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DEVON AREA INTERNAL REPORT

**AN INVESTIGATION TO DETERMINE IF
DEEP MOOR LANDFILL SITE IS CAUSING
AN IMPACT DOWNSTREAM IN THE
PEAGHAM STREAM.**

**FEBBUARY 1996
DEV/E/09/96**

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AN INVESTIGATION TO DETERMINE IF DEEP MOOR LANDFILL SITE IS CAUSING AN IMPACT DOWNSTREAM IN THE PEAGHAM STREAM.

INTRODUCTION

The Peagham Stream rises south of Deep Moor at the Thornedown plantation (NGR SS 5290 2169). The stream flows south then west for approximately 5 km before its confluence with the River Torridge at Town Mills (NGR SS 5005 1831).

The Peagham Stream has a River Ecosystem Use (RE) Class target of 2. At present the river water is routinely chemically monitored at Town Mills (R29B050). Previous to 1996 there were three other routine chemical sites, Deep Moor Stream East (R29B019 at NGR SS 52202090), Deep Moor Stream North (R29B018 at NGR SS 52402090) and downstream at Leighty Water (R29B028 at NGR SS 52101980) (see Figure 1).

The Deep Moor landfill site has had problems historically which resulted in poor water quality in the stream. Discharges of leachate into the stream due to lagoons overflowing / collapsing during wet weather resulted in a general decrease in aquatic diversity and increase in sewage fungus downstream of the tip over the years.

During mid 1994 a new pre-treatment works and sewer line to Torrington Sewage Treatment Works were installed. It is hoped that the new scheme will reduce the likelihood of further inputs to the stream and result in a general increase in the water quality of Peagham Stream.

2. TERMS OF REFERENCE

2.1 OBJECTIVES

A request was received from the Water Quality Officer (WQO) for the area to investigate any impact the tip site at Deep Moor may be having on the downstream watercourse.

The aim of this investigation is to determine if Deep Moor landfill site is causing an impact on the Peagham stream during dry and wet weather regimes. This report is a documentation of the study.

2.3 PROJECT TEAM

T. Cronin (Project Leader)
P. Rose (Project Manager, author)

3. METHOD

1. Analysis of routine water quality data to establish any trends and / or relationships between water quality and other factors such as rainfall and drought.
2. Collection of water samples from the Deep Moor Landfill site area and downstream during dry and wet weather conditions.
3. Assess the Peagham stream at Leighty Water biologically during dry weather flows.

4. RESULTS

4.1 HISTORIC DATA

Analysis of routine water quality data from samples taken at Town Mills (R29B050) between the period of 01 January 1993 and 11 January 1996 and from Deep Moor Stream North (R29B018), Deep Moor Stream East (R29B019) and downstream at Leighty Water (R29B028) between the period of 01 January 1993 and 9 August 1995 (see APPENDIX I) show the following exceedances (using RE Class 2 EQS's, see APPENDIX II).

Site	Total no. of samples	Total Ammonia Exceedances	BOD exceedances	Associated with rainfall
R29B050	43	6	2	all
R29B018	22	4	4	not particularly
R29B019	22	13	7	not particularly
R29B028	25	4	6	not particularly

Total Ammonia EQS = 0.6 mg/l as 95 %-ile

BOD EQS = 4.0 mg/l as 95 %-ile

4.2 INVESTIGATION DATA

The investigation was split into two surveys. The first was carried out during a dry weather regime and included a chemical survey of the watercourse and a biological collection downstream of the landfill site at Leighty water (See APPENDIX III for results previously reported).

The second survey was carried out under wet weather conditions to assess the impact of run-off from the tip site; chemical samples were taken upstream of the tip, the tip area and downstream (see Figure 1 and Table 1).

5. DISCUSSION

The routine river water samples taken from the Town Mills site (R29B050) were not all taken on the same dates as those taken upstream making comparison / interpretations of the results difficult. The exceedances of the samples taken at the three sites upstream of Town Mills were probably due to leachate contamination (as identified during the dry weather survey) and surface run-off from the tip during wet weather..

The impact of Deep Moor landfill site on the general water quality of the Peagham Stream at Leighty Water downstream of the site was shown to be minimal during dry weather conditions (see APPENDIX III). However, two inputs into the stream on the tip site were identified, of which one appeared to be grossly contaminated with leachate, the other not so much.

On the day of the wet weather survey 11 January 1996, there was 14 mm of rain with 24.7 mm over the previous 4 days. Chemical impact was not detected at the Townmills or Leighty Water sites. However, there were marginal exceedances of the EQS's for BOD and Total Ammonia at 6 sites at the landfill area complex (see Table 1 & Figure 1).

