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DEVON AREA INTERNAL REPORT

MEASUREMENT OF DISSOLVED OXYGEN LEVELS IN THE DART ESTUARY.

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MEASUREMENT OF DISSOLVED OXYGEN LEVELS IN THE DART ESTUARY

1. INTRODUCTION

Under the EC Urban Waste Water Treatment Directive (UWWTD), the Dart Estuary has a qualifying discharge from Totnes STW and has been identified as possibly being "sensitive" ie. suffering or about to suffer from the effects of eutrophication.

By 1997, this region must be able to demonstrate to the DOE whether the Dart estuary should be designated under the directive as "sensitive".

2. TERMS OF REFERENCE

2.1 OBJECTIVES

A request was received from Senior Scientist (monitoring) to supply data on Dissolved Oxygen and temperature levels in "bloom" and "non-bloom" (ie. winter) conditions in support of the above application to the DOE.

2.3 PROJECT TEAM

T Cronin (Project Leader)
W Loxton (Project Manager)
A Loxton (Project Technician, Author)

3. METHOD

The data was collected from two sites in the estuary using Hydrolab Recorders. The sites chosen were close to the routine monitoring sites, one site was at Totnes (upper estuary) and one was at Flat owers (lower estuary). The sites are shown on figures 1 and 2.

The recorders were calibrated in the laboratory prior to deployment and validated weekly using single parameter WTW meters.

In addition to the continuous monitoring of temperature and D.O. values requested, pH, conductivity and salinity values were also recorded.

4. RESULTS

4.2 INVESTIGATION RESULTS

This report is concerned with the data collected during "non-bloom" conditions from 12/01/96 to 09/02/96.

ENVIRONMENT AGENCY



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The data collected has been put into two Lotus 123 spreadsheets. An example of the data format can be seen in Appendix I. The complete data files can be found on a disc labelled "DART - UWWTD 12/01/96 TO 09/02/96", located in the Devon Area Investigations Archive.

The validation readings can be seen in Appendix II.

5. DISCUSSION

All the data collected has been sent to Senior Scientist (monitoring) for analysis.

