

**A737 Dalry Bypass Environmental Statement
Stage 3 SI Water Quality Data Summary**

Surface Water

Location	Depth	Contaminant	Result	Environmental Quality Standard	Drinking Water Standard	Units	Limits of Detection
S1		Total Aluminium	210	15	200	ug/l	10
S1		Total Iron	1000	1000	200	ug/l	5.5
S1		Total Manganese	70	30	50	ug/l	0.22
S10		Aluminium, Dissolved	28	15		ug/l	10
S11		Aluminium, Dissolved	29	15		ug/l	10
S2		Total Aluminium	2200	15	200	ug/l	10
S2		Total Iron	6800	1000	200	ug/l	5.5
S2		Total Manganese	510	30	50	ug/l	0.22
S3		Total Iron	460	1000	200	ug/l	5.5
S4		Total Aluminium	3100	15	200	ug/l	10
S4		Total Iron	19000	1000	200	ug/l	5.5
S4		Total Manganese	520	30	50	ug/l	0.22
S6		Aluminium, Dissolved	26	15		ug/l	10
S6		Total Iron	430	1000	200	ug/l	5.5
S7		Total Aluminium	1600	15	200	ug/l	10
S7		Total Iron	5600	1000	200	ug/l	5.5
S7		Total Manganese	640	30	50	ug/l	0.22
S8		Aluminium, Dissolved	27	15		ug/l	10
S9		Aluminium, Dissolved	23	15		ug/l	10

Note: Only elevated contaminants listed.
Full chemical test data reported in Phase 2 Ground Investigation: Factual Report on Ground Investigation, IFA, April 13

A737 Dalry Bypass Environmental Statement
Stage 3 SI Water Quality Data Summary

mouchel FAIRHURST

Groundwater

Location	Depth	Contaminant	Result	Environmental Quality Standard	Drinking Water Standard	Units	Limits of Detection
2BH002	42.5	Aluminium, Dissolved	27	15		ug/l	10
2BH002	42.5	Magnesium, Dissolved	11000	30	50	ug/l	20
2BH002	42.5	Manganese, Dissolved	44	30	50	ug/l	0.22
2BH002	42.5	Total Aluminium	480	15	200	ug/l	10
2BH002	42.5	Total Iron	710	1000	200	ug/l	5.5
2BH003	75	Aromatic C21-C35	66	20	20	ug/l	1
2BH003	75	Manganese, Dissolved	850	30	50	ug/l	0.22
2BH003	75	Total Aluminium	2300	15	200	ug/l	10
2BH003	75	Total Iron	19000	1000	200	ug/l	5.5
2BH004	21	Magnesium, Dissolved	32000	30	50	ug/l	20
2BH004	21	Manganese, Dissolved	150	30	50	ug/l	0.22
2BH004	21	Total Aluminium	52000	15	200	ug/l	10
2BH004	21	Total Iron	120000	1000	200	ug/l	5.5
2BH005	22.5	Manganese, Dissolved	160	30	50	ug/l	0.22
2BH005	22.5	Sulphate as SO4	270		250	mg/l	0.1
2BH005	22.5	Total Aluminium	20000	15	200	ug/l	10
2BH005	22.5	Total Iron	50000	1000	200	ug/l	5.5
2BH006	23	Manganese, Dissolved	85	30	50	ug/l	0.22
2BH006	23	Total Aluminium	6300	15	200	ug/l	10
2BH006	23	Total Iron	16000	1000	200	ug/l	5.5
Note:	Only el	Aromatic C16-C21	38	20	20	ug/l	1
2BH007	Full ch	Aromatic C21-C35	130	20	20	ug/l	1
2BH007	28	Manganese, Dissolved	80	30	50	ug/l	0.22
2BH007	28	Total Aluminium	39000	15	200	ug/l	10
2BH007	28	Total Iron	90000	1000	200	ug/l	5.5
2BH008	15.2	Total Aluminium	16000	15	200	ug/l	10
2BH008	15.2	Total Iron	27000	1000	200	ug/l	5.5
2BH009	14.5	Aluminium, Dissolved	24	15		ug/l	10
2BH009	14.5	Aromatic C21-C35	24	20	20	ug/l	1
2BH009	14.5	Total Aluminium	21000	15	200	ug/l	10
2BH009	14.5	Total Iron	38000	1000	200	ug/l	5.5
2BH015C		Aluminium, Dissolved	26	15		ug/l	10
2BH015C		Aromatic C12-C16	33	20	20	ug/l	1
2BH015C		Aromatic C21-C35	26	20	20	ug/l	1
2BH015C		Benzene	2	10	1	ug/l	1
2BH015C		Total Aluminium	29000	15	200	ug/l	10
2BH015C		Total Iron	150000	1000	200	ug/l	5.5
2BH017	2.5	Manganese, Dissolved	200	30	50	ug/l	0.22
2BH017	2.5	Total Aluminium	6600	15	200	ug/l	10
2BH017	2.5	Total Iron	4300	1000	200	ug/l	5.5
2BH017	2.5	Total Manganese	1100		50	ug/l	0.22
2BH031	17.6	Benzo(g,h,i)perylene	0.02	0.002	0.1	ug/l	0.01
2BH031	17.6	Total Aluminium	1300	15	200	ug/l	10
2BH031	17.6	Total Iron	2500	1000	200	ug/l	5.5
2BH031	17.6	Total Manganese	110		50	ug/l	0.22
2BH048	0.5	Manganese, Dissolved	2200	30	50	ug/l	0.22
2BH048	0.5	Total Aluminium	11000	15	200	ug/l	10
2BH048	0.5	Total Iron	20000	1000	200	ug/l	5.5
2BH048	0.5	Total Manganese	3300		50	ug/l	0.22
2BH051	3.9	Manganese, Dissolved	2100	30	50	ug/l	0.22
2BH051	3.9	Total Aluminium	6500	15	200	ug/l	10
2BH051	3.9	Total Iron	11000	1000	200	ug/l	5.5
2BH051	3.9	Total Manganese	2800		50	ug/l	0.22
2BH073	13	Manganese, Dissolved	140	30	50	ug/l	0.22
2BH073	13	Total Aluminium	3300	15	200	ug/l	10
2BH073	13	Total Iron	8200	1000	200	ug/l	5.5
2BH073	13	Total Manganese	580		50	ug/l	0.22
G1		Aluminium, Dissolved	26	15		ug/l	10
M1		Aluminium, Dissolved	48	15		ug/l	10