Of the total ammonia exceedances, one originated from the small stream identified in the dry weather survey as being grossly contaminated with leachate (site 9). Concentrations of total ammonia and BOD levels at this site were much lower during the wet weather survey than those reported during the dry weather survey. Since the dry weather survey, Devon Waste Management (DWM) have undertaken work in this area which may account for the apparent improvement in quality (dilution factor may also be partly responsible).

The origin of the high total ammonia concentration at site 6 was not found. No discernable inputs were identified between this and the next site upstream. Since the downstream concentration of total ammonia was 0.51 mg/l and the upstream was 0.62 mg/l, the high concentration of 3.0 mg/l at site 6 may be the result of sampler or laboratory error.

The second input containing high concentrations of total ammonia was identified as coming from the silt traps by the side of the road (site 14). Coloured run-off water from the newly grassed landfill areas was flowing along the road, picking up more suspended solids matter and flowing into the traps. At the start of the survey, all the traps were full and overflowing into the stream.

The outflow from the silt traps was still high in suspended solids of which, a high proportion was mineral based (92 % mineral fraction). The organic fraction probably accounted for the high BOD levels. Once the grassed areas have become fully established, the suspended solids content of the run-off during wet weather will very probably reduce.

Concentrations of total iron at the tip site were very high (greatest concentration 57.0 mg/l, EQS applied 1.0 mg/l). No other metals analysed for exceeded the standards. High concentrations of iron were detected at site 14 (silt trap), site 9 (previously the 'grossly contaminated with leachate') and upstream of the tip area at site 15. High concentrations at site 15 undoubtedly come from a breakers yard which is upstream of the landfill site at the headwaters. The rest of the inputs were from run-off (silt traps) and probable leachate contamination (site 9).

During the wet weather survey, the stream substrate at site 2 (Leighty Water) looked poor. At first sight what looked like sewage fungus cover was a very fine covering of silt over diatomous growth. Although no EQS's of the determinands analysed for were exceeded at this site, it is possible that the finely divided fraction of suspended solids from the tip run-off was reaching the site giving rise to poor aesthetic quality. In order to continue the general increase in the water quality of the Peagham stream it would be prudent to increase the effectiveness of the silt/suspended solids barriers at the landfill site.

6. CONCLUSIONS

1. During dry weather conditions Deep Moor landfill site was not causing an impact at Leighty Water.
2. Deep Moor landfill site was not causing a chemical impact at Town Mills or Leighty Water during wet weather conditions
3. The work carried out by DWM on a small tributary contaminated with leachate appears to have resulted in increased water quality of the tributary at the time of sampling although BOD levels and total ammonia concentrations were still marginally above EQS's.

4. During wet weather conditions surface run-off containing BOD levels and total ammonia concentrations marginally above the EQS's from the landfill area and associated tracks was entering the watercourse via inadequately designed silt-traps.
5. The high suspended solids content of the run-off from the Deep Moor landfill site is probably contributing to the poor visual aspect of the stream substrate at Leighty Water.
6. High concentrations of total iron are entering the watercourse via run-off from the tip and from possible leachate contamination during wet weather.
7. The high concentration of total iron in stream water above the landfill site during the wet weather was likely to have originated from a breakers yard at the headwaters of the stream.

7. RECOMMENDATIONS

1. The WQO to be aware of the inputs to the Peagham Stream from the Deep Moor landfill site under wet weather conditions.
Action: WQO
2. The WQO to visit the breakers yard upstream of the tip site with a view to preventing high concentrations of iron entering the stream during wet weather.
Action: WQO
3. The WQO to be aware of the possible aesthetic impact that finely divided suspended solids from Deep Moor landfill site run-off may have on the stream bed downstream.
Action: WQO

Figure 1. Map showing detail of Deep Moor landfill site 11 January 1996.

