

ATTACHMENT No F.1

DISCHARGE MODELLING & IMPACT ON ENVIRONMENT

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**COURTMACSHERRY, TIMOLEAGUE
& KILBRITTAIN SEWERAGE SCHEMES**

MARINE SURVEY

REPORT

DRAFT

Prepared for:

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11^h October 2004

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INTRODUCTION

In July 2004 Irish Hydrodata Limited (IHD) were commissioned by Barry & Partners consulting engineers, to conduct marine studies in Courtmacsherry Harbour. The survey area was to extend eastwards to the Argideen River and westwards to Coolmain Bay. The studies sought to provide detailed information on the marine environment which would assist with the production of a hydrodynamic model for the area.

The study methodology was agreed between IHD and Barry & Partners following discussion with modelling consultants, Hydro Environmental Ltd. The various aspects of the study were to include bathymetry, current measurements and the continuous measurement of wind and tidal level data. Water samples were also to be taken and analysed for various parameters. Drogue and dye tracking exercises were conducted to establish tidal excursions and flow patterns at various stages of the tide.

This report documents specific aspects of the study individually in Sections 1-7. Relevant figures and plots are included at the rear of the report in Annexes 1-7.

All survey position data is to Irish National Grid and vertical control is to Chart Datum. Times where shown, refer to local time (BST).

1. BATHYMETRIC SURVEY

A bathymetric survey of the area was conducted at 300m line spacing with smaller line spacing to delineate the Argideen River channel. An area to the south of Wood Point was surveyed in more detail (50m line spacing). The survey was completed from a 7m long shallow draft launch equipped with a Knudsen 320m dual frequency echosounder and a Trimble NT300D positioning system. Data was logged on a computer running HYPACK survey software.

Tidal levels were recorded manually at the 'new' pier in Courtmacsherry and the bathymetric data was subsequently reduced to Chart Datum

The data is presented in Drawing Nos. 940_1_04, 940_2_04 and 940_3_04 and are contained in Annex 1 at the rear of this report.

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2. TIDAL LEVEL RECORDING

A digital tide gauge was deployed at the pier in Courtmacsherry. This was a seabed mounted Coastal Leasing Inc. Minitide unit which recorded absolute pressure (i.e. due to atmosphere and head of water) data at 10-minute intervals. Data from the Met Eireann station at Cork Airport was used to correct for atmospheric pressure variations at the end of the deployment period. The gauge was levelled into Chart Datum.

A time series plots is presented in Annex 2, at the rear of this report.

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3. METEOROLOGICAL DATA

Mean hourly wind speed and direction information along with Mean Sea Level pressure data was sourced from the Met Eireann weather station at Cork Airport.

Time series plots for all data sets are presented in Annex 3.

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4. CURRENT METERING

An S4 recording current meter was deployed at the locations shown in Annex 4. The unit was attached to a buoy which was anchored to the seabed. The current meter was located at 1m below the water surface.

Currents were recorded at 10 minute intervals.

Time series plots of the data recorded over the deployment periods are also shown in Annex 4.

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5. WATER SAMPLING

Water samples were taken at 8No. locations within the survey area. The locations are shown in Annex 5. The results of the analysis are also presented in the Annex.

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6. DROGUE TRACKING

Drogue tracking exercises were conducted on four dates. Drogues were released from 2No. locations. One location was in the channel about 150m to the North of Ferry Point and the second was located at about 250m southeast of Wood Point in Coolmain Bay. Drogues were released at around high or low water and tracked for the subsequent flood or ebb excursion. Drogues had a submerged sail with dimensions of 1.5m x 1m (vertical) and were cruciform in shape with the sail set at either the surface or at 2m or 3m below the surface.

Tracking was accomplished by the survey vessel approaching the drogue at intervals and recording its position.

Drogue trajectories are shown Annex 6.

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7. DYE TRACKING

A dye tracking exercise was conducted on one dates. A small quantity of Rhodamine WT (50-100ml) tracer dye was released on the sea surface at differing stages of the tide. The dye was premixed with 1 litre of water to promote rapid initial mixing. The expanding patch was then tracked by the survey vessel until it moved away from the survey area or was diluted to low levels.

Tracking was accomplished visually for a period of time after release and then, when dye concentrations had fallen to a sufficiently low level, continued with a Turners Designs fluorometer. Water was pumped through the fluorometer and dye concentrations recorded continuously on an attached chart recorder as the survey vessel traversed the patch.

Patch trajectories are shown in Annex 7.