Note: Only elevated contaminants listed.

Full chemical test data reported in Phase 2 Ground Investigation: Factual Report on Ground Investigation, IFA, April 13

Water body ID	Water body name	Reporting parameter code	Reporting parameter	Class
10381	River Garnock (Powgree Burn to Rye Water)	1	Overall status	Bad
10381	River Garnock (Powgree Burn to Rye Water)	1-1	Pre-HMWB status	Bad
10381	River Garnock (Powgree Burn to Rye Water)	1-3	Overall ecology	Bad
10381	River Garnock (Powgree Burn to Rye Water)	1-3-1	Physico-Chem	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-1-1	Temperature	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-1-2	Soluble reactive phosphorus	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-1-3	pH	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-1-4	Dissolved Oxygen	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2	Biological elements	Moderate
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-1	Phytobenthos	Moderate
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-3	Benthic invertebrates	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-3-3	Macro-invertebrates (RiCT)	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-3-3-1	Macro-invertebrates (ASPT)	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-3-3-2	Macro-invertebrates (NTAXA)	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-5	Fish	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-2-5-2	Fish barrier	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3	Specific pollutants	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-14	Ammonium	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-16	Chromium	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-2	Arsenic	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-4	Diazinon	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-7	Iron	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-8	Copper	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-3-9	Zinc	Pass
10381	River Garnock (Powgree Burn to Rye Water)	1-3-4	Hydromorphology	Bad
10381	River Garnock (Powgree Burn to Rye Water)	1-3-4-1	Morphology	Bad
10381	River Garnock (Powgree Burn to Rye Water)	1-3-4-2	Hydrology	Moderate
10381	River Garnock (Powgree Burn to Rye Water)	1-3-4-2-1	Hydrology (impoundment)	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-4-2-2	Hydrology (abstraction)	Moderate
10381	River Garnock (Powgree Burn to Rye Water)	1-3-5-4	Regulatory ammonium	High
10381	River Garnock (Powgree Burn to Rye Water)	1-3-6-1	Water quality	Moderate
10381	River Garnock (Powgree Burn to Rye Water)	1-3-6-2	Morphological pressures	Bad

Water body ID	Water body name	Reporting parameter code	Reporting parameter	Class
10380	River Garnock (Rye Water to Caaf Water)	1	Overall status	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-1	Pre-HMWB status	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3	Overall ecology	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3-1	Physico-Chem	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-1-1	Temperature	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-1-2	Soluble reactive phosphorus	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-1-3	pH	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-1-4	Dissolved Oxygen	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-2	Biological elements	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-1	Phytobenthos	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-3	Benthic invertebrates	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-3-3	Macro-invertebrates (RiCT)	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-3-3-1	Macro-invertebrates (ASPT)	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-3-3-2	Macro-invertebrates (NTAXA)	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-5	Fish	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3-2-5-2	Fish barrier	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3-3	Specific pollutants	Pass
10380	River Garnock (Rye Water to Caaf Water)	1-3-3-14	Ammonium	Pass
10380	River Garnock (Rye Water to Caaf Water)	1-3-4	Hydromorphology	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-4-1	Morphology	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-4-2	Hydrology	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-4-2-1	Hydrology (impoundment)	Good
10380	River Garnock (Rye Water to Caaf Water)	1-3-4-2-2	Hydrology (abstraction)	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-5-4	Regulatory ammonium	High
10380	River Garnock (Rye Water to Caaf Water)	1-3-6-1	Water quality	Moderate
10380	River Garnock (Rye Water to Caaf Water)	1-3-6-2	Morphological pressures	Moderate

Water body ID	Water body name	CATEGORY	Reporting parameter	Reporting parameter	Class
10379	River Garnock (Caaf Water to Tidal Limit)	River	1	Overall status	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-1	Pre-HMWB status	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2	Overall chemistry	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1	Priority substances	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-1	Benzo-a-pyrene	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-10	Fluoranthene	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-13	Lead	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-14	Naphthalene	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-15	Nickel	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-17	Simazine	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-25	Diethylhexylphthalate (DEHP)	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-26	Chlorfenvinphos	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-3	Anthracene	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-4	Atrazine	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-5	Benzo-(B+K)-Fluoranthene	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-2-1-7	Cadmium	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3	Overall ecology	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-1	Physico-Chem	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-1-1	Temperature	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-1-2	Soluble reactive phosphorus	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-1-3	pH	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-1-4	Dissolved Oxygen	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2	Biological elements	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-1	Phytobenthos	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-2	Macrophytes	Good
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-3	Benthic invertebrates	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-3-3	Macro-invertebrates (RiCT)	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-3-3-1	Macro-invertebrates (ASPT)	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-3-3-2	Macro-invertebrates (NTAXA)	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-5	Fish	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-2-5-2	Fish barrier	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3	Specific pollutants	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-14	Ammonium	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-16	Chromium	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-2	Arsenic	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-4	Diazinon	Pass