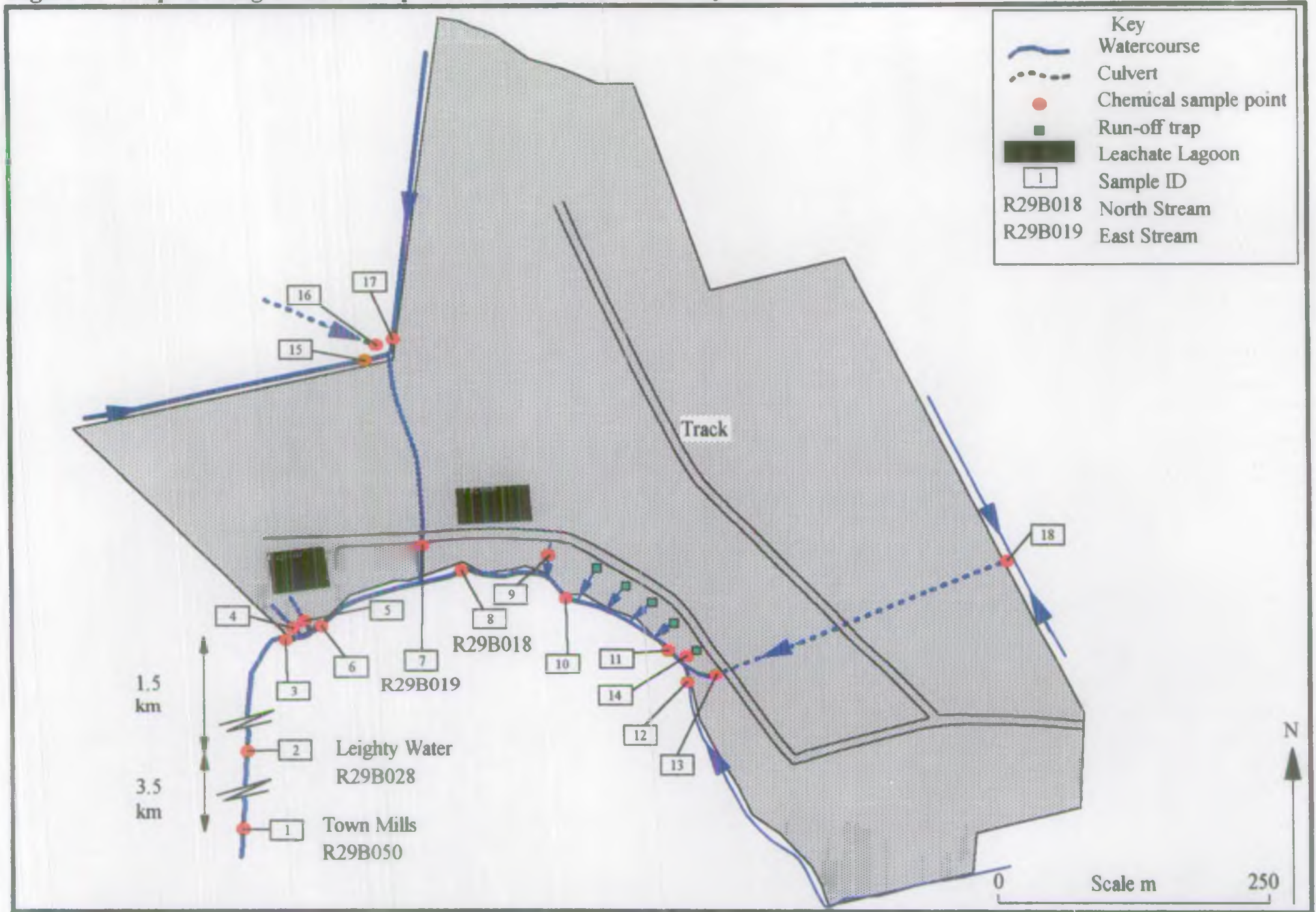


Table 1. Deepmoor tip Chemical Investigation during wet weather 11 January 1996.

Site	pH	Conductivity µS/cm	Turbidity FTU	BOD mg/l	Dissolved Oxygen % Sat.	Ammonia total mg/l	Sus. solids mg/l 105°C	Sus. Solids mg/l 500°C	Hardness total mg/l	Cadmium total µg/l	Zinc total mg/l	Copper total mg/l	Iron total mg/l
1	7.65	197	13	1.2	93	0.04	10	NR	60.5	<0.1	0.006	<0.0025	0.38
2	7.50	205	18	1.5	95	0.06	13	NR	61.3	<0.1	0.014	<0.0025	0.54
3	8.10	266	3800	5.1	94	0.51	2410	2200	600.0	1.4	0.292	0.0640	57.00
4	6.75	176	328	1.4	NR	0.07	211	191	47.1	<0.1	0.028	0.0070	5.50
5	6.70	361	10	1.0	NR	<0.03	<3	NR	132.0	0.2	0.088	<0.0025	<0.05
6	8.05	261	3950	5.2	NR	3.00	2620	2410	610.0	1.2	0.188	0.0440	31.20
7	7.55	195	922	1.4	NR	<0.03	485	447	65.5	0.1	0.033	0.0130	8.10
8	8.15	237	4200	5.6	NR	0.62	2780	2560	631.0	1.4	0.224	0.0540	26.00
9	8.30	145	4130	5.8	NR	1.10	2630	2450	131.0	0.5	0.141	0.0520	30.80
10	8.10	261	3400	5.4	NR	0.36	2360	2180	672.0	1.3	0.210	0.0470	22.80
11	7.90	299	1095	3.1	NR	0.36	663	606	192.0	0.3	0.066	0.0170	8.10
12	6.60	157	20	2.3	NR	0.16	14	NR	36.8	<0.1	0.008	0.0040	0.64
13	7.70	323	526	2.6	NR	0.27	363	332	138.0	0.2	0.047	0.0120	5.60
14	8.10	267	2950	5.0	NR	0.84	2000	1840	589.0	1.2	0.220	0.0500	31.20
15	7.35	236	18	2.1	NR	0.07	10	NR	71.4	<0.1	0.012	0.0030	0.46
16	6.25	150	48	1.7	NR	0.09	28	22	27.7	<0.1	0.018	0.0050	0.74
17	7.05	195	23	2.1	NR	0.03	16	NR	63.5	<0.1	0.006	0.0030	0.49
18	6.75	261	79	<1.0	NR	0.17	46	40	88.7	<0.1	0.011	0.0030	0.84