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ANNEX 1

BATHYMETRY

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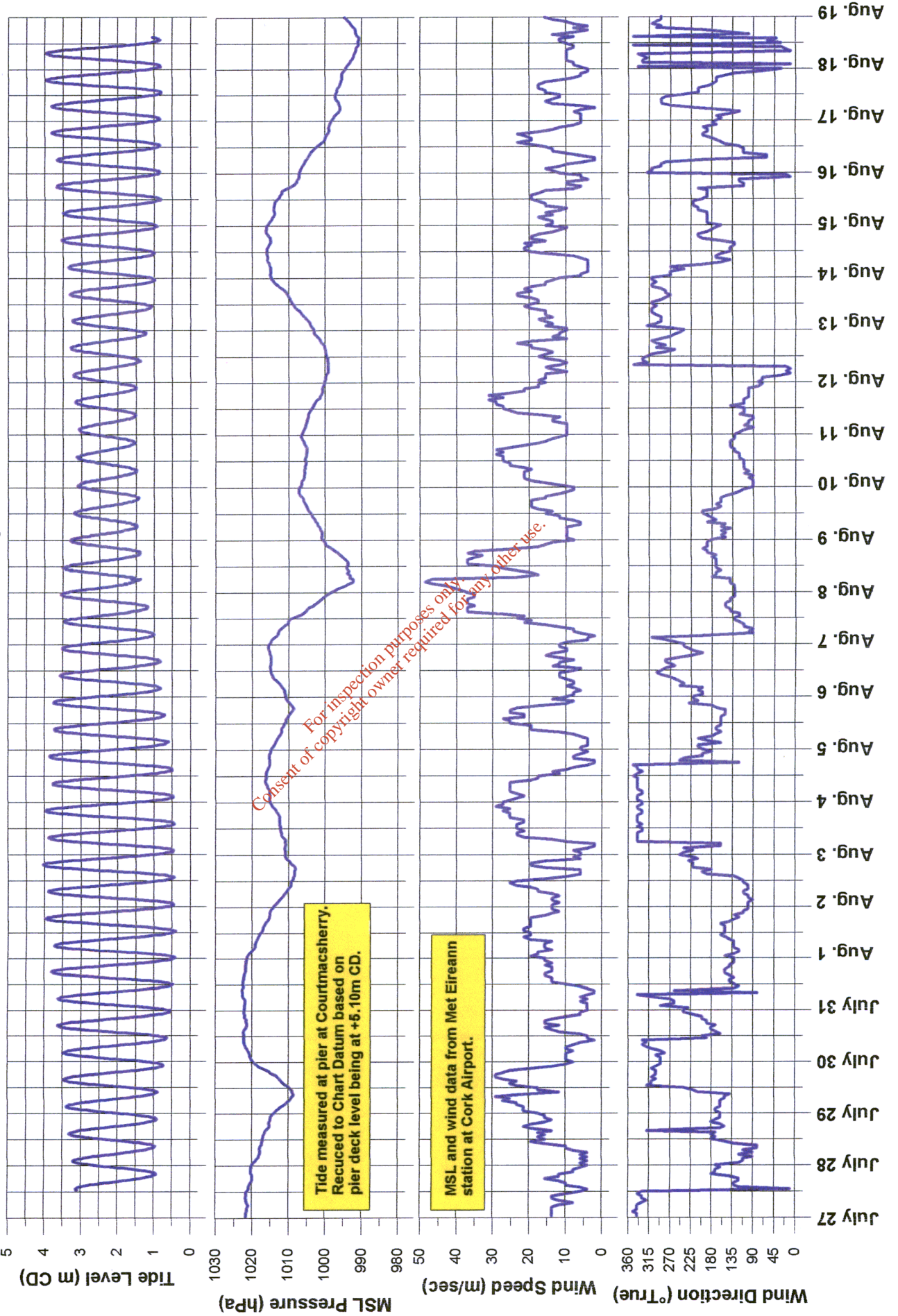
ANNEX 2