10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-7	Iron	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-8	Copper	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-3-9	Zinc	Pass
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-4	Hydromorphology	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-4-1	Morphology	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-4-2	Hydrology	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-4-2-1	Hydrology (impoundment)	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-4-2-2	Hydrology (abstraction)	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-5-4	Regulatory ammonium	High
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-6-1	Water quality	Moderate
10379	River Garnock (Caaf Water to Tidal Limit)	River	1-3-6-2	Morphological pressures	Moderate

Water body ID	Water body name	Reporting parameter code	Reporting parameter	Class
10390	Rye Water	1	Overall status	Good ecological potential
10390	Rye Water	1-1	Pre-HMWB status	Poor
10390	Rye Water	1-3	Overall ecology	Poor
10390	Rye Water	1-3-2	Biological elements	Poor
10390	Rye Water	1-3-2-5	Fish	Poor
10390	Rye Water	1-3-2-5-2	Fish barrier	Poor
10390	Rye Water	1-3-4	Hydromorphology	Poor
10390	Rye Water	1-3-4-1	Morphology	Good
10390	Rye Water	1-3-4-2	Hydrology	Poor
10390	Rye Water	1-3-4-2-1	Hydrology (impoundment)	Poor
10390	Rye Water	1-3-4-2-2	Hydrology (abstraction)	Moderate
10390	Rye Water	1-3-6-2	Morphological pressures	Poor

Water body ID	Water body name	CATEGORY	Reporting parameter	Reporting parameter	Class
10389	Caaf Water	River	1	Overall status	Moderate ecological potential
10389	Caaf Water	River	1-1	Pre-HMWB status	Bad
10389	Caaf Water	River	1-3	Overall ecology	Bad
10389	Caaf Water	River	1-3-1	Physico-Chem	High
10389	Caaf Water	River	1-3-1-1	Temperature	High
10389	Caaf Water	River	1-3-1-2	Soluble reactive phosphorus	High
10389	Caaf Water	River	1-3-1-3	pH	High
10389	Caaf Water	River	1-3-1-4	Dissolved Oxygen	High
10389	Caaf Water	River	1-3-2	Biological elements	Moderate
10389	Caaf Water	River	1-3-2-1	Phytobenthos	Moderate
10389	Caaf Water	River	1-3-2-2	Macrophytes	Good
10389	Caaf Water	River	1-3-2-3	Benthic invertebrates	Good
10389	Caaf Water	River	1-3-2-3-3	Macro-invertebrates (RiCT)	Good
10389	Caaf Water	River	1-3-2-3-3-1	Macro-invertebrates (ASPT)	Good
10389	Caaf Water	River	1-3-2-3-3-2	Macro-invertebrates (NTAXA)	High
10389	Caaf Water	River	1-3-2-5	Fish	High
10389	Caaf Water	River	1-3-2-5-1	Fish ecology	High
10389	Caaf Water	River	1-3-2-5-2	Fish barrier	High
10389	Caaf Water	River	1-3-3	Specific pollutants	Pass
10389	Caaf Water	River	1-3-3-14	Ammonium	Pass
10389	Caaf Water	River	1-3-4	Hydromorphology	Bad
10389	Caaf Water	River	1-3-4-1	Morphology	Good
10389	Caaf Water	River	1-3-4-2	Hydrology	Bad
10389	Caaf Water	River	1-3-4-2-1	Hydrology (impoundment)	Bad
10389	Caaf Water	River	1-3-4-2-2	Hydrology (abstraction)	Good
10389	Caaf Water	River	1-3-5-4	Regulatory ammonium	High
10389	Caaf Water	River	1-3-6-1	Water quality	Moderate
10389	Caaf Water	River	1-3-6-2	Morphological pressures	Good

River Garnock @ Kilwinning

Date Taken	Time Taken	NGR	Location	SampleTemp °C	SuspSolids mg/L	Abs @254nm(40mm) Absorbance	Abs @400nm(40mm) Absorbance
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	4	5.9	0.84	0.108
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning	7	110	1.296	0.184
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	11	3.8	0.596	0.128
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	12	2.3	0.892	0.12
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	13	5.9	1.876	0.304
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	15	6.3	1.96	0.244
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	16	5	2.35	0.34
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	12	2.9	1.156	0.116
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	11 < 2		2.168	0.34
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	9	3.1	1.096	0.16
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning	8	11	1.568	0.228
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning	3	38	1.004	0.124
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	3 < 2		0.588	0.092
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning	9	3.4	0.62	0.084
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	11		0.632	0.084
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	14		0.844	0.128
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	15		0.712	0.092
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning	15		0.732	0.092
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning	14 < 2		0.796	0.096
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	11	8.2	0.876	0.12
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	7 < 2		0.812	0.12
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning	0		0.996	0.24
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning	4		0.92	0.116
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	5			
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning	9		1.428	0.2
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning	10.2		1.408	0.196
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning	14.2		0.82	0.104
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning	13.9		1.012	0.128
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning	19		0.888	0.108
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning	13.5		1.104	0.132
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning	10.4	4.2	1.496	0.196
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning	10.2	7.6	2.308	0.324
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning	7	4.8	1.052	0.136

