

APPENDIX 2.4.11
Groundwater Response Matrix for Landfills

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Groundwater Protection Responses for Landfills – Summary

Response Matrix for Landfills

VULNERABILITY RATING	SOURCE PROTECTION AREA		RESOURCE PROTECTION Aquifer Category					
			Regionally Important (R)		Locally Important (L)		Poor Aquifers (P)	
	Inner	Outer	Rk	Rf/Rg	Lm/Lg	LI	PI	Pu
Extreme (E)	R4	R4	R4	R4	R3 ²	R2 ²	R2 ²	R2 ¹
High (H)	R4	R4	R4	R4	R3 ¹	R2 ¹	R2 ¹	R1
Moderate (M)	R4	R4	R4	R3 ¹	R2 ²	R2 ¹	R2 ¹	R1
Low (L)	R4	R3 ¹	R3 ¹	R3 ¹	R1	R1	R1	R1

In all cases standards prescribed in the *EPA Landfill Site Design Manual (EPA,1999)* or conditions of a waste licence will apply.

R1 Acceptable subject to guidance in the EPA Landfill Design Manual or conditions of a waste licence.

R2¹ Acceptable subject to guidance outlined in the EPA Landfill Design Manual or conditions of a waste licence.

- Special attention should be given to checking for the presence of high permeability zones. If such zones are present then the landfill should only be allowed if it can be proven that the risk of leachate movement to these zones is insignificant. Special attention must be given to existing wells down-gradient of the site and to the projected future development of the aquifer.

R2² Acceptable subject to guidance outlined in the EPA Landfill Design Manual or conditions of a waste licence.

- Special attention should be given to checking for the presence of high permeability zones. If such zones are present then the landfill should only be allowed if it can be proven that the risk of leachate movement to these zones is insignificant. Special attention must be given to existing wells down-gradient of the site and to the projected future development of the aquifer.
- Groundwater control measures such as cut-off walls or interceptor drains may be necessary to control high water table or the head of leachate may be required to be maintained at a level lower than the water table depending on site conditions.

R3¹ Not generally acceptable, unless it can be shown that:

- the groundwater in the aquifer is confined; or
- there will be no significant impact on the groundwater; and
- it is not practicable to find a site in a lower risk area.

R3² Not generally acceptable, unless it can be shown that:

- there is a minimum consistent thickness of 3 metres of low permeability subsoil present;
- there will be no significant impact on the groundwater; and
- it is not practicable to find a site in a lower risk area.

R4 Not acceptable.

- This guidance is for the siting of landfills for non-hazardous wastes.
- New landfills should not generally be developed on regionally important aquifers.
- The siting, design, operation and monitoring of landfills must comply with the guidelines outlined in the EPA's Landfill manuals except where facilities hold a waste licence issued by the EPA.
- It is recommended that all landfills be located in, or as near as possible to, the zone in the bottom right hand corner of the matrix.
- Special attention should be given to checking for the presence of more permeable zones, such as faults, particularly in fractured bedrock.

APPENDIX 2.4.12
Public Drinking Water Supply Source, Johnstown
Bridge, County Kildare

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● Production Well Location


LEGEND

SCALE 1:50,000

KILOMETRES

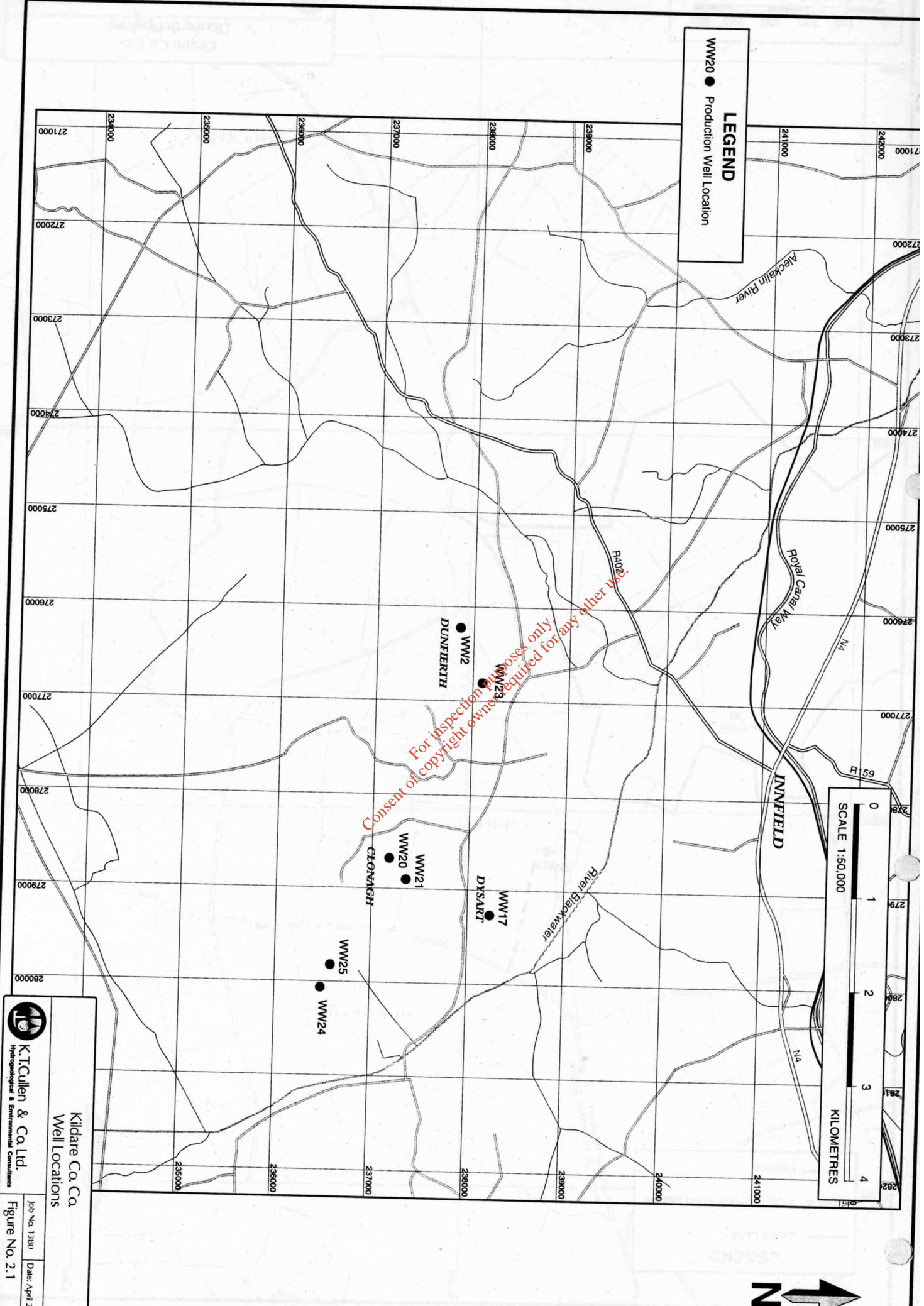


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**K.T. Cullen & Co. Ltd.**
Hydrogeological & Environmental Consultants

Kildare Co. Co.
Well Locations

Job No. 1380 | Date: April 2
Figure No. 2.1





LEGEND

- Inner Protection Zone
- Outer Protection Zone
- WW20 ● Production Well Location



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Kildare Co. Co.
Source Protection Areas