TIDAL LEVELS

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COURTMACSHERRY SEWERAGE SCHEME - MARINE SURVEY

Tide, Mean Sea Level Pressure, Wind Speed and Direction



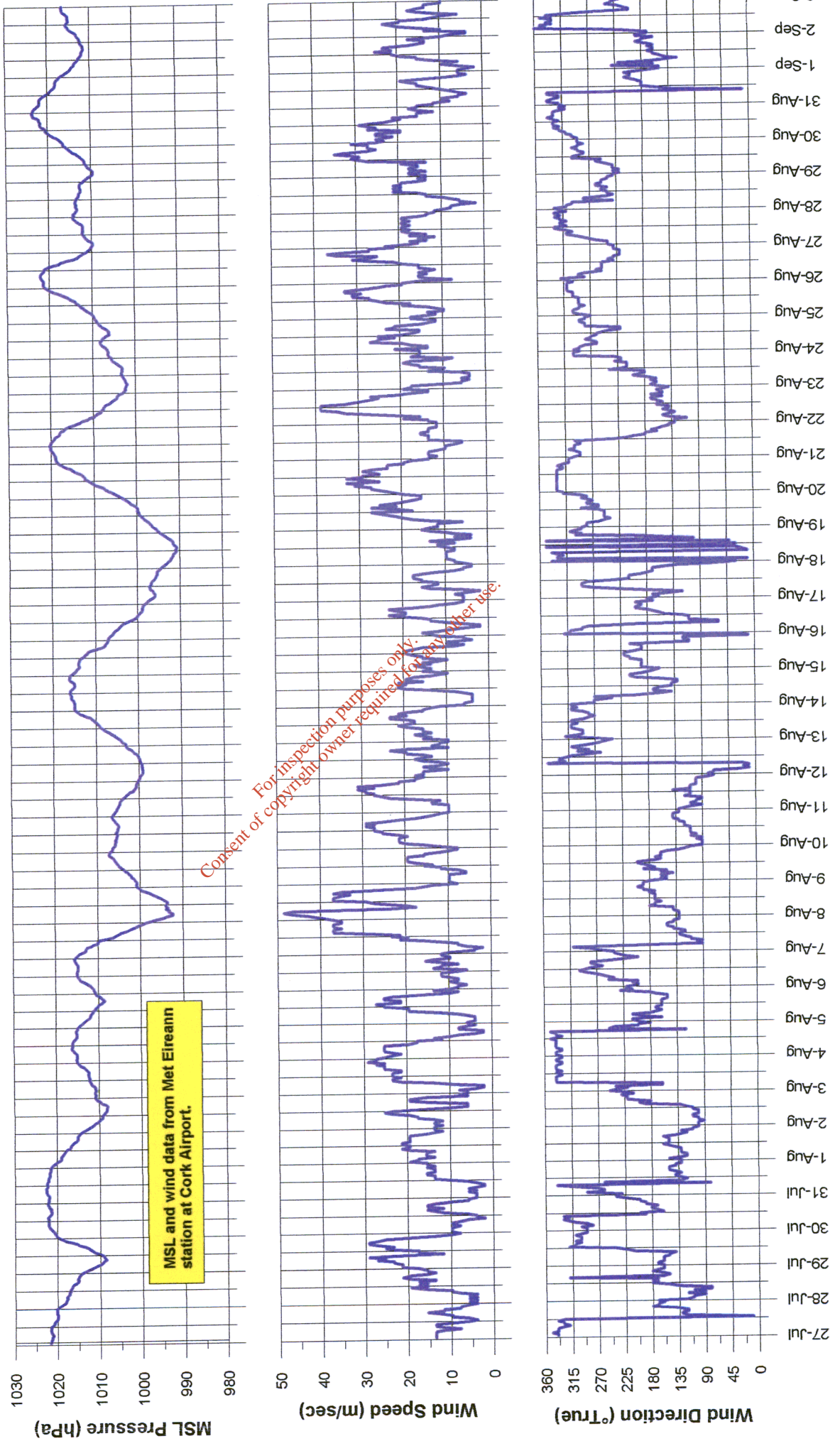
ANNEX 3

METEOROLOGICAL DATA

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COURTMACHERRY SEWERAGE SCHEME - MARINE SURVEY