Environmental Quality Standards

Dissolved Oxygen 80 % sat. as a 10 %-ile
 BOD (ATU) 4.0 mg/l as 95 %-ile
 Total Ammonia 0.6 mg/l as 95 %-ile
 pH 6 - 9 as 5 %-ile & 95 %-ile
 Dissolved Iron 1.0 mg/l as annual average
 Total Cadmium 5.0 µg/l as annual average

Total Hardness mg/l	Total Zinc mg/l as 95 %-ile	Dissolved Copper mg/l as 95 %-ile
=< 10	0.03	0.005
>10 and =<50	0.20	0.022
<50 and =<100	0.30	0.040
> 100	0.50	0.112

2.55 = Standard exceeded.

NB. Dissolved metals results were not possible due to inability to filter very turbid samples.
 Standards for the dissolved metals have been applied to the total metals results.

APPENDIX I

Town Mills (R29B050)

ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM AT TOWN MILLS

Date	Time	Type	Mat	AMMON- IA MG/L	BOD ATU MG/L	OXYGEN DISS O %	SOLIDS SUSP MG/L	CADMI- UM UG/L	COPPER TOTAL MG/L	ZINC TOTAL MG/L	HARDN TOTAL MG/L
120298	1430	SQMR	2F	0.02<	1.0<	95	3				
190298	1045	SQMR	2F	0.02<	1.0<	95	3	0.20<	0.001<	0.002<	78.
250298	1050	SQMR	2F	0.02<	1.3	98	6				
150398	1130	SQMR	2F	0.02<	1.3	103	5				
230398	0915	SQMR	2F	0.02<	1.9	99	7	0.20<	0.002	0.011	65.
080498	1405	SQMR	2F	0.02<	1.6	93	9				
240498	1420	SQMR	2F	0.02<	1.6	109	6	0.20<	0.002	0.005	62.
120598	1350	SQMR	2F	0.02<	1.8	96	5				
260598	0955	SQMR	2F	0.03	2.8	94	21	0.20<	0.003	0.009	65.
250698	1355	SQMR	2F	0.13	1.6	95	4	0.20<	0.001	0.003	76.
260798	1100	SQMR	2F	0.02<	1.5	98	2<	0.20<	0.001	0.002	70.

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ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM AT TOWN MILLS

Date	Time	Type	Mat	AMMON- IA MG/L	BOD ATU MG/L	OXYGEN DISS O %	SOLIDS SUSP MG/L	CADMI- UM UG/L	COPPER TOTAL MG/L	ZINC TOTAL MG/L	HARDN TOTAL MG/L
070998	1355	SQMR	2F	0.02<	1.5	94	3	0.20<	0.001<	0.004	67.
280998	0925	SQMR	2F	0.02<	1.6	96	5	0.20<	0.002	0.005	76.
291098	0920	SQMR	2F	0.02<	1.2	98	2<	0.20<	0.002	0.006	70.
031198	1125	SQMR	2F	0.02<	2.7	98	8				
151198	1010	SQMR	2F	0.02<	1.7	97	3				
251198	1120	SQMR	2F	0.02<	1.5	98	8	0.20<	0.001	0.004	62.
171298	1305	SQMR	2F	0.78	2.5	98	21	0.20<	0.002	0.011	68.
200194	1045	SQMR	2F	0.13	1.5	99	4	0.20<	0.001<	0.005	61.
100294	1040	SQMR	2F	0.30	1.8	99	4	0.20<	0.001<	0.007	62.
030394	1130	SQMR	2F	0.15	1.0	96	6	0.20<	0.001<	0.003	60.
310394	1350	SQMR	2F	0.96	4.4	98	30	0.20<	0.002	0.011	63.