K.I.Cullen & Co. Ltd.
Hydrogeological & Environmental Consultants

Job No. 1380 Date: April 2002
Figure No. 4.5.1

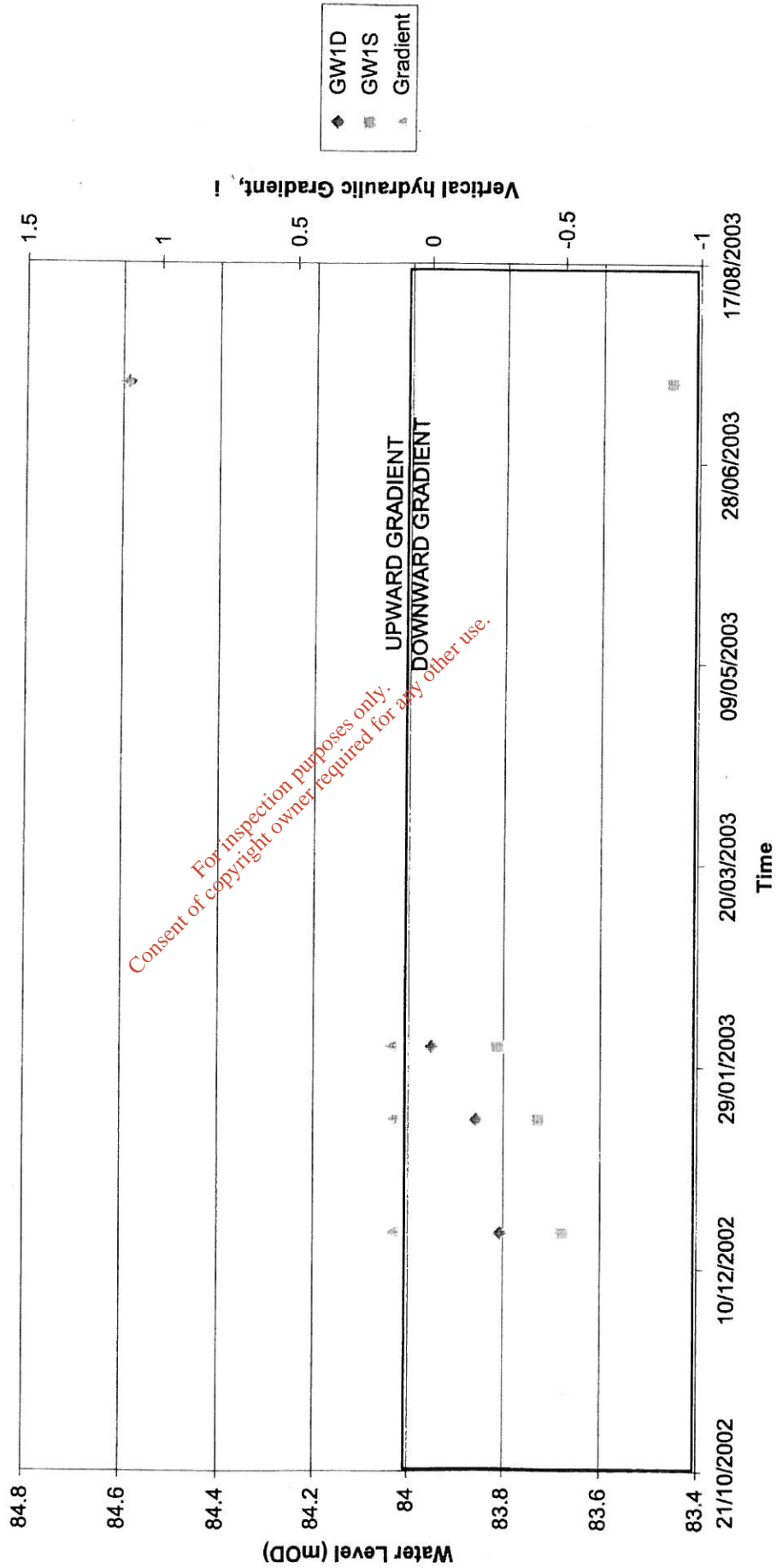
APPENDIX 2.4.13
SWL's Calculation Sheets and Graphs for
Borehole Pairs

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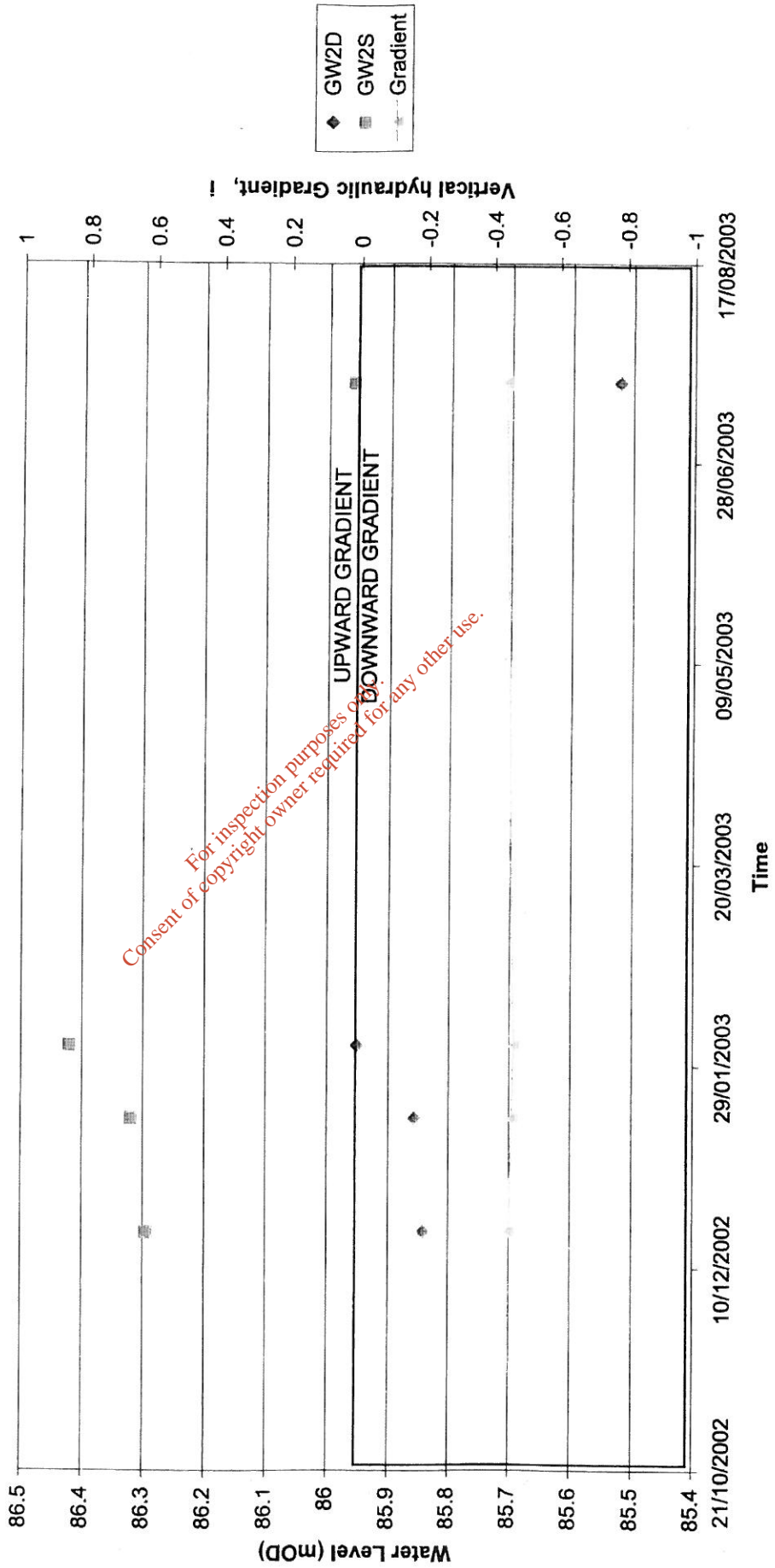
Water Levels					
mOD					
	19/12/2002	16/01/2003	03/02/2003	18/07/2003	Mean
GW1D	83.086	83.856	83.951	84.586	83.870
GW1S	83.677	83.727	83.812	83.457	83.668
GW2D	85.842	85.857	85.952	85.522	85.793
GW2S	86.295	86.32	86.42	85.96	86.249
GW3D	83.485	83.505	83.59	83.245	83.456
GW3S	82.748	82.998	83.068	82.778	82.898
GW4D	83.872	83.932	84.012	83.632	83.862
GW4S	84.213	83.393	83.413	83.433	83.613
GW5D	84.895	84.895	85.01	84.57	84.843
GW5S	85.154	85.154	85.224	85.724	85.314
GW6	No Data	83.782	84.242	83.827	83.950