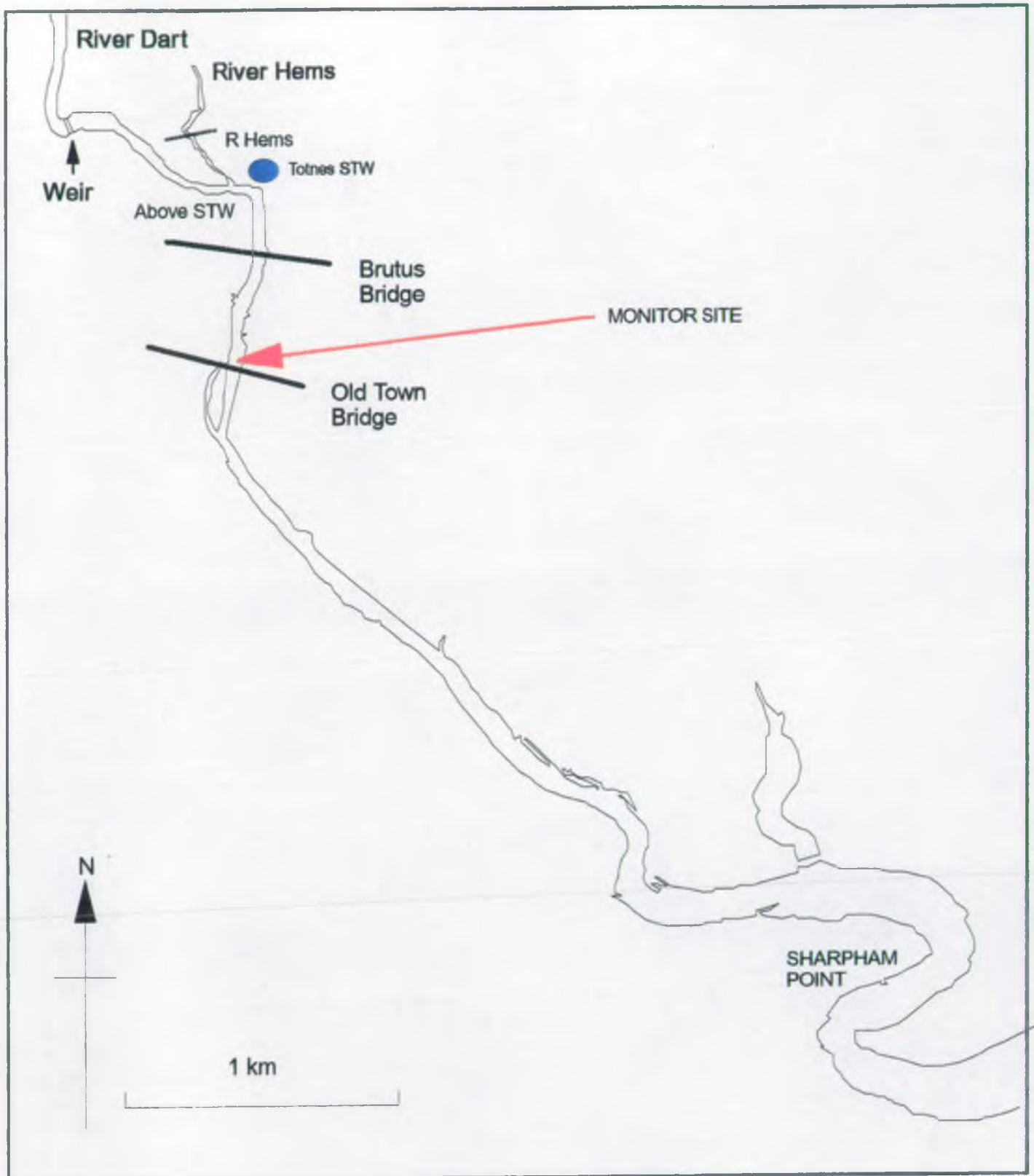


Figure 1. Upper Dart Estuary monitor site