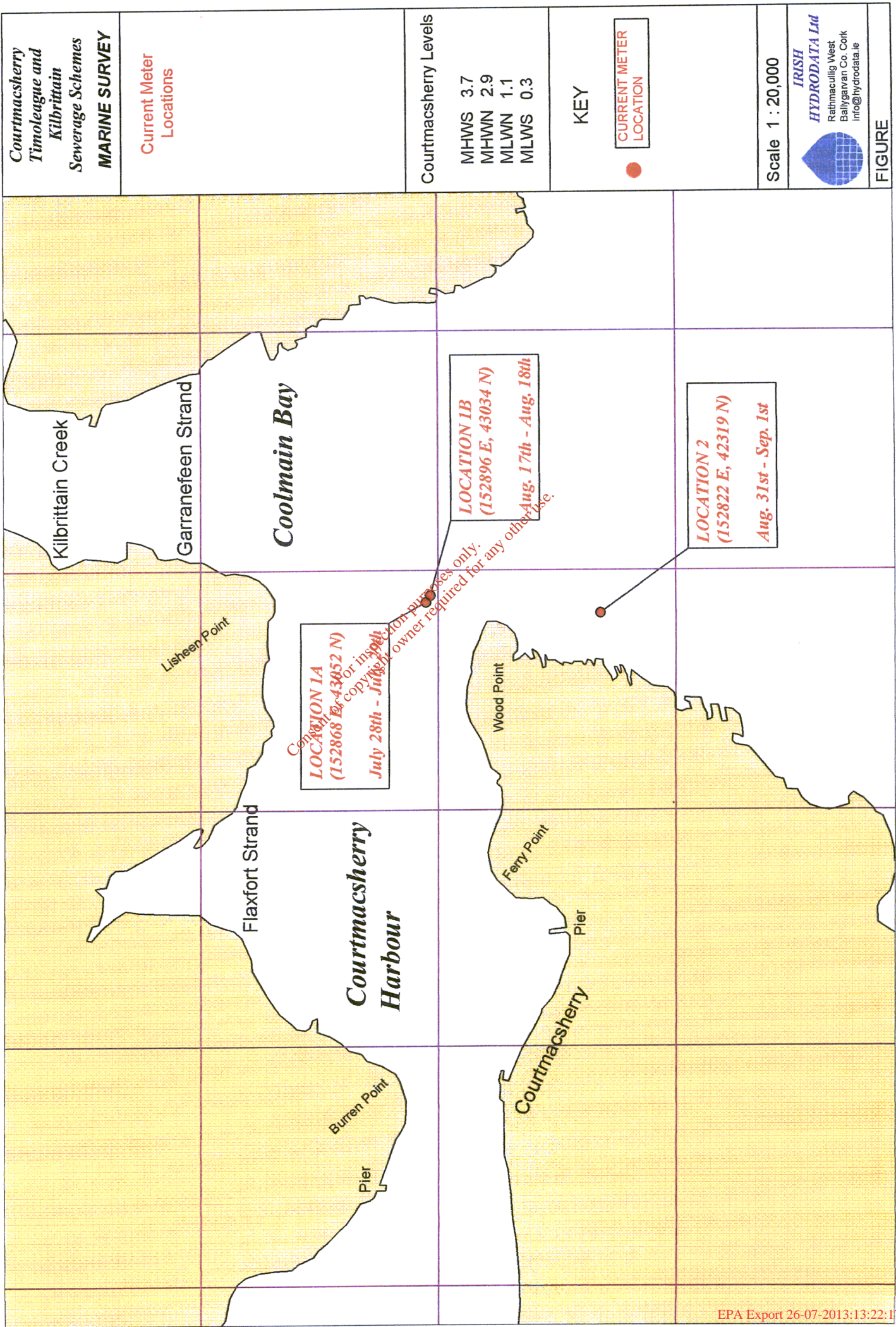
Mean Sea Level Pressure, Wind Speed and Direction at Cork Airport July 27th to September 2nd 2004



ANNEX 4

CURRENT DATA

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Courtmacsherry
Timoleague and
Kilbrittain
Sewerage Schemes
MARINE SURVEY