Calculated Gradients, i					
	19/12/2002	16/01/2003	03/02/2003	18/07/2003	Mean
GW1D					
GW1S	-0.591	0.129	0.139	1.129	0.2015
GW2D					
GW2S	-0.453	-0.463	-0.468	-0.438	-0.455
GW3D					
GW3S	0.737	0.507	0.522	0.467	0.558
GW4D					
GW4S	-0.341	0.539	0.599	0.199	0.249
GW5D					
GW5S	-0.259	-0.259	-0.214	1.154	-0.472
GW1					
GW6	No Data	0.055	0.43	0.37	0.285

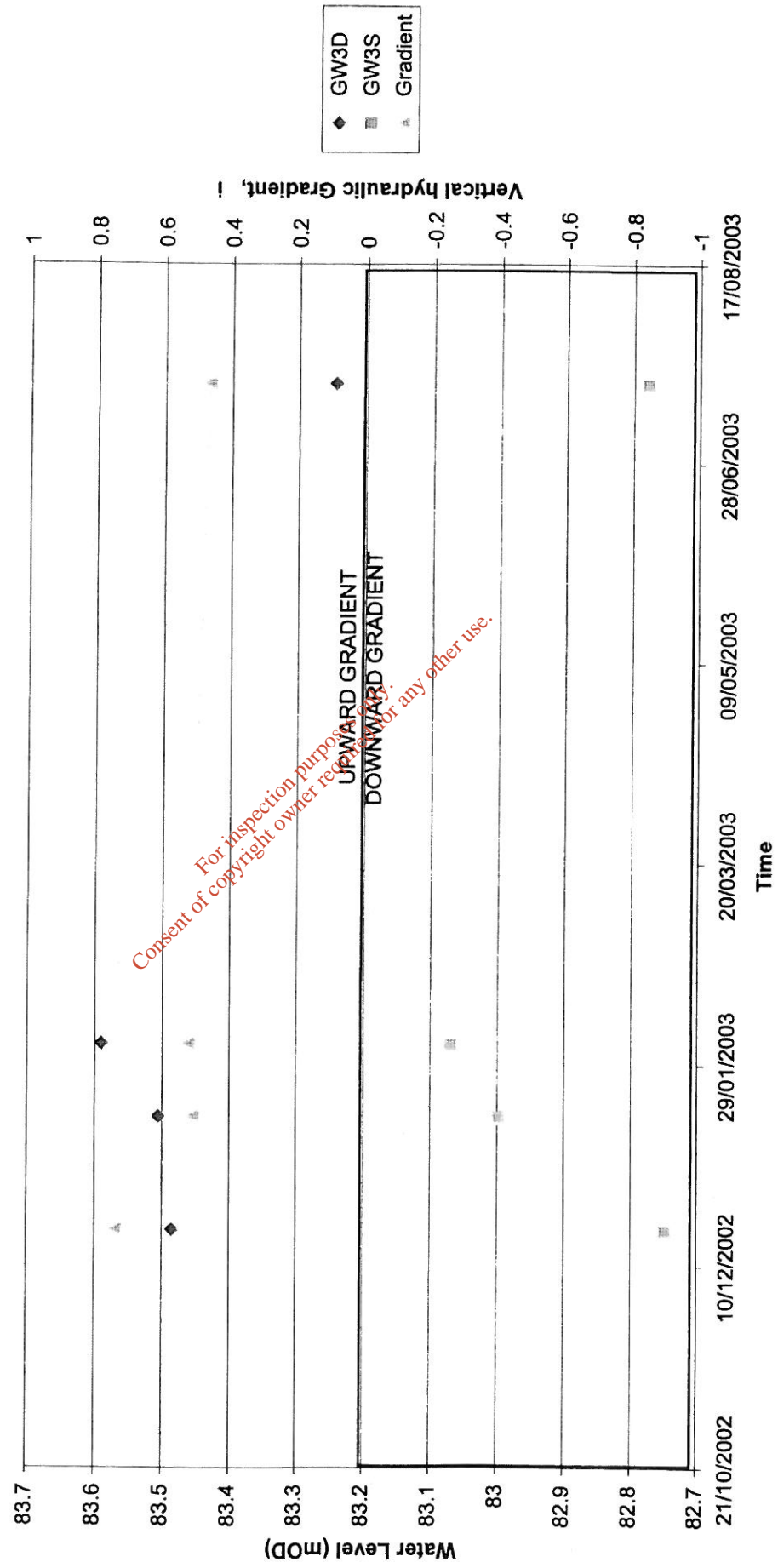
Drehid GW1D & GW1S Piezometer pair Water Levels & Vertical Gradients
 (+ve gradients = flow upwards; -ve gradients = flow downwards)



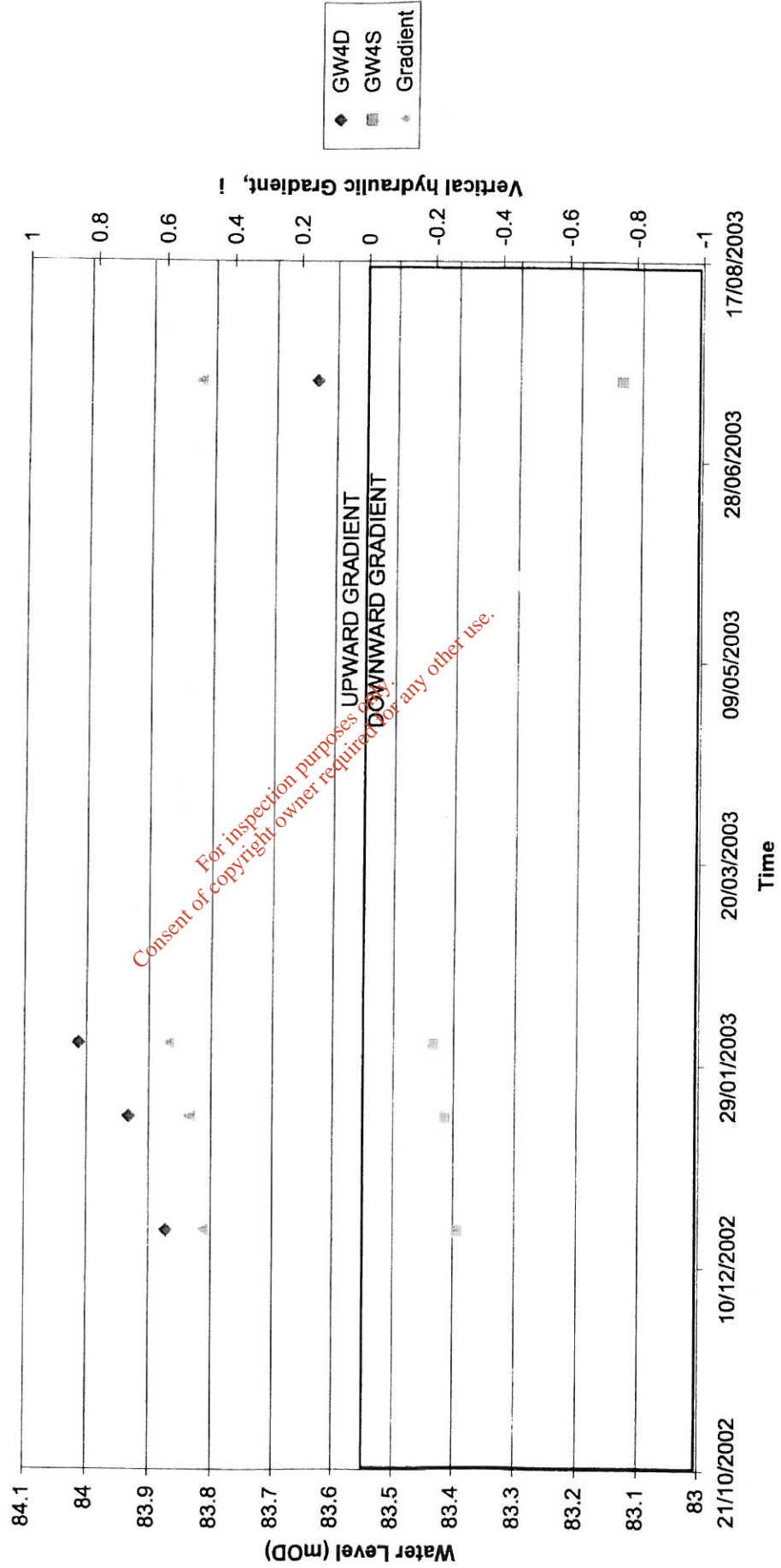
Drehid GW2D & GW2S Piezometer pair Water Levels & Vertical Gradients
 (+ve gradients = flow upwards; -ve gradients = flow downwards)