Date Taken	Time Taken	NGR	Location	pH pH units	ElecCond-25 µS/cm	Alk as CaCO3 mg/L	Hardness mg/L	O2 - DO mg/L	O2 -%sat %
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	7.31	138	32.3	49.3		
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning	7.41	101	23.1	29.3	11.4	93.9
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	8.22	302	101	128	10.4	94.4
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	7.87	224	77.7	98.7	10.5	97.5
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	7.63	182	49	66.2	11	104
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	7.74	185	52.3	60.6	8.9	88.3
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	7.48	136	42.6	42.9	8.2	83.1
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	7.95	266	94.7	114	10.5	97.5
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	7.67	134	43.2	52	10.5	95.3
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	7.92	227	80.8	97.8	11.2	96.9
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning	7.65	167	51.9	61.8	11.3	95.5
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning	7.09	130	21.5	40.7	13.1	97.3
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	7.91	267	82.7	115	13.6	101
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning	7.91	278	84.8	104	10.9	94.4
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	8.25	312	103		11.5	104
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	7.92	300	87.8		10	97.1
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	7.63	166	38		9.7	96.3
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning	7.84	195	59.4	69.4	9.2	91.3
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning	7.6	160	50.3	59.1	9.8	95.2
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	7.56	120	33.8	48.7	10.8	98
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	7.72	313	67.5	88.8	12.2	101
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning	7.67	235	58.5	81.3	14.1	96.4
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning	7.46	187	37.4	53.9	12.6	96.1
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	7.82	232	69.7	83.2	12.8	100
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning				60.4	11.4	98.7
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning	7.32	160	48.5	53.2	10.7	95.3
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning	7.94	243	80.3	86.8	10.3	100
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning	8.04	280	90.8	106.8	9.9	95.9
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning	8.33	316	106	117.2	8.9	96
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning	7.92	259	85.1	104.8	10.2	98
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning	7.64	186	56.4	87.2	11.7	105
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning	7.44	147	43	53.8	10.8	96.2
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning	8.1	263	88.6	127.6	12.3	101

Date Taken	Time Taken	NGR	Location	BOD (ATU) mg/L	TOC mg/L	DOC<0.45µm mg/L	Ammonia as N mg/L	NonionNH3 mg/L	TON as N mg/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	3.2	5.91	5.8	0.041	< .0005	0.402
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning	4.5	11.17	10.02	0.159	0.0006	0.33
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	1.6	4.53	4.13	0.061	0.002	0.472
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	1.7	5.55	5.54 < .04		< .0006	0.275
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	1.6	6.61	6.61	0.05	< .0005	0.977
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	1.7	12.61	12.38 < .04		< .0006	0.77
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	1.5	12.6	12.36 < .04		< .0005	0.332
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	1.7	6.59	6.43 < .04		< .0008	0.676
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	1.5	10.7	10.84 < .04		< .0005	0.299
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	1.6	6.69	6.79 < .04		< .0006	0.448
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning	1.2	8.81	9.09 < .04		< .0005	0.578
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning	2.7	7.83	7.67	0.177	< .0005	0.868
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	1.2	4.1	4.17 < .04		< .0005	0.83
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning	1.1	4.87	4.89 < .04		< .0006	0.742
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning		4.53	4.49 < .04		< .0014	0.133
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning				0.062	0.0013	0.696
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning						
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning		13.61	13.5 < .04		< .0007	0.269
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning	1		< .04			0.282
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	1.8	3.35	3.24 < .04		< .0005	0.47
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.9	7.81	7.64 < .04		< .0005	1.04
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning		5.839		0.11	< .0005	1.09
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning			6.26 < .04		< .0005	1.02
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning			4.77	0.041	< .0005	0.603
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning			9.13	0.045		0.547
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning		10.126	9.98	0.05	< .0005	0.566
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning		5.405	5.35 < .04		< .0009	0.602
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning		6.876	6.78 < .04		< .0011	0.602
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning		6.655	< .04		< .0029	0.191
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning		8.16	8.17 < .04		< .0008	1.56
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning			9.31			0.494
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning			< .04		< .0005	0.307
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning			6.49	0.051	0.0009	0.64