**Current Meter
Locations**

Courtmacsherry Levels

MHWS 3.7
MHWN 2.9
MLWN 1.1
MLWS 0.3

KEY

CURRENT METER
LOCATION

Scale 1 : 20,000

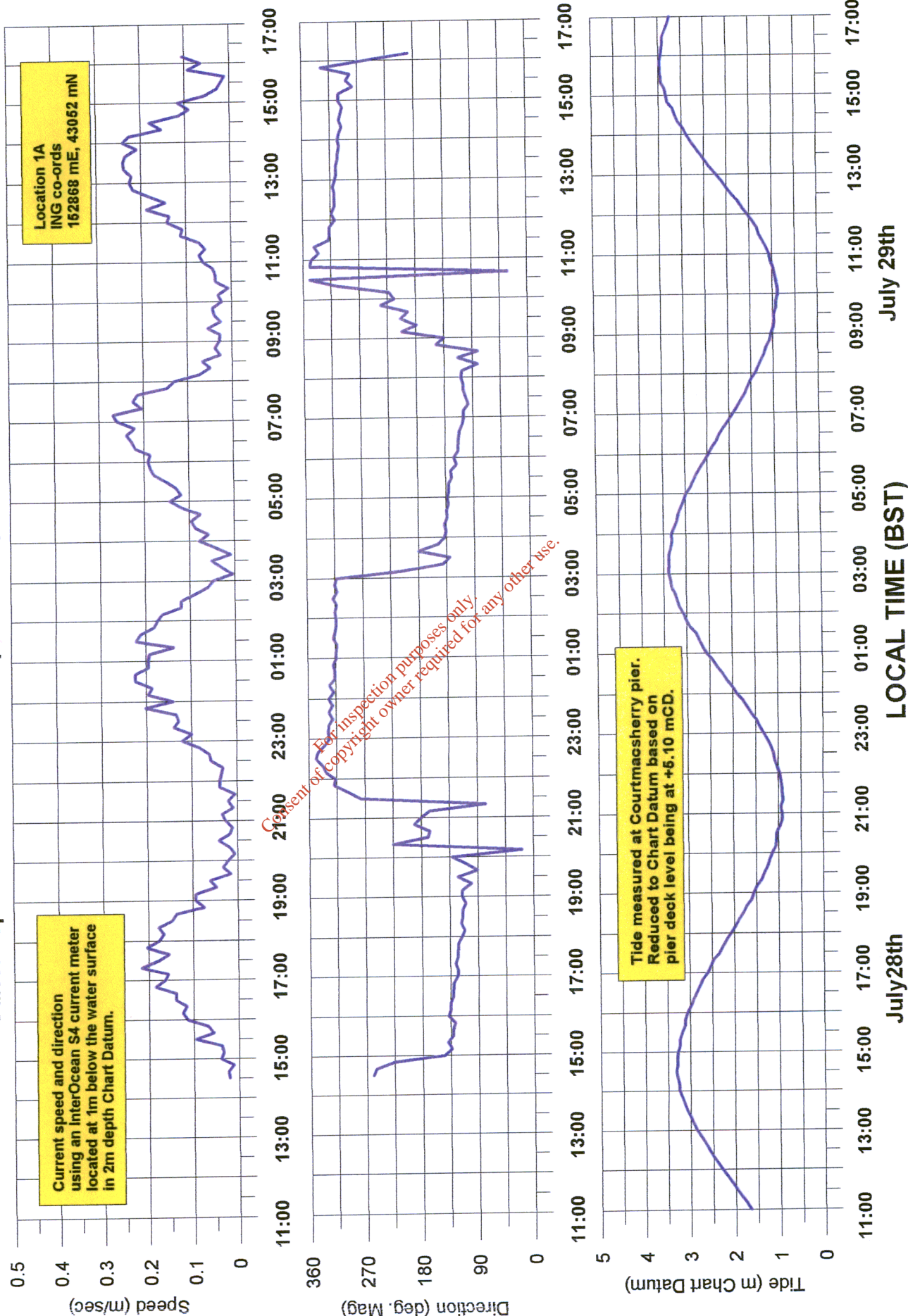
**IRISH
HYDRODATA Ltd**
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FIGURE