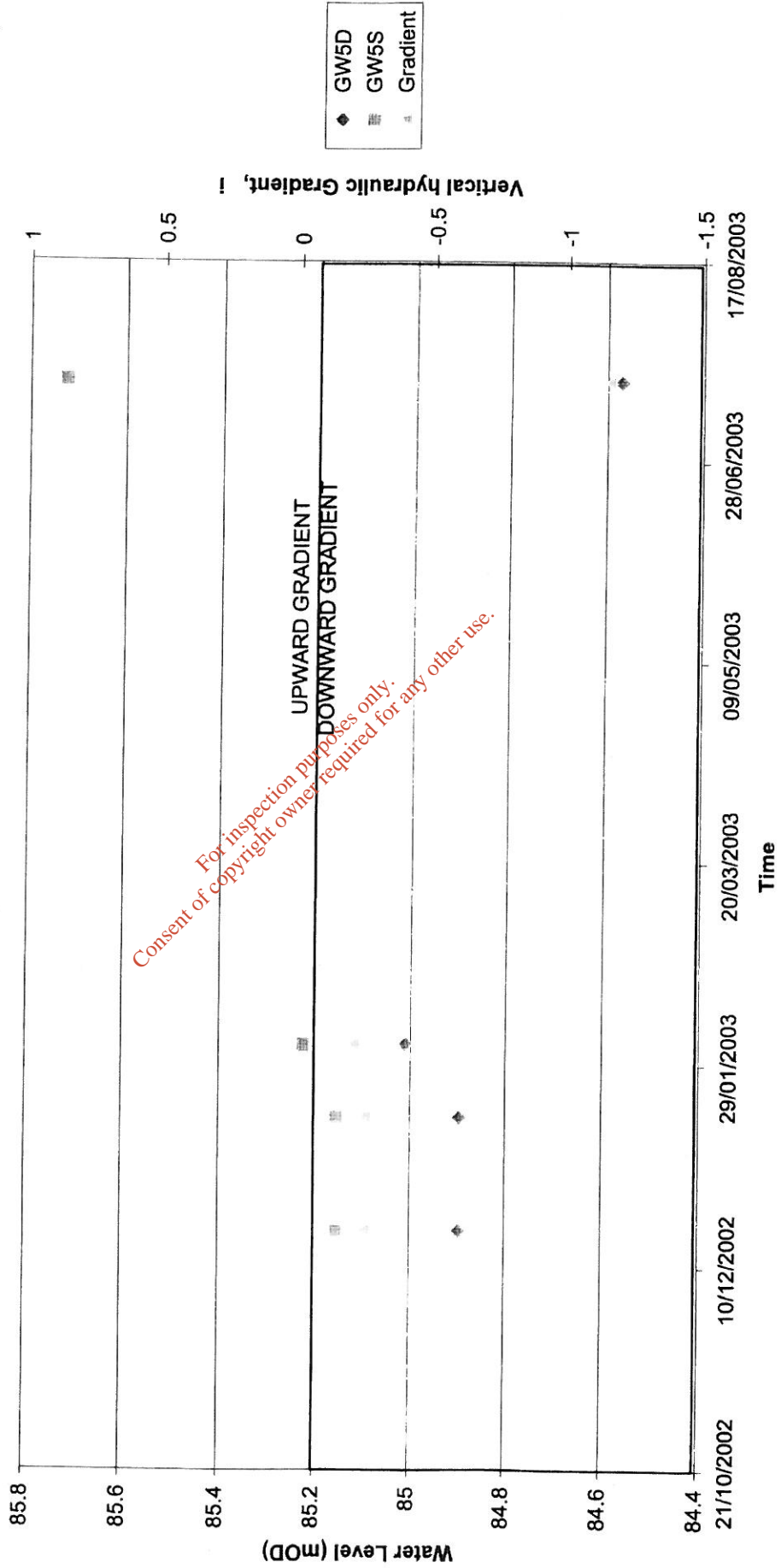
Drehid GW3D & GW3S Piezometer pair Water Levels & Vertical Gradients
 (+ve gradients = flow upwards; -ve gradients = flow downwards)



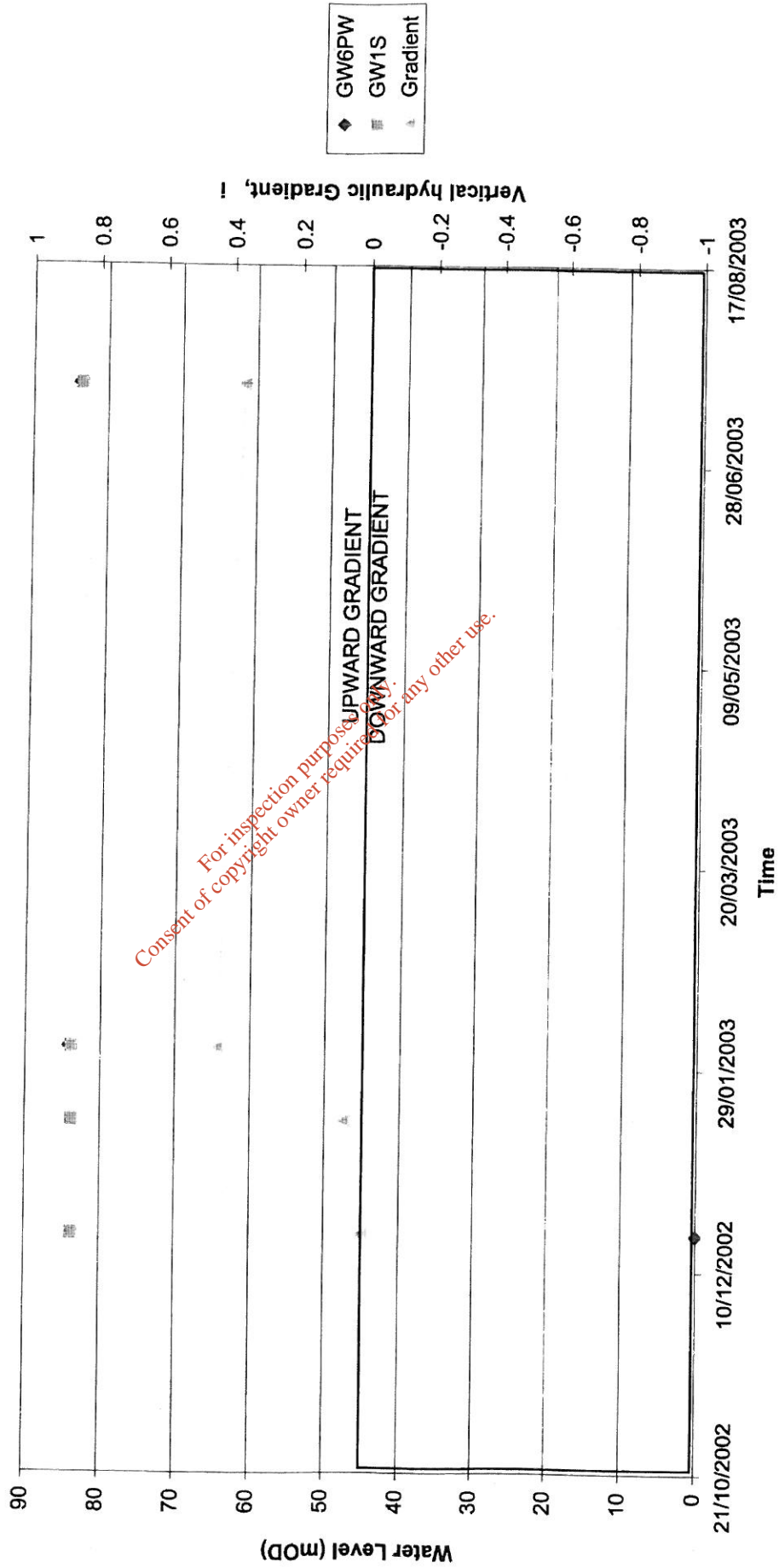
Drehid GW4D & GW4S Piezometer pair Water Levels & Vertical Gradients
 (+ve gradients = flow upwards; -ve gradients = flow downwards)