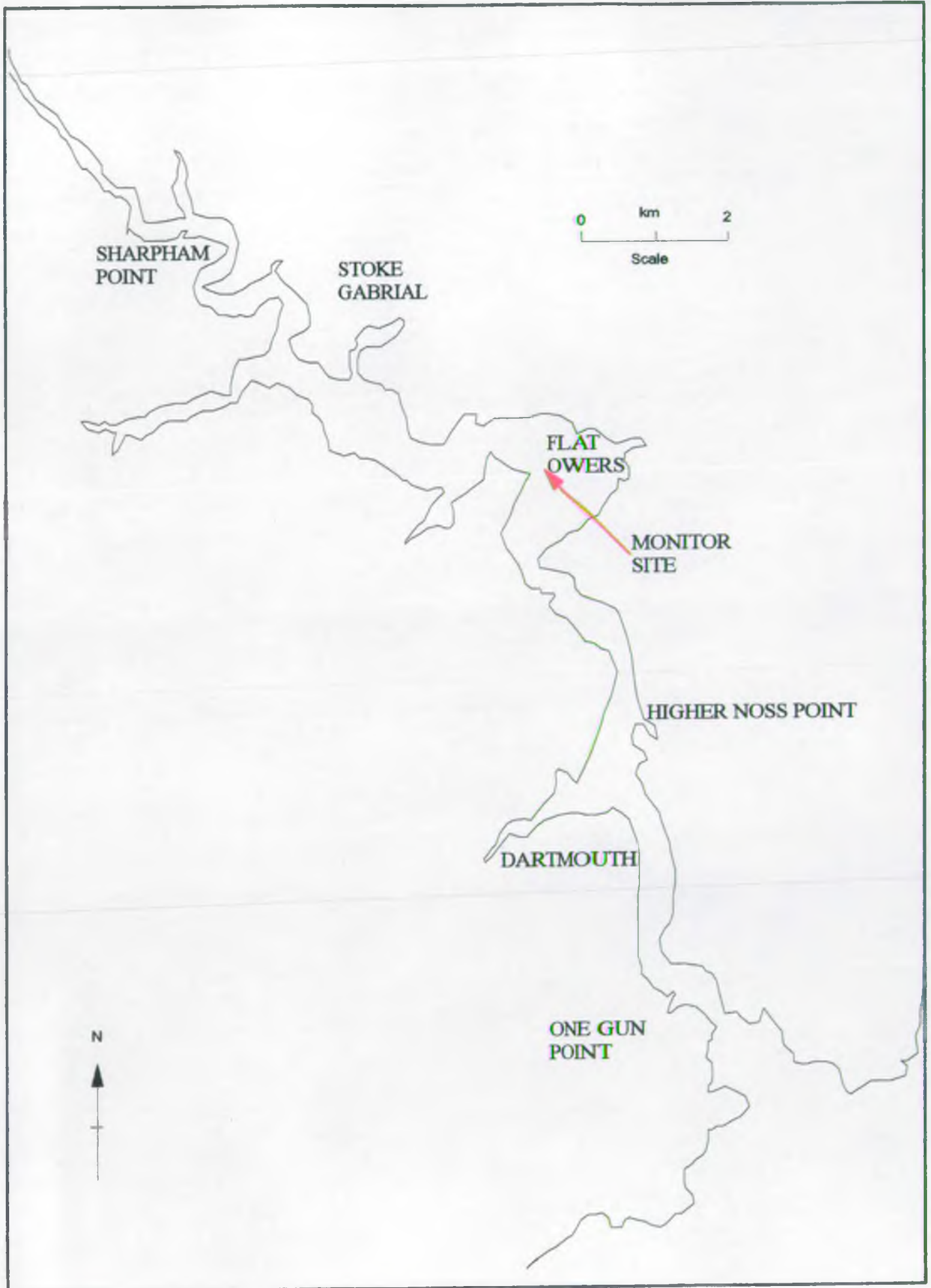
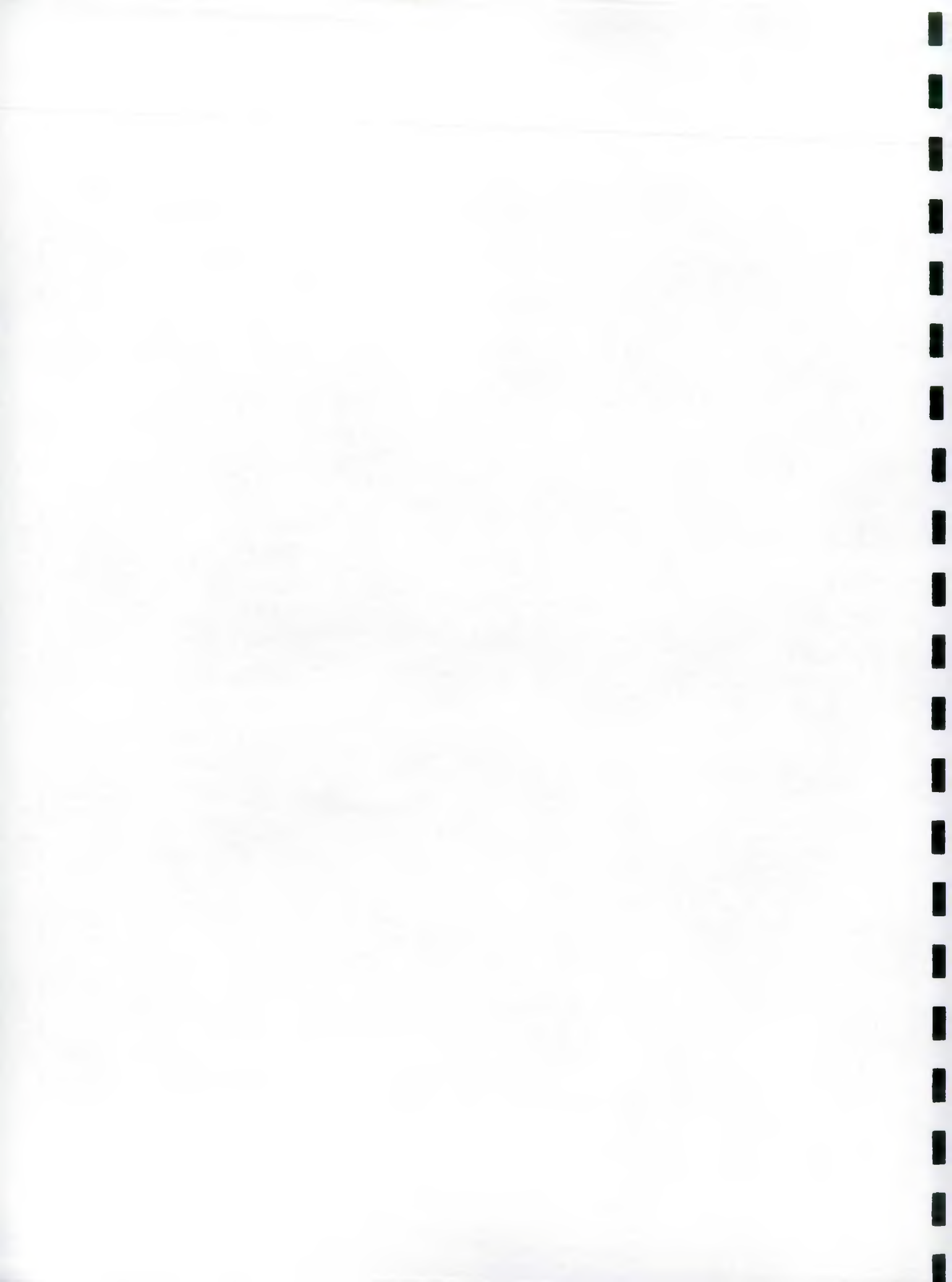