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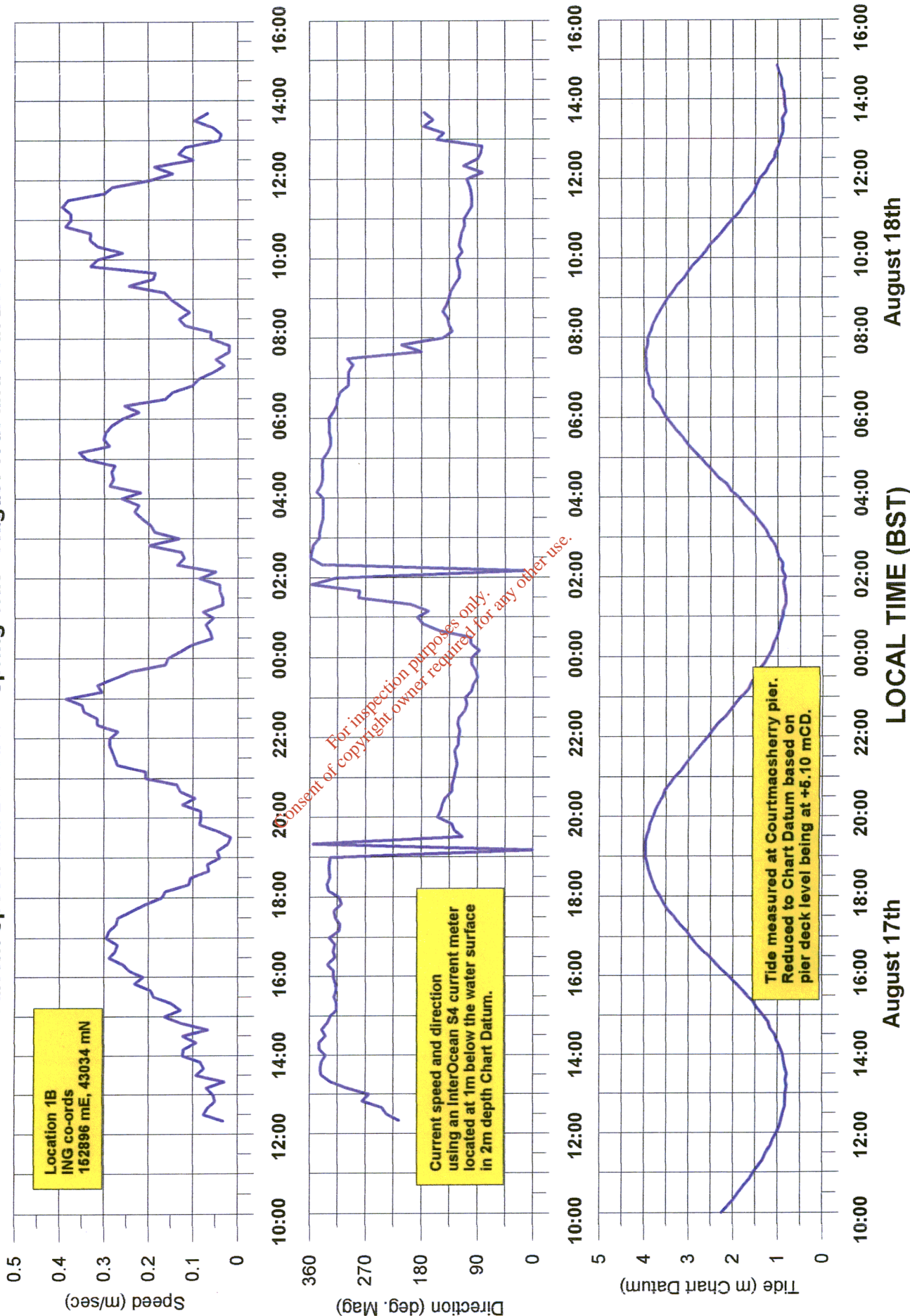
COURTMACSHERRY SEWERAGE SCHEME - MARINE SURVEY