Drehid GW5D & GW5S Piezometer pair Water Levels & Vertical Gradients
 (+ve gradients = flow upwards; -ve gradients = flow downwards)



Drehid GW6PW & GW1S Piezometer pair Water Levels & Vertical Gradients
 (+ve gradients = flow upwards; -ve gradients = flow downwards)



APPENDIX 2.5.1
Hydrometric Information from EPA/OPW

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STATION NAME
STATION No.
RIVER
CATCHMENT

CLOMBULLOGUE BRIDGE
14004
FIGILE
BARROW

OFFICE OF PUBLIC WORKS
HYDROMETRIC SECTION
31-Jan-02

Annual Maximum Series of Recorded Water Levels and Estimated Flows

HYDROMETRIC YEAR	WATER LEVEL (mAOD - Poolbeg)	S.G. READING (m)	ESTIMATED FLOWS (m3/s)	DATE OF MAX FLOW
1957	67.9	1.34	21.05	20/08/1958
1958	67.77	1.21	18.33	27/12/1958
1959	68.41	1.85	32.96	15/09/1960
1960	68.27	1.71	29.51	09/10/1960
1961	67.77	1.21	18.33	26/09/1962
1962	67.74	1.18	17.72	08/12/1962
1963	67.57	1.01	14.40	21/11/1963
1964	68.19	1.63	27.59	13/12/1964
1965	68.62	2.06	38.40	19/11/1965
1966	67.96	1.40	22.35	28/02/1967
1967	67.84	1.28	19.78	19/08/1968
1968	68.53	1.97	36.03	26/12/1968
1969	67.93	1.37	21.70	25/04/1970
1970	67.69	1.13	16.72	04/11/1970
1971	68.05	1.49	24.36	05/07/1972
1972	67.67	1.11	16.23	13/11/1972
1973	68.12	1.56	23.68	08/09/1974
1974	68.21	1.65	25.73	28/09/1974
1975	68.32	1.76	28.30	03/10/1975
1976	67.81	1.25	17.11	22/02/1977
1977	67.8	1.24	16.92	31/10/1977
1978	68.17	1.61	27.12	28/12/1978
1979	68.06	1.50	24.47	19/03/1980
1980	68.11	1.55	25.73	23/10/1980
1981	67.92	1.41	22.57	15/12/1981
1982	68.01	1.50	24.58	01/02/1983
1983	68.01	1.50	24.58	10/12/1983
1984	67.88	1.37	21.59	15/12/1984
1985	67.72	1.21	18.33	26/08/1986
1986	67.75	1.24	18.94	19/01/1987
1987	67.96	1.45	23.46	22/10/1987
1988	67.54	1.03	14.78	23/09/1989
1989	68.31	1.80	31.71	08/02/1990
1990	67.53	1.02	14.59	13/04/1991
1991	67.62	1.11	16.23	13/09/1992
1992	68.16	1.65	27.95	13/06/1993
1993	67.85	1.34	21.05	09/12/1993
1994	68.24	1.73	29.87	29/01/1995
1995	67.53	1.02	14.59	13/03/1996
1996	67.46	0.95	13.20	01/09/1997
1997	67.58	1.07	15.55	09/01/1998
1998	67.57	1.06	15.35	06/01/1999
1999	67.51	1.00	14.22	13/01/2000
2000	67.97	1.46	23.68	08/11/2000

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Limit of reliable rating is 34 m3/s - Flow values above this have been extrapolated and should be treated with caution

Hydrometric years run from the 1st October to 30th September, e.g., hydrometric year 1980 begins on 1st October 1980.

Current Staff Gauge Zero = 66.51 mAOD (Poolbeg)

The Commissioners of Public Works will not be responsible for any loss or damage howsoever arising from the use or interpretation of these data.

Year	Average Water Level
DATE	Water Level (m)
1982	1.039
1983	1.252
1984	1.304
1985	No Value Avail
1986	1.002
1987	0.83
1988	0.888
1989	0.9
1990	1.074

Year	Maximum Water Level
DATE	Water Level (m)
1982	2.034
1983	3.078
1984	3.032
1985	No Value Avail
1986	2.94
1987	2.821
1988	1.488
1989	1.504
1990	3.322

Hydrometric Data for River Blackwater at Johnstown Bridge

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Year	Average Water Level
1982	1.039
1983	1.252
1984	1.304
1985	No Value Avail
1986	1.009
1987	0.93
1988	0.835
1989	0.9
1990	1.074

Max. Monthly Levels

Minimum Year Water Level
Water Level (m)
DATE

Max. Monthly Levels

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Date

Maximum Year Water Level

DATE	Water Level(m)
31/10/1982	2.034
31/01/1983	3.018
09/12/1983	3.033
01/11/1984	No Value Avail
26/08/1986	2.91
18/01/1987	2.821
26/10/1988	1.485
15/03/1989	1.504
06/02/1990	3.322
17/11/1990	2.464

CLONBULLOGUE BRIDGE
14004
FIGLE
BARROW

OFFICE OF PUBLIC WORKS
HYDROMETRIC SECTION
31-Jan-02

Annual Maximum Series of Recorded Water Levels and Estimated Flows

HYDROMETRIC YEAR	WATER LEVEL (mAGD - PacBag)	SL. READING (m)	ESTIMATED FLOWS (m ³ /s)	DATE OF MAX FLOW
1967	87.9	1.34	21.03	20/03/1968
1968	87.77	1.21	18.33	27/12/1968
1969	88.41	1.85	32.96	16/09/1969
1970	88.27	1.71	28.51	08/10/1970
1971	87.77	1.21	18.33	25/09/1972
1972	87.74	1.18	17.72	08/12/1972
1973	87.37	1.01	14.40	21/11/1973
1974	88.19	1.83	27.59	13/12/1974
1975	88.02	2.08	38.40	18/11/1975
1976	87.88	1.40	22.35	28/02/1977
1977	87.84	1.28	18.78	10/08/1978
1978	88.58	1.87	35.03	28/07/1979
1979	87.93	1.28	21.70	07/04/1980
1980	88.05	1.49	24.35	09/11/1980
1981	88.09	1.50	24.58	05/07/1982
1982	88.12	1.56	25.68	13/11/1982
1983	88.21	1.65	26.73	05/05/1984
1984	88.32	1.76	28.30	25/02/1984
1985	87.81	1.41	17.11	03/10/1985
1986	87.8	1.41	17.11	22/02/1987
1987	88.17	1.52	18.92	31/10/1987
1988	88.06	1.50	24.47	28/12/1988
1989	88.11	1.55	24.47	18/03/1990
1990	87.82	1.41	22.87	23/10/1990
1991	88.09	1.80	24.58	12/12/1991
1992	88.09	1.80	24.58	01/02/1993
1993	88.09	1.80	24.58	10/12/1993
1994	88.09	1.80	24.58	13/02/1994
1995	87.75	1.21	18.33	26/09/1995
1996	87.75	1.24	18.94	10/01/1997
1997	87.96	1.45	23.48	22/10/1997
1998	87.54	1.03	14.78	23/08/1998
1999	88.31	1.80	31.71	06/02/1999
2000	87.83	1.02	14.59	13/04/1999
2001	87.82	1.11	18.23	10/03/2001
2002	88.18	1.50	27.95	13/03/2002
2003	87.88	1.34	21.05	03/12/1999
2004	88.24	1.73	29.87	26/01/1997
2005	87.83	1.02	14.59	13/03/1999
2006	87.46	0.85	13.20	01/09/1999
2007	87.78	1.07	15.56	08/01/1999
2008	87.87	1.08	15.25	05/01/1999
2009	87.84	1.00	14.23	13/01/1999
2010	87.87	1.49	23.68	08/11/1999

