallow includes conditions which set a limit of 25Ø ppm BOD for the effluent and the u/s BOD level of the river shall not be increased by more than 1 mg/litre at the Ten Arches Bridge sampling point.

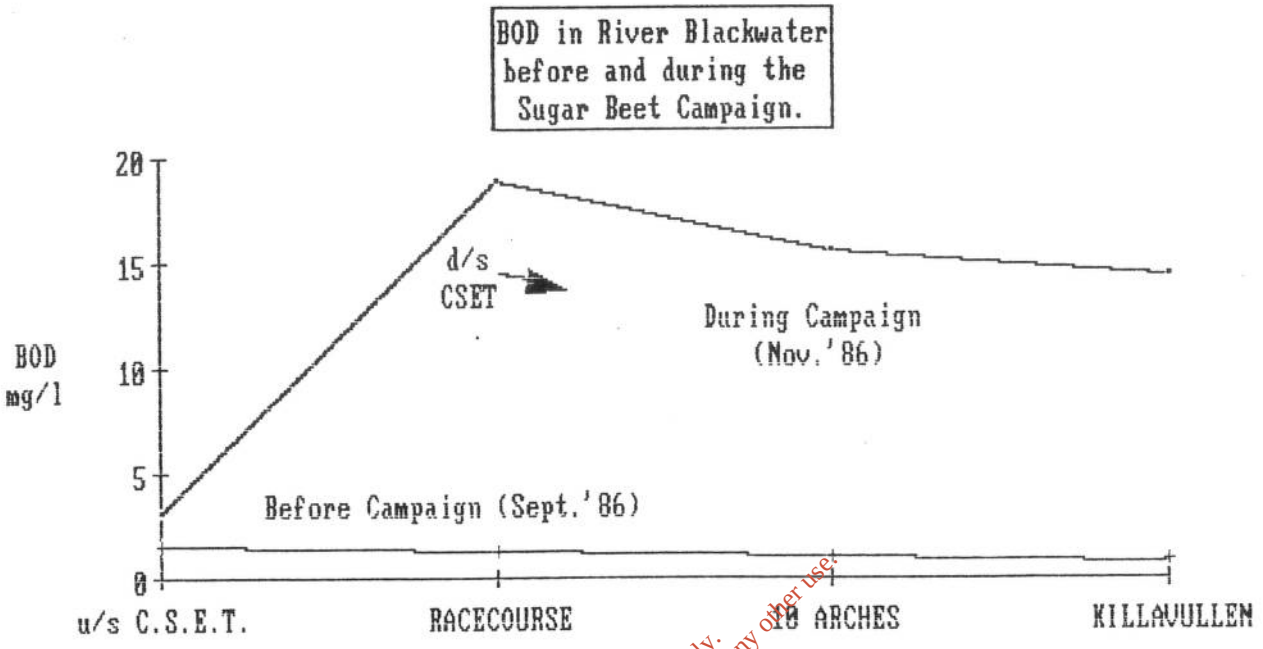
It is envisaged that these conditions will be met by the start of the 1987 - 1988 beet campaign.

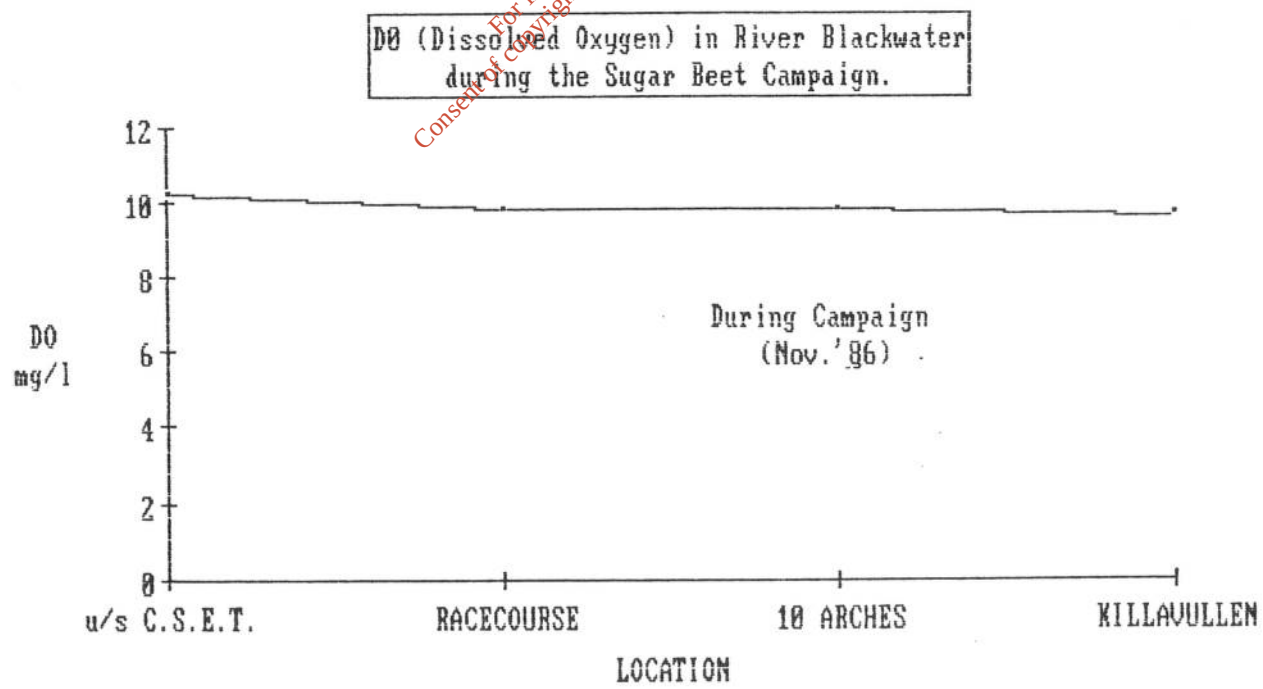
To meet these conditions it may be necessary to extend the present effluent storage facilities to improve the quality of the final effluent through anaerobic action. Additional treatment of the effluent may also be necessary.