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Town Mills (R29B050)

ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM AT TOWN MILLS

Date	Time	Type	Mat	AMMON- IA MG/L	BOD ATU MG/L	OXYGEN DISS % SATN	SOLIDS SUSP MG/L	CADMI- UM UG/L	COPPER TOTAL MG/L	ZINC TOTAL MG/L	HARDNE TOTAL MG/L
050594	1135	SQMR	2F	3.60	12.2	85	10	0.20<	0.001	0.009	104
280694	0940	SQMR	2F	0.02<	1.0	98	4	0.20<	0.001	0.004	68
250794	1215	SQMR	2F	0.03	1.0<	94	3	0.20<	0.018	0.002<	71
260894	1315	SQMR	2F	0.02	1.7	106	7	0.20<	0.001	0.004	72
101094	1230	SQMR	2F	0.02<	1.0<	94	3	0.20<	0.001<	0.002<	68
311094	1215	SQMR	2F	0.39	2.6	92	44	0.20<	0.002	0.012	58
171194	1300	SQMR	2F	0.03	1.2	95	7	0.20<	0.001	0.004	60
071294	1015	SQMR	2F	0.08	1.8	101	32	0.20<	0.004	0.014	59
250195	1245	SQMR	2F	0.13	2.0	106					
150295	1145	SQMR	2F	1.30	3.3	97					
230395	1520	SQMR	2F	0.03<	1.2	100					

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ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM AT TOWN MILLS

Date	Time	Type	Mat	AMMON- IA MG/L	BOD ATU MG/L	OXYGEN DISS % SATN	SOLIDS SUSP MG/L	CADMI- UM UG/L	COPPER TOTAL MG/L	ZINC TOTAL MG/L	HARDNE TOTAL MG/L
050495	1030	SQMR	2F	0.03<	1.6	100					
270495	1030	SQMR	2F	0.03<	1.5	102					
240595	0905	SQMR	2F	0.03<	1.3	97					
150695	1600	SQMR	2F	0.03<	1.6	96					
050795	1015	SQMR	2F	0.03<	1.0<	100					
080895	0905	SQMR	2F	0.03<	1.1	78					
140995	1505	SQMR	2F	0.03<	1.8	92					
191095	1420	SQMR	2F	0.03<	1.1	104					
091195	0850	SQMR	2F	0.03<	1.6	91					
110196	1507	SQMR	2F	0.04	1.0<	99					
020296	0937	SQMR	2F	0.03<	1.2	102					

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ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM AT TOWN MILLS

Date	Time	Type	Mat	AMMON- IA MG/L	BOD ATU MG/L	OXYGEN DISS % SATN	SOLIDS SUSP MG/L	CADMI- UM UG/L	COPPER TOTAL MG/L	ZINC TOTAL MG/L	HARDNE TOTAL MG/L
190296	1002	SQMR	2F	0.03<	1.6	101					

Leighty Water (R29B028)

ANALYTICAL SUMMARY OF:-

DEEP MOOR TIP - DOWNSTREAM

(D.C.C. NORTH AREA)

Date	Time	Type	Purp	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
					MG/L	N MG/L	O % SATN	MG/L	UG/L	MG/L	MG/L	MG/L
150192	1425	SAUD	2F		0.50<	1.0<		3		0.200<	0.100<	
020392	1030	SAUD	2F		0.50<	1.1		15		0.200<	0.100<	
010592	1210	SAUD	2F		0.50<	2.7		24		0.200<	0.100<	
200792	1525	SAUD	2F		0.50<	4.1		90		0.200<	0.100<	
040992	1155	SAUD	2F		0.03	1.0<	97	3		0.001	0.003	
061092	1315	SAUD	2F		8.20	5.8		10		0.200<	0.200<	
101192	0955	SAUD	2F		0.60	2.0		36		0.100<	0.200<	
260193	1400	SAUD	2F		0.50<	1.5		3		0.200<	0.100<	
230393	1410	SGMR	2F		0.50<	4.3		3		0.200<	0.100<	
240493	0840	SAUD	2F		0.50<	1.4		4		0.200<	0.100<	
260793	1020	SAUD	2F		0.70	2.0		3		0.200<	0.100<	

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ANALYTICAL SUMMARY OF:-

DEEP MOOR TIP - DOWNSTREAM

(D.C.C. NORTH AREA)