Figure 2: Lower Dart estuary monitor site



APPENDIX I

UWWTD
 SITE - RIVER DART (TOTNES - BETWEEN BRIDGES) - 12/01/96 to 09/02/96
 HYDROLAB RECORDER DATA

Date DDMMYY	Time HHMMSS	Temp degC	pH units	SpCond uS/cm	Salin ppt	DO %Sat	DO mg/l
120196	153000	9.28	7.99	163	0.1	102.9	11.80
120196	160000	9.30	7.97	157	0.1	103.0	11.82
120196	163000	9.30	7.97	160	0.1	103.3	11.85
120196	170000	9.31	7.96	159	0.1	103.2	11.83
120196	173000	9.30	7.93	158	0.1	103.1	11.83
120196	180000	9.26	7.93	155	0.1	103.0	11.83
120196	183000	9.28	7.93	154	0.1	103.1	11.83
120196	190000	9.25	7.95	154	0.1	103.1	11.84
120196	193000	9.27	7.94	153	0.1	102.8	11.80
120196	200000	9.26	7.93	155	0.1	103.3	11.85
120196	203000	9.26	7.94	152	0.1	103.1	11.84
120196	210000	9.27	7.93	151	0.1	103.3	11.86
120196	213000	9.28	7.93	151	0.1	103.1	11.82
120196	220000	9.26	7.93	144	0.1	103.0	11.83
120196	223000	9.29	7.94	152	0.1	102.9	11.81
120196	230000	9.30	7.94	158	0.1	102.9	11.80
120196	233000	9.31	7.94	160	0.1	102.9	11.80
130196	0	9.30	7.93	156	0.1	102.7	11.78
130196	3000	9.29	7.93	154	0.1	102.9	11.80
130196	10000	9.30	7.92	162	0.1	103.2	11.84
130196	13000	9.29	7.93	154	0.1	103.4	11.86
130196	20000	9.26	7.90	151	0.1	103.4	11.87
130196	23000	9.25	7.91	155	0.1	103.2	11.85
130196	30000	9.22	7.90	150	0.1	103.4	11.88
130196	33000	9.23	7.90	149	0.1	103.3	11.86
130196	40000	9.22	7.88	155	0.1	103.7	11.91
130196	43000	9.19	7.86	154	0.1	103.4	11.88
130196	50000	9.19	7.83	159	0.1	103.6	11.91
130196	53000	9.16	7.83	159	0.1	103.8	11.94
130196	60000	9.14	7.83	153	0.1	103.6	11.92
130196	63000	9.12	7.86	155	0.1	103.9	11.97
130196	70000	9.10	7.86	153	0.1	103.5	11.93
130196	73000	9.08	7.87	155	0.1	103.5	11.94
130196	80000	9.06	7.87	155	0.1	103.8	11.97
130196	83000	9.05	7.85	153	0.1	103.7	11.97
130196	90000	9.02	7.82	149	0.1	104.0	12.01
130196	93000	9.01	7.83	151	0.1	103.7	11.97
130196	100000	8.97	7.82	143	0.1	103.8	12.00
130196	103000	8.99	7.84	148	0.1	103.7	11.98
130196	110000	9.00	7.89	150	0.1	104.1	12.02
130196	113000	9.01	7.93	159	0.1	104.3	12.04
130196	120000	9.04	7.95	166	0.1	104.1	12.01
130196	123000	9.07	8.02	167	0.1	104.1	12.01
130196	130000	9.12	8.01	170	0.1	104.2	12.00
130196	133000	9.15	7.99	168	0.1	104.3	12.01
130196	140000	9.17	7.98	163	0.1	105.0	12.08
130196	143000	9.22	7.99	168	0.1	104.7	12.03
130196	150000	9.25	7.96	167	0.1	104.5	12.00
130196	153000	9.26	7.96	169	0.1	104.9	12.04
130196	160000	9.27	7.94	174	0.1	104.7	12.02
130196	163000	9.27	7.95	166	0.1	104.4	11.98
130196	170000	9.28	7.94	168	0.1	104.6	12.00
130196	173000	9.27	7.94	166	0.1	104.5	11.99
130196	180000	9.27	7.93	171	0.1	104.5	11.99
130196	183000	9.29	7.93	176	0.1	104.0	11.93
130196	190000	9.30	7.95	171	0.1	104.2	11.95
130196	193000	9.33	7.94	175	0.1	103.9	11.91