Current Speed and Direction - Neap Tide - July 28th and 29th 2004



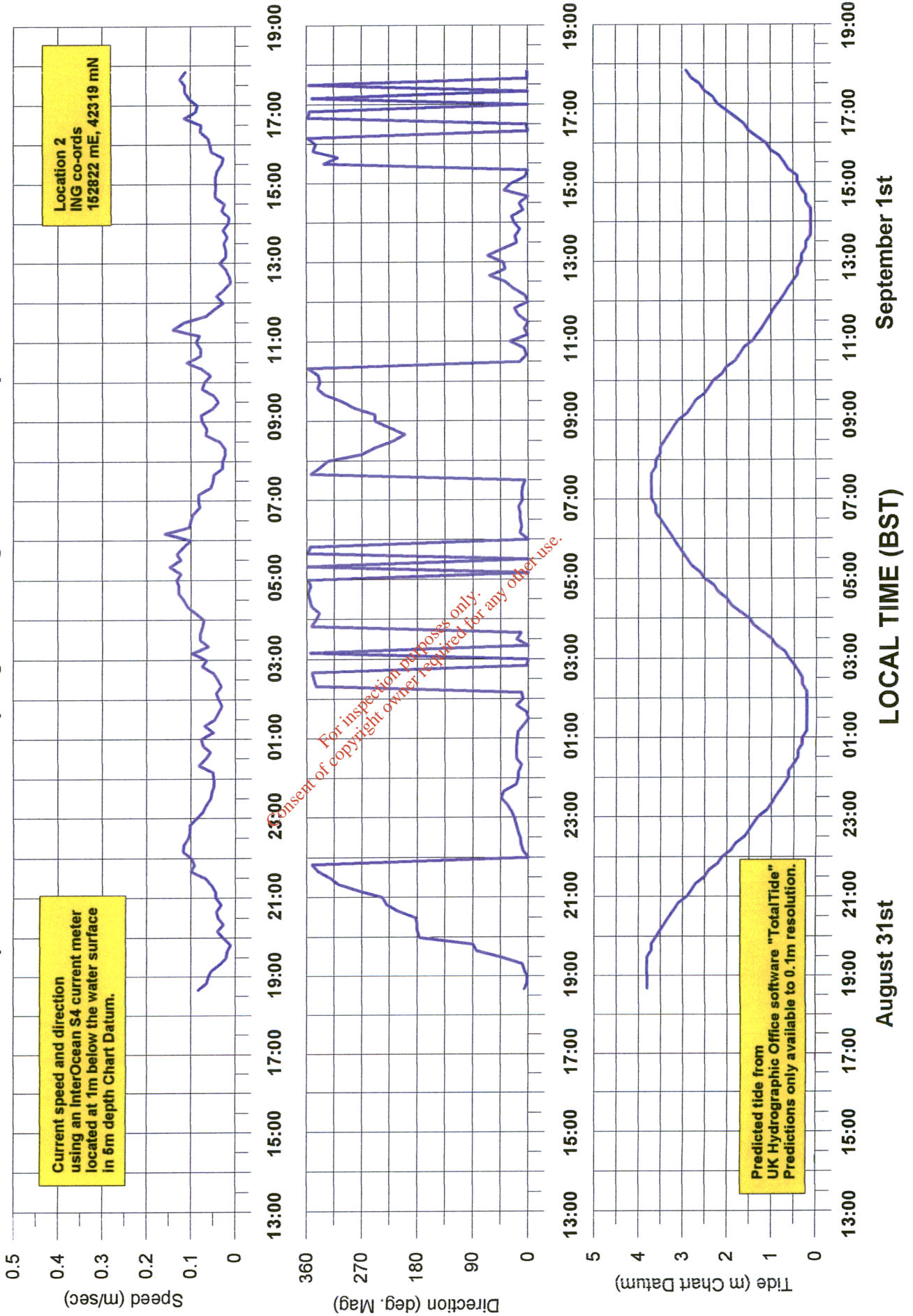
COURTMACSHERRY SEWERAGE SCHEME - MARINE SURVEY