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Limit of reliability rating is 34 m³/s - Flow values above this have been extrapolated and should be treated with caution

Hydrologic years run from the 1st October to 30th September, e.g., hydrologic year 1980 begins on 1st October 1980

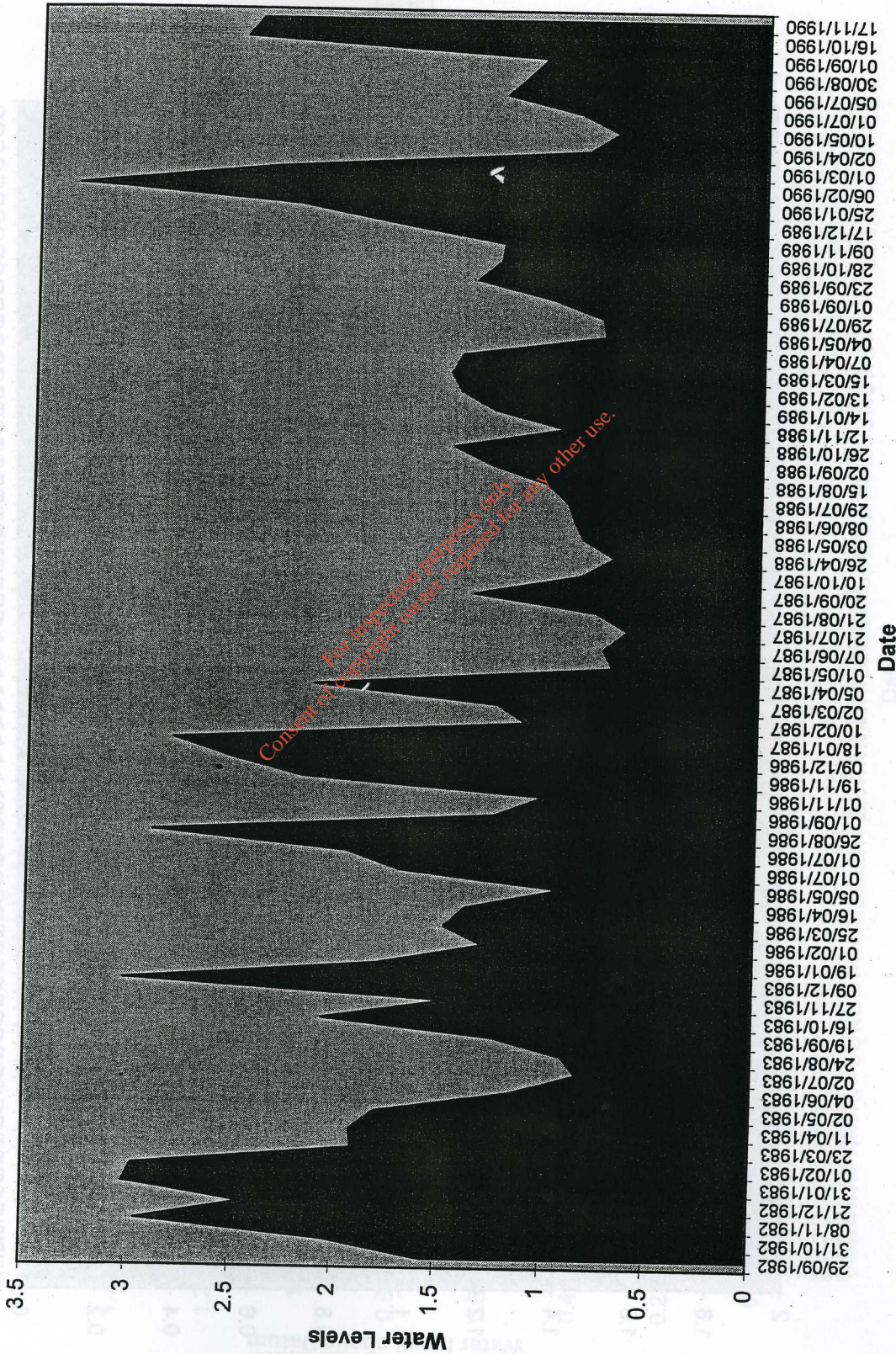
Current Staff Gauge Zero = 88.51 mAGD (PacBag)

The Commissioners of Public Works will not be responsible for any loss or damage howsoever arising from the use or interpretation of these data.

DATE	Water Level(m)	Year Average Water Level (m)
19/09/1982	0.737	1.039
15/08/1983	0.712	1.252
23/11/1983	0.84	1.304
01/11/1984	No Value available	No Value Avail
15/03/1986	0.732	1.008
07/07/1987	0.521	0.93
18/06/1988	0.677	0.838
19/10/1989	0.655	0.9
11/12/1989	0.61	1.074
11/11/1990	0.879	

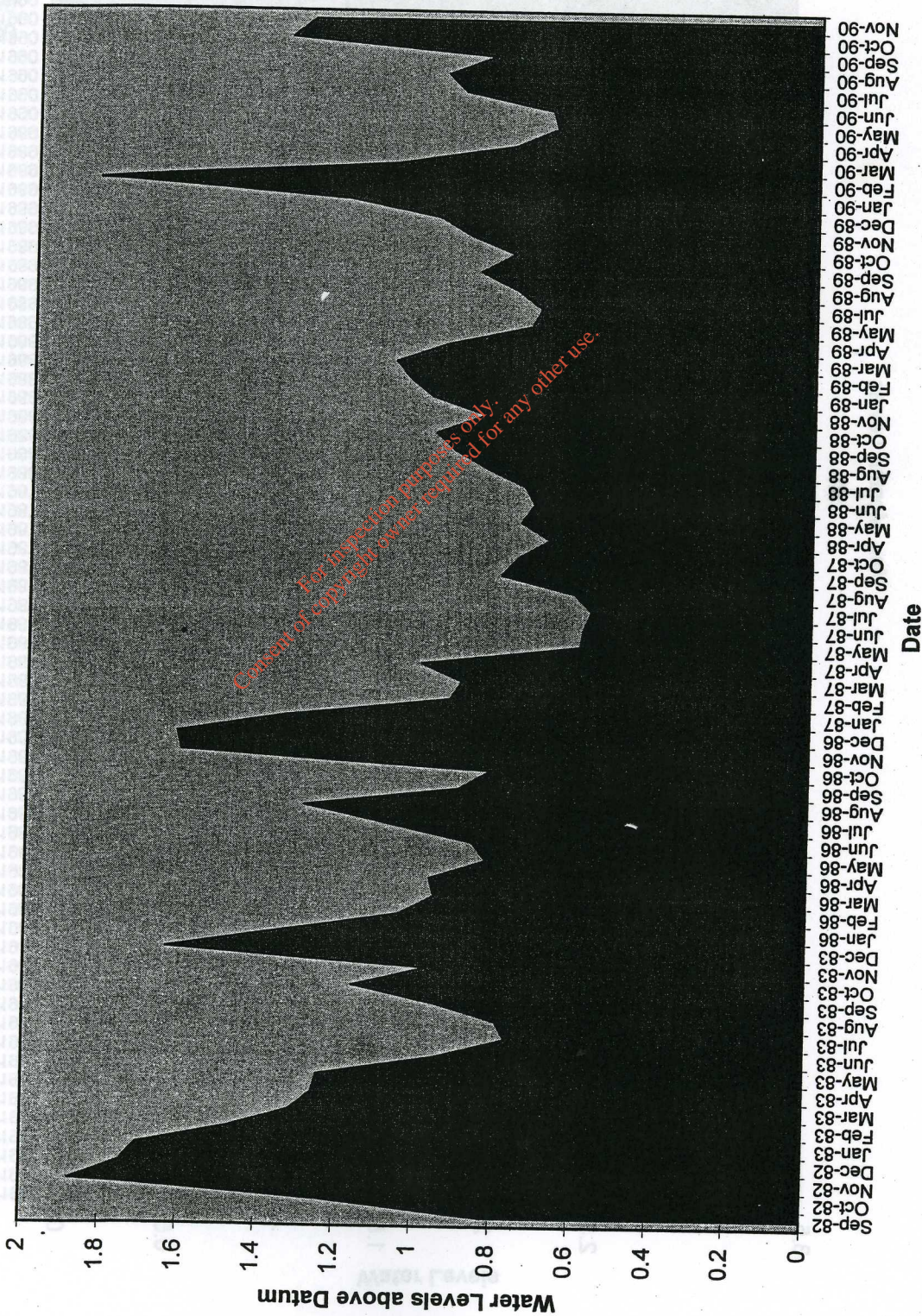
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Max. Monthly Levels