Date	Time	Type	Purp	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
					MG/L	N MG/L	O % SATN	MG/L	UG/L	MG/L	MG/L	MG/L
230993	1435	SAUD	2F		0.50<	1.0<		3		0.200<	0.100<	
251193	1020	SAUD	2F		0.50<	2.2		12		0.200<	0.400	
200194	1210	SAUD	2F		1.40	10.1<		7		0.200<	0.300	
030394	1105	SAUD	2F		0.50<	1.0<		4<		0.200<	0.100<	
280694	1410	SAUD	2F		0.50<	4.3		6		0.200<	0.100<	
250794	1145	SAUD	2F		0.50<	1.3		2		0.200<	0.100<	
260894	1425	SAUD	2F		0.50<	1.7		5		0.200<	0.200	
101094	1140	SAUD	2F		0.50<	1.0		2<		0.200<	0.100<	
311094	1135	SAUD	2F		2.90	13.8		44		0.010<	0.040	
230395	1430	SAUD	2F		0.50<	2.2		6		0.200<	0.100<	
050495	1050	SAUD	2F		0.50<	1.1		3		0.025<	0.050<	

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ANALYTICAL SUMMARY OF:-

DEEP MOOR TIP - DOWNSTREAM

(D.C.C. NORTH AREA)

Date	Time	Type	Purp	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
					MG/L	N MG/L	O % SATN	MG/L	UG/L	MG/L	MG/L	MG/L
240595	0935	SAUD	2F		0.50<	1.1		3<		0.200<	0.100<	
150695	1520	SAUD	2F		0.50<	2.3		3		0.200<	0.100<	
090895	1025	SAUD	2F		0.50<	3.4		9		0.200<	0.100<	

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TYPE ONLINE READY

Deep Moor Stream North (R29B018)

ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM BELOW DEEP MOOR LANDFILL TORRINGTON DEEP MOOR

Date	Time	Type	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
		Purp		MG/L	MG/L	% SATN	MG/L	UG/L	MG/L	MG/L	MG/L
150192	1445	SAUD	5K	0.50<	1.0<		2<		0.200<	0.100<	
020392	1020	SAUD	6C	0.50<	1.0<		2		0.200<	0.100<	
010592	1150	SAUD	6C	0.50<	1.3		9		0.200<	0.100<	
200792	1445	SAUD	6C	0.50<	4.7		188		0.200<	0.100<	
061092	1255	SAUD	6C	0.50<	1.3		6		0.200<	0.200<	
101192	1010	SAUD	6C	0.50<	1.5		31		0.100<	0.200<	
260193	1420	SQMR	2F	0.04	1.4	94	3	0.20<	0.001<	0.004	
150293	1355	SQMR	2F	0.02	1.0<	95	2	0.20<	0.001<	0.003	
190293	1130	SQMR	2F	0.03	1.0<	92	2	0.20<	0.001<	0.003	
240493	0855	SQMR	2F	0.36	1.1	98	3	0.20<	0.001	0.007	
260793	1005	SQMR	2F	4.70	4.8	78	4	0.20<	0.002	0.006	60.9

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TYPE ONLINE READY

ANALYTICAL SUMMARY OF:-

PEAGHAM STREAM BELOW DEEP MOOR LANDFILL TORRINGTON DEEP MOOR

Date	Time	Type	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
		Purp		MG/L	MG/L	% SATN	MG/L	UG/L	MG/L	MG/L	MG/L
280993	1415	SQMR	2F	0.09	1.1	90	4	0.20<	0.001	0.004	45.0
251193	1000	SQMR	2F	0.12	1.6	90	6	0.20<	0.002	0.005	48.0
200194	1200	SQMR	2F	5.90	34.7>	90	20	0.20<	0.002	0.021	66.2
030394	1040	SQMR	2F	0.15	1.0<	94	5	0.20<	0.001<	0.005	41.0
250794	1120	SQMR	2F	1.30	3.0<	83	4	0.20<	0.001<	0.002<	91.0
260894	1430	SQMR	2F	0.29	1.7	101	5	2.00<	0.010<	0.020<	69.0
311094	1110	SQMR	2F	2.30	10.1	90	47	0.20<	0.004	0.021	88.3
230395	1440	SAUD	2F	0.05	1.0	95	5	0.50<	0.002<	0.005<	35.0
050495	1110	SAUD	2F	0.12	1.2	92	3<	0.50<	0.002<	0.005<	37.0
240595	0945	SAUD	2F	0.06	1.0<	94	3<	0.50<	0.002<	0.005<	50.9
150695	1525	SAUD	2F	0.03<	1.4	105	4	0.50<	0.002<	0.005<	47.0

Type "C" to Continue, "P" for previous screen, "Q" to Quit ()

TYPE ONLINE READY

Deep Moor Stream East (R29B019)