Current Speed and Direction - Spring Tide - August 17th and 18th 2004



COURTMACHERRY SEWERAGE SCHEME - MARINE SURVEY

Current Speed and Direction - Spring Tide - August 31st and September 1st 2004



ANNEX 5

WATER SAMPLING

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*Courtmacsherry
Timoleague and
Kilbrittain
Sewerage Schemes*
MARINE SURVEY

Water Samples
on August 5th 2004

Courtmacsherry Tide
on August 5th 2004

BST	CD (m)
03:37	0.4
09:14	3.5
16:00	0.3
21:37	3.5

Courtmacsherry Levels

MHWS	3.7
MHWN	2.9
MLWN	1.1
MLWS	0.3

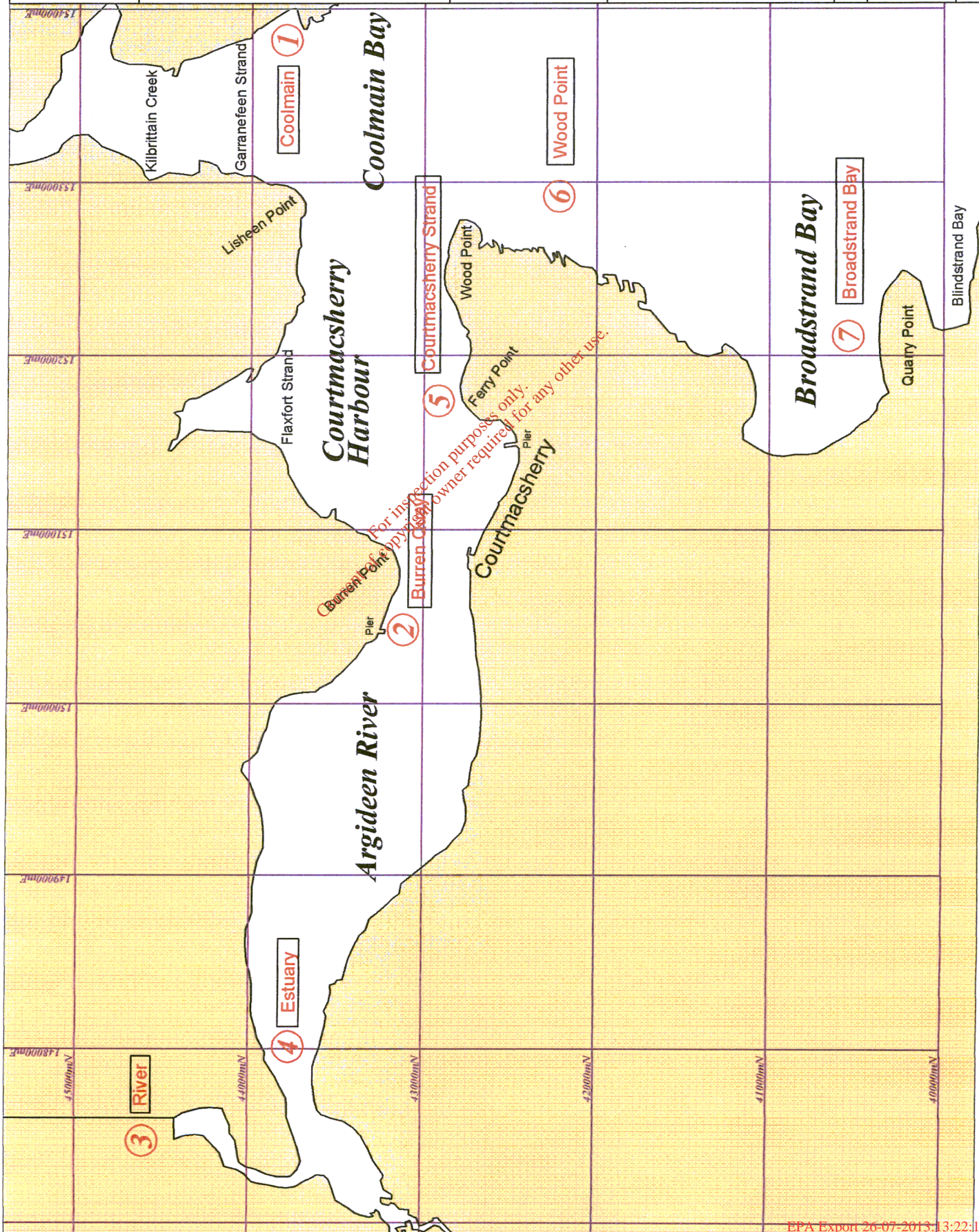
KEY

② WATER SAMPLING LOCATION NAME

Scale 1 : 30,000

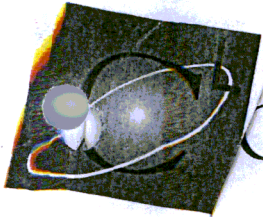
**IRISH
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FIGURE



Sample	pH	BOD (mg O ₂ /l)	SS (mg/l)	Salinity (ppt)	Ammonia (mg N/l)	Ortho-phosphate (mg P/l)	Total phosphorus (mg P/l)	Nitrite (mg N/l)	Nitrate (mg N/l)
1				34.2	0.035				0.051
2				33.9	0.040				0.055
3				22.4	0.026				0.980
4	7.98	4.0	236.0	29.5	0.038	0.017	0.290	0.008	0.277
5	8.22	1.3	19.3	34.1	0.041	0.004	0.031	0.000	0.067
6	8.14	1.6	8.2	33.9	0.039	0.004	0.023	0.001	0.041
7				33.6	0.037				0.056
COURTMACHERRY WATER SAMPLES - AUGUST 5th 2004									

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7025
 B
 REDITED
 STING
 REG N
 NO 07

Client ID : IHYD
 MR JIM WALSH
 IRISH HYDRODATE LTD
 BALLYGARVAN
 CO. CORK

Report No : 6595J
Date of Receipt : 05/08/04
Delivery Mode : Hand
Date testing Initiated : 05/08/04
Date of Report : 09/08/04
Sample Condn. on Receipt : Satisfactory

No. of Samples : 7
Sample Type : Water
Order Number :

Page : 1 of 2

TEST REPORT

Sample No : 6595J1
Client Reference : COOLMAIN 5/8/04

Test Description
 TOTAL COLIFORM COUNT- Colilert
 E.COLI COUNT - Colilert

Test Result	Unit	Method
184	MPN/100mls	MT C121
31	MPN/100mls	MT C121

Sample No : 6595J2
Client Reference : BURREN QUAY 5/8/04

Test Description
 TOTAL COLIFORM COUNT- Colilert
 E.COLI COUNT - Colilert

Test Result	Unit	Method
816	MPN/100mls	MT C121
250	MPN/100mls	MT C121

Sample No : 6595J3
Client Reference : TIMOLEAGUE RIVER 5/8/04

Test Description
 TOTAL COLIFORM COUNT- Colilert
 E.COLI COUNT - Colilert

Test Result	Unit	Method
840	MPN/100mls	MT C121
284	MPN/100mls	MT C121

Sample No : 6595J4
Client Reference : TIMOLEAGUE ESTUARY 5/8/04

Test Description
 TOTAL COLIFORM COUNT- Colilert
 E.COLI COUNT - Colilert

Test Result	Unit	Method
630	MPN/100mls	MT C121
378	MPN/100mls	MT C121

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