Mean Monthly Levels

Mean Monthly Water Levels



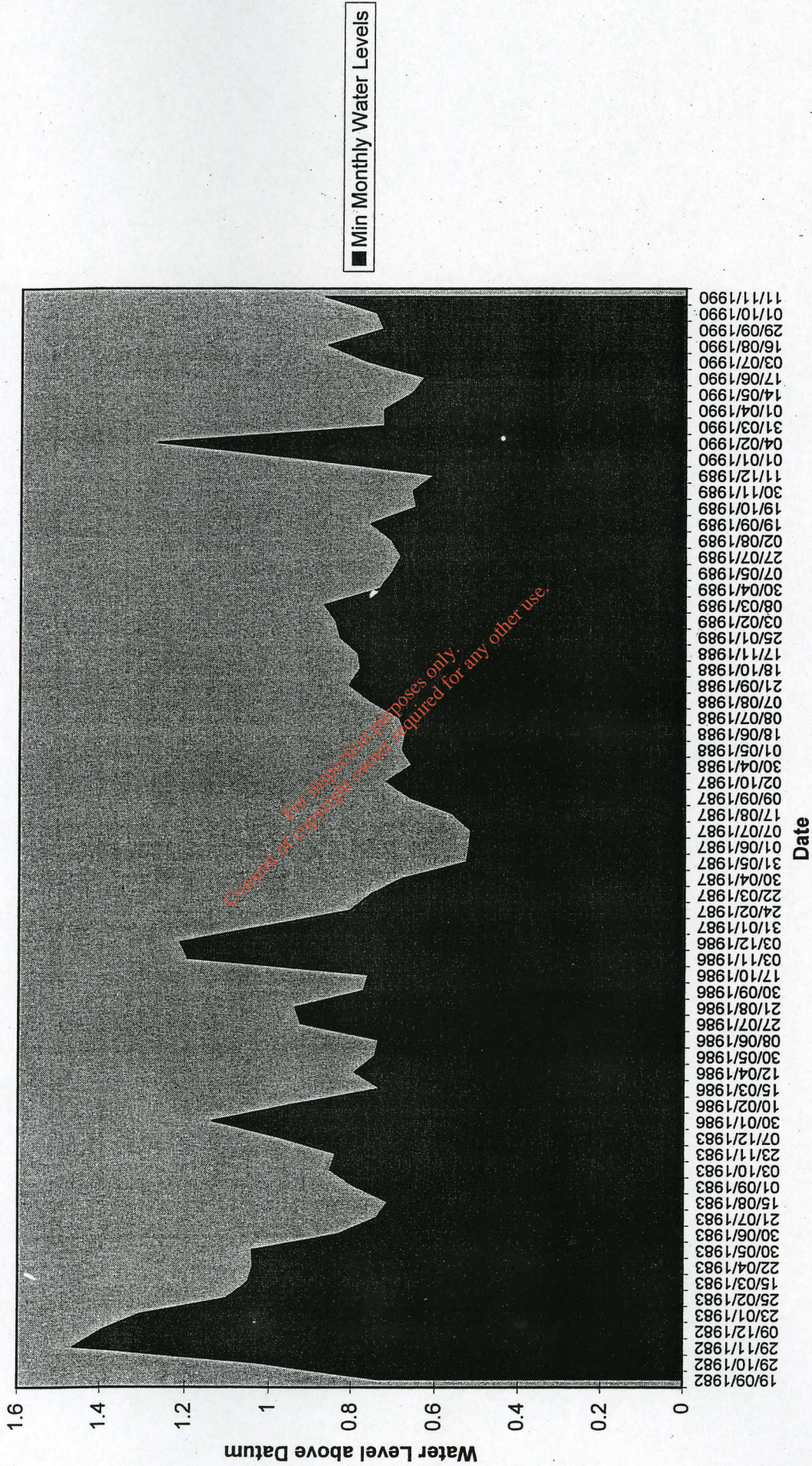
Minimum Year Water Level

DATE	Water Level(m)
10/09/1982	0.737
10/05/1983	0.712
23/11/1983	0.84
01/11/1984	No Value available
10/03/1989	0.732

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Min Monthly Levels

Min Monthly Water Levels



Hydrometric Data for River Figle at Clonbulloge

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Summary Statistics Data

Daily Mean Flow Data • Daily Mean Level Data • Annual Maxima Data

GENERAL STATION DETAILS			
Station Name: Clonbulloge	Station No: 14004	Watercourse: Figile	NGR: N 609 235
Catchment Area (km ²): 268	Catchment: Barrow	Gauge Type: AR	Datum: Poolbeg

SUMMARY HYDROMETRIC STATISTICS
Annual Average Rainfall (mm) ¹ : 850
Est'd Annual Losses (mm) ¹ : 456
Mean Annual Flow (m ³ /s): - (Data derived for the period - to -)

STATION HISTORY
Period of Continuous Hardcopy Records: 1958 to 2002
Period of Digitised Record: 1972 to 2002

Note 1 : Data extracted from the Environmental Protection Agency publication 'Hydrological Data', July 1997

DURATION PERCENTILES							
Flows equalled or exceeded for the given percentage of time (m ³ /s) (Data derived for the period - to -)							
1%	5%	10%	50%	80%	90%	95%	99%
-	-	-	-	-	-	-	-
Levels equalled or exceeded for the given percentage of time (mAOD Poolbeg) (Data derived for the period - to -)							
1%	5%	10%	50%	80%	90%	95%	99%
-	-	-	-	-	-	-	-

COMMENTS / NOTES
No low or medium flow data.

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15 August 2003

TES Consulting Engineers,
Unit 4, Blanchardstown Corporate Park,
Dublin 15.

For the attention of Mr. Mark Conroy

Re; Flow Data and Annual Maxima Series at Clonbulloge (Stn. 14004)

Dear Mark,

With reference to your fax of May 12th and subsequent correspondences, please find attached the estimated daily mean flows along with the recorded water levels for the autographic recorder station at Clonbulloge (Stn. 14004) for the period 1972 to 2001.

The flows have been estimated from recorded water levels and a rating curve developed from a series of flow measurements. The measurements have been taken in the range of 0.2 to 34 m³/s. Any flow estimates made outside of this range have been derived from an extrapolation of the rating and may be unreliable.

Please also find the annual maxima series of water levels for the period 1972 to 2000 and note that flood levels may vary significantly up and downstream from a given location. We would therefore recommend that if the site of the proposed works is distant from the station then the attached data should be used for indicative purposes only unless detailed hydraulic analysis is undertaken.

It should further be noted that for various reasons the recorder has not functioned continuously and that there are gaps in the record. It is therefore possible that the water level has risen above the maxima given

Please do not hesitate to contact us if you have any further queries.

Yours sincerely

Cyril Mc Carthy
Hydrology and Hydrometric Section

IMPORTANT NOTE

The data being supplied have been produced and quality controlled in accordance with the Quality Assurance Policy of the Hydrology and Hydrometric Section of the OPW. This does not however guarantee accuracy or fitness for use, and it is the responsibility of the user to ensure that the data, if used, are accurate and fit for purpose. The source and processed data, and details of the Quality Assurance Policy of the Section, are available in the OPW Office in Dublin for inspection on prior arrangement for this purpose.

The Commissioners of Public Works will not be responsible for any loss or damage howsoever arising from the use or interpretation of this data, and reserve the absolute right to reprocess the data as it deems necessary.