ANALYTICAL SUMMARY OF:-

FEAGHAM STREAM ABOVE DEEP MOOR LANDFILL TORRINGTON DEEP MOOR

Date	Time	Type	Purp	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
					MG/L	N MG/L	O % SATN	MG/L	UG/L	MG/L	MG/L	MG/L
150192	1440	SAUD	5K		0.90	1.4		23		0.200	0.100	
20392	1015	SAUD	6C		0.50	10.0		23400		0.800	0.800	
10592	1155	SAUD	6C		0.50	3.1		18		0.200	0.100	
200792	1455	SAUD	6C		0.70	5.2		3720		0.200	0.200	
151092	1250	SAUD	6C		0.50	1.0		4		0.200	0.200	
101192	1005	SAUD	6C		0.90	3.8		34		0.100	0.200	
260193	1415	SQMR	2F		0.10	1.0	96	3	0.20	0.001	0.008	
150293	1350	SQMR	2F		0.56	1.6	95	5	0.20	0.002	0.010	
190293	1125	SQMR	2F		1.70	2.4	93	17	0.20	0.002	0.012	
140493	0850	SQMR	2F		0.08	1.4	104	4	0.20	0.001	0.007	
260793	1010	SQMR	2F		0.44	8.0	89	7	0.20	0.001	0.007	102.0

Type "C" to Continue, "P" for previous screen, "Q" to Quit ()

TYPE ONLINE READY

ANALYTICAL SUMMARY OF:-

FEAGHAM STREAM ABOVE DEEP MOOR LANDFILL TORRINGTON DEEP MOOR

Date	Time	Type	Purp	Mat	AMMON- IA	BOD ATU	OXYGEN DISS	SOLIDS SUSP	CADMI- UM	COPPER TOTAL	ZINC TOTAL	HARDNS TOTAL
					MG/L	N MG/L	O % SATN	MG/L	UG/L	MG/L	MG/L	MG/L
230993	1420	SQMR	2F		1.40	68.8	93	33	0.20	0.003	0.029	171.0
151193	0955	SQMR	2F		1.10	29.8	90	108	0.20	0.007	0.041	154.0
200194	1150	SQMR	2F		6.20	35.9	88	70	0.20	0.004	0.063	143.0
030394	1045	SQMR	2F		0.75	2.3	91	38	0.20	0.003	0.008	66.7
130694	1420	SQMR	2F		2.80	6.7	90	14	0.20	0.002	0.008	177.0
130894	1440	SQMR	2F		0.74	3.9	73	15	2.00	0.010	0.020	252.0
311094	1120	SQMR	2F		0.12	1.4	89	18	0.20	0.002	0.008	40.6
130395	1450	SAUD	2F		1.60	1.5	92	5	0.50	0.002	0.007	66.3
150495	1115	SAUD	2F		1.30	1.4	91	10	0.50	0.002	0.006	79.5
240595	0950	SAUD	2F		53.00	65.2	40	34	0.50	0.003	0.164	201.0

Type "C" to Continue, "P" for previous screen, "Q" to Quit ()

TYPE ONLINE READY

APPENDIX II

TABLE 1 : STANDARDS FOR THE FIVE RIVER ECOSYSTEM USE CLASSES

Use Class	DO % sat 10%ile	BOD (ATU) mg/l 90%ile	Total Ammonia mgN/l 95%ile	Un-ionised Ammonia mgN/l 95%ile	pH 5%ile & 95%ile	Hardness mg/l CaCO ₃	Dissolved Copper µg/l 95%ile	Total Zinc µg/l 95%ile	Class Description
1	80	2.5	0.25	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	30 200 300 500	Water of very good quality suitable for all fish species
2	70	4.0	0.6	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	30 300 300 500	Water of good quality suitable for all fish species
3	60	6.0	1.3	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	300 700 1000 2000	Water of fair quality suitable for high class coarse fish populations
4	50	8.0	2.5		6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	300 700 1000 2000	Water of fair quality suitable for coarse fish populations
5	20	15.0	9.0						Water of poor quality which is likely to limit coarse fish populations

APPENDIX III

MEMORANDUM

To: Chris Westcott
From: Peter Rose Investigations Technician Devon Area
Extn: 2037

Our ref: DEEP1
Your ref:

Date: 7 August 1995

DEEPMOOR TIP INVESTIGATION

Just to keep you informed on the progress into the possible leachate problems with the tip.

A biological collection carried out at Leighty Water above the septic tank discharge indicated good water quality; only a trace of sewage fungus was found. The water sample taken did not exceed Environmental Quality Standards (see Figure 1). No further D/S sampling was deemed to be necessary.

At the tip site water levels were very low; no biological samples could be collected. The results of the water samples are given in Figure 2. The main area of concern lies at site DMSP9L, a small pipe from under the track leading to a wet gully which enters the stream. From the chemical samples taken (including a GCMS scan showing a number of organic purification by-products), the results indicate leachate contamination. Impact of this discharge was still apparent D/S at the boundary of the site; it must be stressed that at the time of sampling, the flow of both discharge and receiving stream was very low and at points the watercourse appeared to be just ponding.