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SITE - RIVER DART (FLAT OWERS) - 12/01/96 to 09/02/96

HYDROLAB RECORDER DATA

Date	Time	Temp	pH	SpCond	Salin	DO	DO
DDMMYY	HHMMSS	degC	units	uS/cm	ppt	%Sat	mg/l
120196	130000	9.37	8.07	27286	16.9	100.9	10.36
120196	133000	9.39	8.08	27160	16.8	101.2	10.39
120196	140000	9.42	8.07	27214	16.9	101.1	10.37
120196	143000	9.39	8.07	24744	15.2	101.6	10.54
120196	150000	9.34	8.07	24489	15.0	100.4	10.43
120196	153000	9.28	8.06	21896	13.3	100.6	10.59
120196	160000	9.24	8.04	19358	11.6	100.4	10.69
120196	163000	9.21	8.01	16949	10.1	100.2	10.78
120196	170000	9.20	7.99	15386	9.1	100.6	10.90
120196	173000	9.28	8.05	21245	12.9	100.3	10.58
120196	180000	9.38	8.06	26250	16.2	100.9	10.41
120196	183000	9.32	8.05	22016	13.4	100.8	10.59
120196	190000	9.29	8.04	21243	12.9	100.6	10.61
120196	193000	9.36	8.07	24754	15.2	100.7	10.45
120196	200000	9.47	8.08	29363	18.3	100.9	10.24
120196	203000	9.40	8.08	25523	15.7	101.2	10.46
120196	210000	9.44	8.08	27284	16.9	101.0	10.36
120196	213000	9.37	8.06	22662	13.8	101.3	10.60
120196	220000	9.42	8.08	26895	16.6	101.1	10.38
120196	223000	9.42	8.07	23569	14.4	101.1	10.53
120196	230000	9.42	8.07	22793	13.9	101.1	10.56
120196	233000	9.41	8.07	23315	14.3	101.2	10.55
130196	0	9.37	8.06	22011	13.4	100.9	10.59
130196	3000	9.36	8.06	21823	13.3	101.0	10.61
130196	10000	9.36	8.05	22013	13.4	101.4	10.64
130196	13000	9.36	8.06	22409	13.6	101.4	10.63
130196	20000	9.34	8.05	21754	13.2	101.1	10.63
130196	23000	9.34	8.05	22014	13.4	101.1	10.62
130196	30000	9.31	8.04	21632	13.1	101.2	10.66
130196	33000	9.40	8.07	22724	13.9	100.1	10.47
130196	40000	9.40	8.05	22073	13.4	100.1	10.49
130196	43000	9.31	8.03	17918	10.7	100.1	10.71
130196	50000	9.36	8.01	17454	10.4	99.9	10.69
130196	53000	9.39	8.02	20517	12.4	100.2	10.57
130196	60000	9.59	8.08	30975	19.4	100.8	10.13
130196	63000	9.47	8.08	26232	16.2	100.5	10.34
130196	70000	9.40	8.05	23375	14.3	100.1	10.44
130196	73000	9.41	8.06	23901	14.6	100.4	10.45
130196	80000	9.55	8.08	28499	17.7	100.2	10.19
130196	83000	9.63	8.08	31936	20.1	100.2	10.02
130196	90000	9.60	8.08	30639	19.2	100.3	10.10
130196	93000	9.59	8.08	31040	19.5	100.4	10.09
130196	100000	9.60	8.08	30517	19.1	100.3	10.11
130196	103000	9.57	8.09	30326	19.0	100.8	10.17
130196	110000	9.47	8.09	27338	16.9	100.5	10.29
130196	113000	9.57	8.09	30326	19.0	100.5	10.14
130196	120000	9.67	8.09	33956	21.5	100.8	9.99
130196	123000	9.52	8.08	27860	17.3	100.3	10.24
130196	130000	9.44	8.07	24810	15.2	100.7	10.43
130196	133000	9.44	8.06	21879	13.3	101.0	10.59
130196	140000	9.46	8.06	21552	13.1	100.6	10.56
130196	143000	9.49	8.05	21419	13.0	100.8	10.58
130196	150000	9.54	8.05	23952	14.7	101.0	10.47
130196	153000	9.59	8.08	26094	16.1	100.4	10.31
130196	160000	9.52	8.04	20499	12.4	100.7	10.60
130196	163000	9.54	8.03	18936	11.4	100.6	10.65
130196	170000	9.54	8.03	20177	12.2	100.6	10.60