Date Taken	Time Taken	NGR	Location	Nitrite as N mg/L	Nitrate as N mg/L	TN mg/L	o-Phos as P mg/L	Tot P as P mg/L	Chloride mg/L	
21-JAN-2009		1050 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.392	0.57	0.026	0.028	19.7
26-MAR-2009		1015 NS 30658 42559	River Garnock @ Kilwinning		0.041	0.289	0.86	0.016	0.045	14.5
23-APR-2009		1055 NS 30658 42559	River Garnock @ Kilwinning		0.015	0.457	0.65	0.03	0.034	24.9
25-MAY-2009		1045 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.265	0.3	0.014	0.014	18.4
19-JUN-2009		1040 NS 30658 42559	River Garnock @ Kilwinning		0.013	0.964	1.22	0.018	0.017	15.8
30-JUL-2009		1045 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.76	1.29	0.044	0.044	14.3
27-AUG-2009		1055 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.322	1.16	0.05	0.053	9.9
18-SEP-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.666	0.92	0.044	0.044	16.4
01-OCT-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.289	0.69	0.033	0.052	11.1
20-OCT-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.438	0.91	0.033	0.034	16.6
05-NOV-2009		1145 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.568	0.79	0.058	0.069	12.4
18-JAN-2010		1030 NS 30658 42559	River Garnock @ Kilwinning		0.022	0.846	1.49	0.114	0.14	21.8
05-MAR-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.82	1.14	0.017		26.5
14-APR-2010		1115 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.732	1.07	0.027		21.8
13-MAY-2010		1110 NS 30658 42559	River Garnock @ Kilwinning				0.48	0.012	0.03	
10-JUN-2010		1110 NS 30658 42559	River Garnock @ Kilwinning		0.016	0.68	1.02	0.014	0.045	28.2
08-JUL-2010		1100 NS 30658 42559	River Garnock @ Kilwinning				1.22		0.041	
20-AUG-2010		1130 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.259	0.7	0.032	0.042	14.7
09-SEP-2010		1135 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.272	0.88	< .015	0.047	14
05-OCT-2010		1100 NS 30658 42559	River Garnock @ Kilwinning		0.015	0.455	1.21	0.058	0.102	8.87
01-NOV-2010		1100 NS 30658 42559	River Garnock @ Kilwinning		0.01	1.03	1.38	0.036	0.034	15.3
07-JAN-2011		1055 NS 30658 42559	River Garnock @ Kilwinning		0.015	1.08	1.51	0.029	0.045	28.5
04-FEB-2011		1000 NS 30658 42559	River Garnock @ Kilwinning	< .01		1.01	1.39		0.051	27.2
08-MAR-2011		1105 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.593	0.98		0.031	24.8
07-APR-2011		1050 NS 30658 42559	River Garnock @ Kilwinning		0.016	0.531	1.4	0.045		11.5
23-MAY-2011		945 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.556	1.23	0.023	0.192	11.4
03-JUN-2011		929 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.592	0.96	0.019	0.039	16.5
01-JUL-2011		905 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.592	0.9	0.023	0.048	17.7
15-JUL-2011		905 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.181	0.59	< .015	0.04	20.3
26-AUG-2011		915 NS 30658 42559	River Garnock @ Kilwinning	< .01		1.55	1.88	0.023	0.052	17.6
15-SEP-2011		925 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.484	1.12	0.018	0.054	14.6
06-OCT-2011		920 NS 30658 42559	River Garnock @ Kilwinning	< .01		0.297	1.15	0.031		13.1
17-NOV-2011		920 NS 30658 42559	River Garnock @ Kilwinning	< .007		0.633	1.08	0.021	0.047	16.6

Date Taken	Time Taken	NGR	Location	Sulphate as SO4 mg/L	Silicate as SiO2 mg/L	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	Fe mg/L
21-JAN-2009		1050 NS 30658 42559	River Garnock @ Kilwinning	10.9	4.54	10.7	1.52	13.2	2.5	0.455
26-MAR-2009		1015 NS 30658 42559	River Garnock @ Kilwinning	20.3	2.72	7.9	2.04	8.5	2.04	4.3
23-APR-2009		1055 NS 30658 42559	River Garnock @ Kilwinning	24.2	2.8	18	2.3	37.9	7.2	0.51
25-MAY-2009		1045 NS 30658 42559	River Garnock @ Kilwinning	15.4	5.01	13.4	1.94	26.3	5.06	0.374
19-JUN-2009		1040 NS 30658 42559	River Garnock @ Kilwinning	15.3	4.51	11.4	2.02	20.9	3.67	0.47
30-JUL-2009		1045 NS 30658 42559	River Garnock @ Kilwinning	19.6	5.71	10.1	1.92	22.6	3.68	0.677
27-AUG-2009		1055 NS 30658 42559	River Garnock @ Kilwinning	15.4	6.29	8.06	1.61	16.6	2.84	0.706
18-SEP-2009		1110 NS 30658 42559	River Garnock @ Kilwinning			13.6	2.52	33.5	6.67	0.737
01-OCT-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	13.3	5.05	7.69	1.28	14.5	2.76	0.54
20-OCT-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	19.5	8.36	12	2.41	26.8	5.2	0.593
05-NOV-2009		1145 NS 30658 42559	River Garnock @ Kilwinning			9.03	2.17	20.2	3.5	0.707
18-JAN-2010		1030 NS 30658 42559	River Garnock @ Kilwinning			11.8	2.08	12	2.44	2.4
05-MAR-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	18.1	6.88	15.8	2.19	30.8	5.56	0.498
14-APR-2010		1115 NS 30658 42559	River Garnock @ Kilwinning	20.3	3.64	15.4	2.26	32.1	6.01	0.481
13-MAY-2010		1110 NS 30658 42559	River Garnock @ Kilwinning			19.6	2.72	36.6	7.66	0.447
10-JUN-2010		1110 NS 30658 42559	River Garnock @ Kilwinning	25.2	3.83					
08-JUL-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	25.1	3.06					
20-AUG-2010		1130 NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010		1135 NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	13.1	6.03	6.77	1.58	13	2.24	0.744
01-NOV-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	23.4	8.13	9.06	2.44	21.8	1.45	0.0878
07-JAN-2011		1055 NS 30658 42559	River Garnock @ Kilwinning	17.9	8.31					
04-FEB-2011		1000 NS 30658 42559	River Garnock @ Kilwinning	10.4	5.41					
08-MAR-2011		1105 NS 30658 42559	River Garnock @ Kilwinning	19.4	5.84					
07-APR-2011		1050 NS 30658 42559	River Garnock @ Kilwinning	9.48	4.56					
23-MAY-2011		945 NS 30658 42559	River Garnock @ Kilwinning	9.36	4.98					
03-JUN-2011		929 NS 30658 42559	River Garnock @ Kilwinning	17.6	5.58					
01-JUL-2011		905 NS 30658 42559	River Garnock @ Kilwinning	18.8	5.34					
15-JUL-2011		905 NS 30658 42559	River Garnock @ Kilwinning	23.9	0.995					
26-AUG-2011		915 NS 30658 42559	River Garnock @ Kilwinning	20.8	5.45					
15-SEP-2011		925 NS 30658 42559	River Garnock @ Kilwinning	12	6.37					
06-OCT-2011		920 NS 30658 42559	River Garnock @ Kilwinning	6.41	5.45					
17-NOV-2011		920 NS 30658 42559	River Garnock @ Kilwinning	17	7.92					