A stream that flows through the east end of the C.S.E.T. grounds is also a serious source of pollution to the main channel. Whilst the flow rate is not as great as that from the lagoons, it can exceed 4545 m^3/day. The BOD has been measured at 35Ø ppm, and the stream's temperature has at times been more than 1Ø degrees higher than the temperature of the river Blackwater into which it flows.

The stream has caused considerable fungus growth in the main channel in the past before the start of the beet campaign at times of low to medium flows.

FIGURE 3.7 VARIATION OF BOD AND DO IN BLACKWATER DURING SUGAR BEET CAMPAIGN





Discharges from the vegetable processing plant adjacent to the sugar factory are thought to be a source of pollution to this stream, whilst leakages of cooling water from C.S.E.T. during the beet campaign add to the problem.

Ballyclough Co-Op

This firm is engaged in the processing of raw milk and in the production of various dairy products. These include milk, butter, dried milk powder and chocolate crumb. (Borden Company)

The treated effluent is discharged directly to the River Blackwater at a point 5ØØ metres u/s Mallow Bridge.

The volume of effluent is 3182 m^3/day and the waste load is 89 kg BOD/day.

A small stream which runs through the factory grounds shows signs of occasional pollution; this stream receives cooling water from the factory as well as storm overflow from a section of the Mallow Urban drainage system (Estimated load = ??? houses).

Samples were taken of the stream u/s and d/s of the factory in June 1986 and September 1986. The results were as follows:

Date	Sample Point	S.S.	B.O.D.
11/Ø6/86	u/s Ballyclough Factory	4.Ø	2.1
	d/s Ballyclough Factory	17.Ø	33.Ø
Ø9/Ø9/86	u/s Ballyclough Factory	2.Ø	1.6
	d/s Ballyclough Factory	1Ø.Ø	8.Ø

It is to be noted that the d/s sample was u/s of the storm overflow outfall, and no flow was coming from same at the time.

The above results indicate that a considerable amount of polluting matter is being discharged to the stream in addition to the cooling water for which a licence was granted.

The sources of the above pollution will have to be located and steps taken to eliminate same by Ballyclough Co-Op.

Mallow S.T.W.

These treatment works are located 2 km d/s of Mallow town and were opened in 1984 with the present population served = 7,5ØØ. The volume treated is 17Ø1 m^3/day. The waste load is 46 kg BOD/day. The treated effluent is discharged directly to the River Blackwater.

MITCHELSTOWN DISCHARGES
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Scheme	Vol. Discharged (m^3/day)	Kg.BOD/day
Mitchelstown S.T.W.	750	20
Mitchelstown Co-Op	5683	171

Mitchelstown S.T.W.

Mitchelstown S.T.W. was built in 1956. It's design P.E. was 11,000 to cater for the public sewage, and also to cater for the wastes from Mitchelstown Co-Op. It discharged to the River Gradoge at a point 800m u/s of the confluence with the River Funchion.

A new effluent pipe was laid in 1985 and the new discharge point is located on the River Funcheon at a point 100 m d/s of the River Gradogue confluence.

The Co-Op constructed their own treatment works in 1985, and the present loading of the town's sewage works is about 20 kg BOD/day with a P.E. of 6000.

Mitchelstown Co-Op

As mentioned above the Co-Op constructed a new treatment works in 1985 and the effluent from this discharges to the River Funchion at the same location as the effluent from the town's sewerage works discharges.

The volume of effluent is 5683 m^3/day and the waste load is 171 Kg. BOD/day.

Despite the moving of the discharge point from the Gradoge to the Funchion, the River Gradoge remains in a seriously polluted condition (c.f. AFF 1986).

The pollution loading of the Gradoge seriously depresses water quality in the Funchion into which it flows. The effects of this pollution can be traced downstream for a distance of 10 km.

The main sources of pollution in the Gradoge u/s of Mitchelstown are agricultural and d/s of Mitchelstown the entry of a grossly polluted stream (Mill Race) to the Gradoge at a point 700 m from the confluence with the Funshion.

Large quantities of milk wastes and contaminated cooling water continue to escape into the Mill Race despite the Co-Op's efforts to prevent same.