APPENDIX II

HYDROLAB RECORDER CALIBRATION CHECKS

TABLE 1 - TOTNES (BETWEEN BRIDGES)
DEPLOYED FROM: 12/01/96 TO 09/02/96

DATE DD/MM/YR	TIME GMT HRS:MIN		TEMP		pH		D.O. %sat		SALINITY psu		COMMENTS
			HYDRO	WTW	HYDRO	WTW	HYDRO	WTW	HYDRO	WTW	
12/01/96	1500	CLEAN	8.99	9	8.07	7.57	101.6	99	0.1	0	
19/01/96	1500	DIRTY	9.41	9.5	8.06	7.84	101-1.3	99	0.1	0	
		CLEAN	9.4	9.5	8.05	7.89	102	99	0.1	0	
30/01/96	1300	DIRTY	4.78	4.8	8.14	7.86	100.9	100	0.1	0	
		CLEAN	4.9	5	8.34	8.02	99	100	0.1	0	
06/02/96	930	DIRTY	4.3	4.4	8.23	7.79	94	96	0.1	0	BOTH D.O. READ 101 AIR
		CLEAN	4.3	4.4	8.25	7.82	93.8	94.2	0.1	0	
09/02/96	900	DIRTY	5.8	5.6	8.2	7.86	97.2	99	0.1	0	

TABLE 2 - FLAT OWERS
DEPLOYED FROM: 19/01/96 TO 09/02/96

DATE DD/MM/YR	TIME GMT HRS:MIN		TEMP		pH		D.O. %sat		SALINITY psu		COMMENTS
			HYDRO	WTW	HYDRO	WTW	HYDRO	WTW	HYDRO	WTW	
12/01/96	1300	CLEAN	9.2	9.2	8.05	8.4	100	96	18	18	
19/01/96	1400	DIRTY	10.1	10.1	8.13	7.96	100	98	19.7	19.4	HYDRO READS 100.1 AIR
		CLEAN	10.2	10.1	8.14	7.98	100.1	98	26.8	26.6	
30/01/96	1400	DIRTY	5.02	5	8.22	7.96	90.2	91.2	16.4	15.8	
		CLEAN	6.9	7	8.2	7.96	90.3	91	16.4	15.8	
06/02/96	830	DIRTY	5.9	5.8	8.23	7.98	91	96	29	28.7	HYDRO READS 100 IN AIR
		CLEAN	6	6	8.23	7.98	92	96	30	31	
09/02/96	1230	DIRTY	6.2	6.3	8.23	7.96	88.6	91	26.1	27	