Date Taken	Time Taken	NGR	Location	Fe < 0.45µm mg/L	Al µg/L	Al < 0.45µm µg/L	Mn mg/L	Mn < 0.45µm mg/L	Cd µg/L	Cd < 0.45µm µg/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	0.161	195		33.6	0.031	0.007 < .07	< .1
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning	0.159	2280			0.238 < .005	0.09	
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	0.052	2470			0.033 < .005	0.724	
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	0.162	38.2		11.2	0.0193	0.0009 < .008	0.006
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	0.104	139		17.9	0.0296	0.0006	0.006
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning		169			0.0319	0.023	
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	0.349	213		72.9	0.0312	0.0045	0.03
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	0.398	91.6		32	0.025	0.017 < .0181	< .009
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning		109			0.0141	< .0181	< .009
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	0.19	103 < 7.02			0.0154	0.003 < .0181	< .009
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning	0.335	239		62.8	0.0342	0.0103	0.026 < .009
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning	0.177	1390		50.5	0.142	0.0032	0.067
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.231	66.9		16.9	0.0409	0.0185 < .0181	< .009
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning	0.211	76.1		19.1	0.0251	0.0185 < .018	0.009
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	0.132	41.6		19.3	0.0309	0.0086	0.019
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.323	350		80.7	0.0299	0.0027	0.02
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning		79.4		36.7	0.0046	0.0017	0.017
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning						0.008	
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning						0.028	0.01
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning						0.012	0.013
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning						0.027	0.014
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning							
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning							
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning							
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning							
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning							
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning							

Date Taken	Time Taken	NGR	Location	Cr µg/L	Cr < 0.45µm µg/L	Cu µg/L	Cu < 0.45µm µg/L	Ni µg/L	Ni < 0.45µm µg/L	Pb µg/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	2.24		0.332	1.98	1.24	1.3	1.07 0.74
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning	4.24			7.46		5.24	7.31
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	45.4			73.3		71.6	16.7
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	0.119		0.107	2.1	1.5	1.91	1.81 0.263
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning			0.111		2.49		1.36
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning	0.66			3.22		2.95	0.67
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	0.72	< .466		3.07	2.72	2.18	0.74
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< .256	< .466		2.06		2.35	0.372
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	0.326	< .466		1.93	1.52	1.4	1.25 0.411
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< .256	< .466		1.89	1.44	1.99	1.73 0.875
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning	0.698	< .466		2.61	1.95	2.55	2.24 0.869
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning	2.14	< .466		4.35	1.75	3.5	1.25 3.63
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< .256	< .466		1.46	1.12	2.26	1.96 0.458
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning	0.571		0.212	3.86	1.04	1.95	1.87
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	< .256		0.128	1.46	1.2	2.36	2.21 0.189
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.6	< .45		3.38	2.85	1.78	1.53 0.98
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.45	< .45		2.51	2.33	2.01	1.84 0.45
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning	0.34	< .45		3.62	3.18	1.58	1.47 0.5
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning	0.69	< .45		2.63	1.71	1.96	1.29 1.19
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	< .3	< .45		1.4	1.2	1.61	1.49 0.28
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning	0.54	< .45		3.07	2.33	2.07	1.49 1.15
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning							
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning							
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning							
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning							
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning							
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning							