At site DMW8, a sample contained an elevated total ammonia concentration. The culvert just upstream of this site crosses a leachate pipe and it is possible there is slight contamination.

The conclusions at present include:

1. The tip was not causing an impact at Leighty Water at the time of sampling (May 1995).
2. Discharge from a pipe (DMSP9L) from the tip area is contaminated with leachate which in turn is entering the watercourse.
3. A culverted stream (DMW8) may be slightly contaminated by leachate.

This is just an out-line of what has been identified so far. The aim is to carry out an extensive investigation when the rains finally come to assess run-off, possible increased leachate production and greater flows in the stream. All the above information will be presented in the final report.

PETER ROSE
Investigations Technician Devon Area

Figure 1 Map showing Deepmoor Tip area.

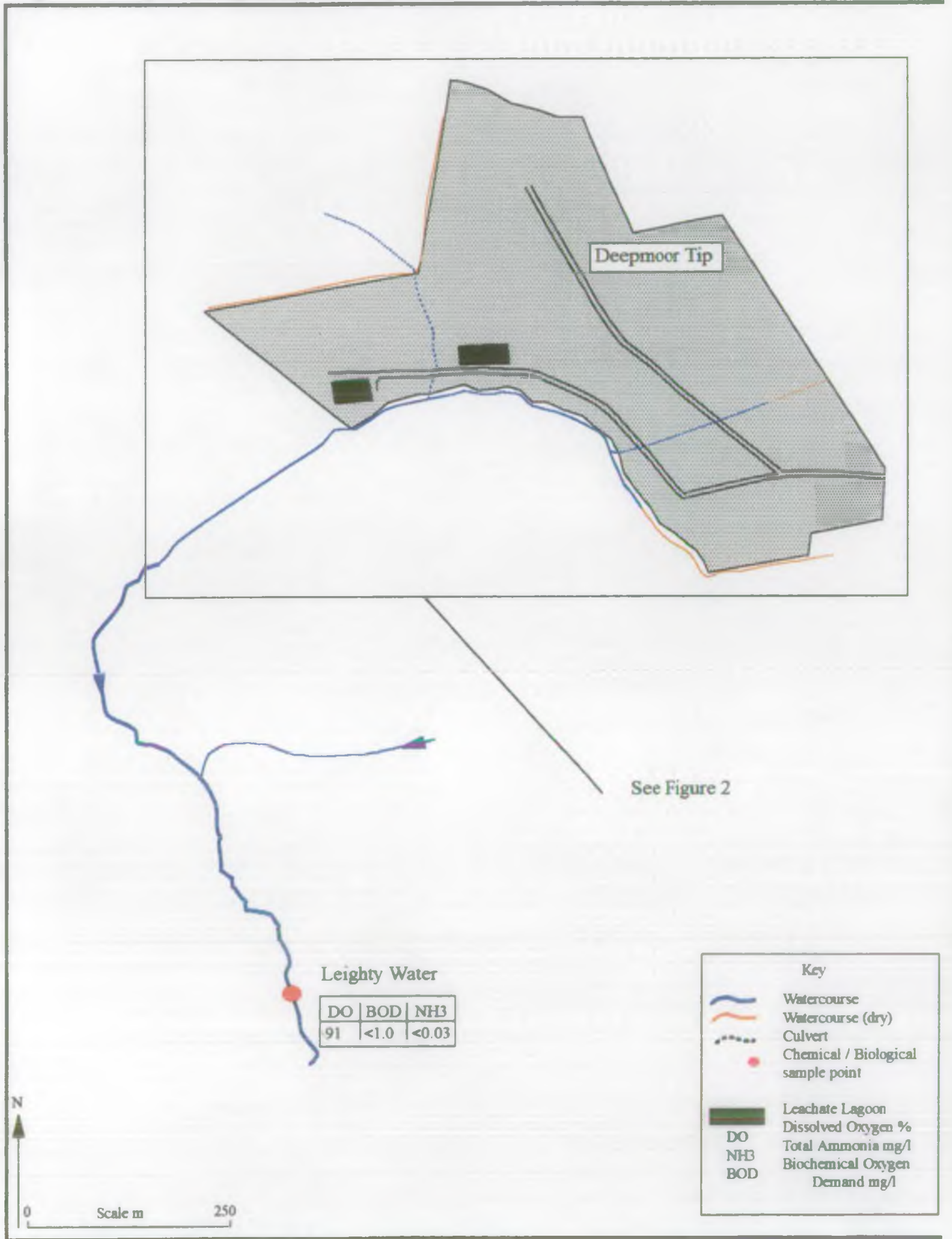


Figure 2. Map showing detail of Deepmoor Tip Site.