STATION NAME
 STATION No.
 RIVER
 CATCHMENT

CLONBULLOGUE BRIDGE
 14004
 FIGILE
 BARROW

OFFICE OF PUBLIC WORKS
 HYDROMETRIC SECTION
 31-Jan-02

Annual Maximum Series of Recorded Water Levels and Estimated Flows

HYDROMETRIC YEAR	WATER LEVEL (mAOD - Poolbeg)	S.G. READING (m)	ESTIMATED FLOWS (m3/s)	DATE OF MAX FLOW
1957	67.9	1.34	21.05	20/08/1958
1958	67.77	1.21	18.33	27/12/1958
1959	68.41	1.85	32.96	15/09/1960
1960	68.27	1.71	29.51	09/10/1960
1961	67.77	1.21	18.33	26/09/1962
1962	67.74	1.18	17.72	08/12/1962
1963	67.57	1.01	14.40	21/11/1963
1964	68.19	1.63	27.59	13/12/1964
1965	68.62	2.06	38.40	19/11/1965
1966	67.96	1.40	22.35	28/02/1967
1967	67.84	1.28	19.78	19/08/1968
1968	68.53	1.97	36.03	26/12/1968
1969	67.93	1.37	21.70	25/04/1970
1970	67.69	1.13	16.72	04/11/1970
1971	68.05	1.49	24.36	05/07/1972
1972	67.67	1.11	16.23	13/11/1972
1973	68.12	1.56	23.68	08/09/1974
1974	68.21	1.65	25.73	28/09/1974
1975	68.32	1.76	28.30	03/10/1975
1976	67.81	1.25	17.11	22/02/1977
1977	67.8	1.24	16.92	31/10/1977
1978	68.17	1.61	27.12	28/12/1978
1979	68.06	1.50	24.47	19/03/1980
1980	68.11	1.55	25.73	23/10/1980
1981	67.92	1.41	22.57	15/12/1981
1982	68.01	1.50	24.58	01/02/1983
1983	68.01	1.50	24.58	10/12/1983
1984	67.88	1.37	21.59	15/12/1984
1985	67.72	1.21	18.33	26/08/1986
1986	67.75	1.24	18.94	19/01/1987
1987	67.96	1.45	23.46	22/10/1987
1988	67.54	1.03	14.78	23/09/1989
1989	68.31	1.80	31.71	08/02/1990
1990	67.53	1.02	14.59	13/04/1991
1991	67.62	1.11	16.23	13/09/1992
1992	68.16	1.65	27.95	13/06/1993
1993	67.85	1.34	21.05	09/12/1993
1994	68.24	1.73	29.87	29/01/1995
1995	67.53	1.02	14.59	13/03/1996
1996	67.46	0.95	13.20	01/09/1997
1997	67.58	1.07	15.55	09/01/1998
1998	67.57	1.06	15.35	06/01/1999
1999	67.51	1.00	14.22	13/01/2000
2000	67.97	1.46	23.68	08/11/2000

Consent of competent owner required for any other use.

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Hydrometric years run from the 1st October to 30th September, e.g., hydrometric year 1980 begins on 1st October 1980.

Current Staff Gauge Zero = 66.51 mAOD (Poolbeg)

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APPENDIX 2.5.2
Water Quality Data for River Figle (EPA Source)

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Station No: 0050

River Code: 14F01

Situated On: FIGILE

Location: Br S of Ticknevin Bridge

Hydrometric Area: Barrow

Chemical Data Available For:

1998 to 2000

Biological Data:



YEAR	QUALITY
2000	1-2
1997	1/0
1994	1
1993	2
1990	1-2
1989	2

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Station No: 0300

River Code: 14F01

Situated On: FIGILE

Location: Bridge in Clonbulloge

Hydrometric Area: Barrow

Chemical Data Available For:

1995 to 1997

Biological Data:



YEAR	QUALITY
2000	4-5
1997	3-4
1989	4
1986	4
1979	4
1976	4
1975	3-4

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Station No: 0050 Location: Br S of Ticknevin Bridge Date From: 1998 To: 2000

A value displayed in **BOLD** indicates the value falls outside either an upper or lower threshold and highlights stations where there may be water quality problems.

Parameter	Parameter Units	Minimum	Median	Maximum	No of Samples	Source	Source Type
Dissolved Oxygen	mg/l O ²	6.8	8.8	10.0	5	Kildare Co Co	LA
Dissolved Oxygen	% Saturation	63	73	94	5	Kildare Co Co	LA
Ortho-Phosphate	mg/l P	0.05	0.16	0.43	9	Kildare Co Co	LA
Temperature	°C	5.8	7.4	12.2	5	Kildare Co Co	LA

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Station No: 0100

River Code: 14F01

Situated On: FIGILE

Location: Cushaling Bridge

Hydrometric Area: Barrow

Chemical Data Available For:

1998 to 2000

Biological Data:

YEAR	QUALITY
2000	3
1997	2
1993	3-4
1989	3-4
1986	3-4

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Station No: 0100 **Location:** Cushaling Bridge **Date From:** 1998 **To:** 2000

A value displayed in **BOLD** indicates the value falls outside either an upper or lower threshold and highlights stations where there may be water quality problems.

Parameter	Parameter Units	Minimum	Median	Maximum	No of Samples	Source	Source Type
Dissolved Oxygen	mg/l O ²	7.8	9.6	10.2	5	Kildare Co Co	LA
Dissolved Oxygen	% Saturation	71	80	93	5	Kildare Co Co	LA
Ortho-Phosphate	mg/l P	0.03	0.05	0.08	9	Kildare Co Co	LA
Temperature	°C	5.7	7.2	14.2	5	Kildare Co Co	LA

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Station No: 0200

River Code: 14F01

Situated On: FIGILE

Location: Kilcumber Bridge

Hydrometric Area: Barrow

Chemical Data Available For:

1995 to 1997

Biological Data:



YEAR	QUALITY
2000	3-4
1997	3
1993	3-4
1989	3
1986	3-4

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Station No: 0200 Location: Kilcumber Bridge Date From: 1995 To: 1997

A value displayed in **BOLD** indicates the value falls outside either an upper or lower threshold and highlights stations where there may be water quality problems.

Parameter	Parameter Units	Minimum	Median	Maximum	No of Samples	Source	Source Type
B.O.D	mg/l O ²	2.1	2.3	2.5	6	Offaly Co Co	LA
Dissolved Oxygen	mg/l O ²	6.9	7.8	9.7	6	Offaly Co Co	LA
Dissolved Oxygen	% Saturation	73	80	96	6	Offaly Co Co	LA
Oxidised Nitrogen	mg/l N	0.1	0.7	1.3	4	Offaly Co Co	LA
pH	pH	7.7	8.1	8.2	6	Offaly Co Co	LA
Temperature	°C	11.0	16.0	22.0	6	Offaly Co Co	LA
Total Ammonia	mg/l N	0.18	0.22	0.31	6	Offaly Co Co	LA
Un-Ionised Ammonia	mg/l NH ³	0.004	0.010	0.013	6	Offaly Co Co	LA

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Station No: 0300 Location: Bridge in Clonbulloge Date From: 1995 To: 1997

A value displayed in **BOLD** indicates the value falls outside either an upper or lower threshold and highlights stations where there may be water quality problems.

Parameter	Parameter Units	Minimum	Median	Maximum	No of Samples	Source	Source Type
B.O.D	mg/l O ²	1.8	2.5	5.1	6	Offaly Co Co	LA
Dissolved Oxygen	mg/l O ²	8.0	8.4	9.8	6	Offaly Co Co	LA
Dissolved Oxygen	% Saturation	82	84	97	6	Offaly Co Co	LA
Oxidised Nitrogen	mg/l N	0.1	0.5	1.0	4	Offaly Co Co	LA
pH	pH	7.8	8.1	8.2	6	Offaly Co Co	LA
Temperature	°C	11.0	16.0	22.0	6	Offaly Co Co	LA
Total Ammonia	mg/l N	0.32	0.39	0.52	6	Offaly Co Co	LA
Un-Ionised Ammonia	mg/l NH ³	0.007	0.015	0.034	6	Offaly Co Co	LA

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