Date Taken	Time Taken	NGR	Location	Pb < 0.45µm µg/L	Zn µg/L	Zn < 0.45µm µg/L	As µg/L	As < 0.45µm µg/L	V µg/L	V < 0.45µm µg/L	
21-JAN-2009		1050 NS 30658 42559	River Garnock @ Kilwinning	0.13	7.94		4.08	< 1.02	< .99	0.68	0.253
26-MAR-2009		1015 NS 30658 42559	River Garnock @ Kilwinning		26.7			< 1.02		6.41	
23-APR-2009		1055 NS 30658 42559	River Garnock @ Kilwinning		126			< 1.02		< .19	
25-MAY-2009		1045 NS 30658 42559	River Garnock @ Kilwinning	0.088	3.32			0.32		0.485	0.257
19-JUN-2009		1040 NS 30658 42559	River Garnock @ Kilwinning	0.057			9.71		0.279		0.463
30-JUL-2009		1045 NS 30658 42559	River Garnock @ Kilwinning		4.22			0.56		1.23	
27-AUG-2009		1055 NS 30658 42559	River Garnock @ Kilwinning	0.321	5.41	< 8.66		0.55	< .567	1.1	
18-SEP-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	0.172	4.54			< .33			
01-OCT-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	0.203	3.59	< 8.66		0.576	< .567		
20-OCT-2009		1110 NS 30658 42559	River Garnock @ Kilwinning	0.248	4.05	< 8.66		< .33	< .567		
05-NOV-2009		1145 NS 30658 42559	River Garnock @ Kilwinning	0.311	6.82	< 8.66		0.499	< .567		
18-JAN-2010		1030 NS 30658 42559	River Garnock @ Kilwinning	0.164	16.4	< 8.66		0.791	< .567		
05-MAR-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	0.093	4.22	< 8.66		< .33	< .567		
14-APR-2010		1115 NS 30658 42559	River Garnock @ Kilwinning		3.51			0.343	0.2		
13-MAY-2010		1110 NS 30658 42559	River Garnock @ Kilwinning	0.041	2.16	< 4.369		0.392			
10-JUN-2010		1110 NS 30658 42559	River Garnock @ Kilwinning								
08-JUL-2010		1100 NS 30658 42559	River Garnock @ Kilwinning								
20-AUG-2010		1130 NS 30658 42559	River Garnock @ Kilwinning								
09-SEP-2010		1135 NS 30658 42559	River Garnock @ Kilwinning								
05-OCT-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	0.41	5.58		3.04	< 1	< 1	1.18	0.71
01-NOV-2010		1100 NS 30658 42559	River Garnock @ Kilwinning	0.26	3.89		3.35	< 1	< 1	0.7	
07-JAN-2011		1055 NS 30658 42559	River Garnock @ Kilwinning	0.18	4.47			< 1	< 1	0.41	0.26
04-FEB-2011		1000 NS 30658 42559	River Garnock @ Kilwinning	0.19	7.57		2.53	< 1	< 1	1.25	0.38
08-MAR-2011		1105 NS 30658 42559	River Garnock @ Kilwinning	0.28	2.46		2.09	< 1	< 1	0.31	< .2
07-APR-2011		1050 NS 30658 42559	River Garnock @ Kilwinning	0.39	8.1		6.2	< 1	< 1	1.26	0.57
23-MAY-2011		945 NS 30658 42559	River Garnock @ Kilwinning								
03-JUN-2011		929 NS 30658 42559	River Garnock @ Kilwinning								
01-JUL-2011		905 NS 30658 42559	River Garnock @ Kilwinning								
15-JUL-2011		905 NS 30658 42559	River Garnock @ Kilwinning								
26-AUG-2011		915 NS 30658 42559	River Garnock @ Kilwinning								
15-SEP-2011		925 NS 30658 42559	River Garnock @ Kilwinning								
06-OCT-2011		920 NS 30658 42559	River Garnock @ Kilwinning								
17-NOV-2011		920 NS 30658 42559	River Garnock @ Kilwinning								

Date Taken	Time Taken	NGR	Location	Co µg/L	Co < 0.45µm µg/L	Hg µg/L	ACNE ng/L	ACNLE ng/L	Aldrin ng/L	Anthracene ng/L	Atrazine ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning			0.0037	< 6.04	< 4.6	< .1	< 3.9	< 10
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning			0.014					
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning			< .003			< .1		< 10
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning			< .003					
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning			< .003	< 6.4	< 4.9		8.12	244
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning								
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning			0.035					
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning			< .003	< 6.04	< 4.6		< 3.9	< 10
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning			0.0055					
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning			0.0033					
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning			0.006					
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning			0.0103					
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning			< .003					
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning			< .003					
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning			< .003	< 6.04	< 4.6		< 3.9	
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning								
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning			0.0113	< 6.04	< 4.6		< 3.9	
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning								
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning								
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.22	0.14		12.5	< 4.6		< 3.9	
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	0.24							
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning	0.17	< .1						
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning	0.47	0.16						
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	0.58	< .1		< 6.04	< 4.7		< 3.9	
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning	0.42	< .1						
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning								
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning								
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning								
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning								
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning				< 6.04	< 4.7		< 3.6	
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning								
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning								
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning				< 4.7			< 3.6	

Date Taken	Time Taken	NGR	Location	Azinphos-e ng/L	Azinphos-Me ng/L	BGHIP ng/L	BAA ng/L	BAP ng/L	BBFLU ng/L	BKF ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	< 10	< 17	< 14.3	< 6.31	< 13.62	< 11.1	< 12.94
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning							
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	< 10	< 17					
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	< 10	< 17	< 15.1	< 6.6	< 14.4	< 11.7	< 13.7
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning							
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< 10	< 17	< 14.3	< 6.31	< 13.62	< 11.1	< 13
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning							
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning							
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning							
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning			< 14.3	< 6.31	< 13.62	< 11.1	< 13
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning			< 14.3	< 6.31	< 13.62	< 11.1	< 13
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning			< 14.3	< 6.31	< 13.62	< 11.1	< 13
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning							
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning							
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning			< 14.3	< 6.31	< 13.62	< 11.1	< 13
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning							
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning							
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning							
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning			< 14.3		< 13.62	< 11.1	< 13
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning							
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning							
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning				< 6.31			< 13

Date Taken	Time Taken	NGR	Location	Benzo(B+K)Fluora ng/L	BBPHTH ng/L	Chlfenvinph ng/L	HCB ng/L	Chrysene ng/L	DDD - pp ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning		< 6	< 9	0.3	< 7.2	< .1
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning						
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning		< 6	< 9	< .1		< .1
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning						
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	< 13.7	< 6	< 9		< 7.6	
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning						
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning						
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< 13	< 6	< 9		< 7.2	
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning						
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning						
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning						
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning						
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning						
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning						
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	< 13				< 7.2	
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning						
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 13	< 6			< 7.2	
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning						
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning						
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 13					
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning						
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning						
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning						
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	< 13	< 6			< 7.17	
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning						
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning						
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning						
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning						
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning						
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning	< 13				< 7	
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning						
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning						
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning		< 6			< 7	

DDE - op
ng/L
< .1

< .1

Date Taken	Time Taken	NGR	Location	DDT - pp ng/L	Total DDT ng/L	Diazinon ng/L	Diben-anth ng/L	Dichlorvos ng/L	Dieldrin ng/L	Drins - Total ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	< .1	< .1	< 12	< 6.5	< 7	0.1	0.1
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning							
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning	< .1	< .1	< 12		< 7	0.2	0.2
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning			< 12	< 6.8	< 7		
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning							
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning			< 12	< 6.5	< 7		
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning							
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning							
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning							
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning				< 6.5			
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning				< 6.5			
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning				< 6.5			
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning							
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning							
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning				< 6.5			
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning							
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning							
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning							
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning				< 6.5			
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning							
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning							
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning				< 6.5			

Date Taken	Time Taken	NGR	Location	DiethHexPhthal ng/L	DBPHTH ng/L	DOPHTH ng/L	a-Endosulfn ng/L	Endrin ng/L	Fenitroth'n ng/L	Fenthion ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning			< 2	< .1	< .1	< 5	< 7
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning							
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning		207	< 2	< .1	< .1	< 5	< 7
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	115		< 2			< 5	< 7
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning							
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< 6		< 2			< 5	< 7
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning							
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning							
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning							
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	199	794	< 2				
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	227		< 2				
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning							
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning							
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning							
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning							
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning							
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning							
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning							
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning							
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning							
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning	< 6	< 3	< 2				

Date Taken	Time Taken	NGR	Location	Fluoranthene ng/L	Fluorene ng/L	a-HCH ng/L	b-HCH ng/L	g-HCH ng/L	HCH-total ng/L	Indenopyrene ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	< 9.41	< 9.5	< .1	< .1	0.3	0.3	< 16.23
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning							
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning			< .1	< .1	1.2	1.2	
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	< 9.9	< 10					< 17.1
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning							
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning							
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< 9.41	< 9.5					< 16.2
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning							
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning							
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning							
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning							
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning		19.5	< 9.5				< 16.2
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning							
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 9.41						< 16.2
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning							
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning							
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 9.41	< 9.5					< 16.2
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning							
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning							
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning							
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	< 9.41	< 9.5					< 16.2
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning							
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning							
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning							
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning							
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning	< 9.41	< 9.5					< 16.2
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning							
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning							
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning	< 9.41						< 16.2

Date Taken	Time Taken	NGR	Location	Ben(ghi)+Ind(123 ng/L	Isodrin ng/L	Malathion ng/L	Naphthalene ng/L	Parathion ng/L	M-Parathion ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning		< .1	< 9	< 8.74	< 6	< 10
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning						
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning		< .1	< 9		< 6	< 10
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning						
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	< 17.1		< 9		16 < 6	< 10
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning						
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning						
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< 16.2		< 9	< 8.8	< 6	< 10
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning						
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning						
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning						
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning						
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning						
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning						
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	< 16.2			< 8.8		
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning						
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 16.2			< 8.8		
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning						
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning						
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 16.2			< 8.8		
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning						
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning						
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning						
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning	< 16.2				14	
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning						
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning						
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning						
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning						
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning						
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning	< 16.2			13.2		
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning						
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning						
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning						

Date Taken	Time Taken	NGR	Location	Phenanthrene ng/L	Propetamph ng/L	Pyrene ng/L	Simazine ng/L	Trifluralin ng/L
21-JAN-2009	1050	NS 30658 42559	River Garnock @ Kilwinning	< 4.3	< 9	< 16.6	< 12	0.3
26-MAR-2009	1015	NS 30658 42559	River Garnock @ Kilwinning					
23-APR-2009	1055	NS 30658 42559	River Garnock @ Kilwinning		< 9		< 12	0.2
25-MAY-2009	1045	NS 30658 42559	River Garnock @ Kilwinning					
19-JUN-2009	1040	NS 30658 42559	River Garnock @ Kilwinning	< 4.5	< 9	< 17.5	< 12	
30-JUL-2009	1045	NS 30658 42559	River Garnock @ Kilwinning					
27-AUG-2009	1055	NS 30658 42559	River Garnock @ Kilwinning					
18-SEP-2009	1110	NS 30658 42559	River Garnock @ Kilwinning	< 4.3	< 9	< 16.6	< 12	
01-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning					
20-OCT-2009	1110	NS 30658 42559	River Garnock @ Kilwinning					
05-NOV-2009	1145	NS 30658 42559	River Garnock @ Kilwinning					
18-JAN-2010	1030	NS 30658 42559	River Garnock @ Kilwinning					
05-MAR-2010	1100	NS 30658 42559	River Garnock @ Kilwinning					
14-APR-2010	1115	NS 30658 42559	River Garnock @ Kilwinning					
13-MAY-2010	1110	NS 30658 42559	River Garnock @ Kilwinning	< 4.3		< 16.6		
10-JUN-2010	1110	NS 30658 42559	River Garnock @ Kilwinning					
08-JUL-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 4.3		< 16.6		
20-AUG-2010	1130	NS 30658 42559	River Garnock @ Kilwinning					
09-SEP-2010	1135	NS 30658 42559	River Garnock @ Kilwinning					
05-OCT-2010	1100	NS 30658 42559	River Garnock @ Kilwinning	< 4.3		< 16.6		
01-NOV-2010	1100	NS 30658 42559	River Garnock @ Kilwinning					
07-JAN-2011	1055	NS 30658 42559	River Garnock @ Kilwinning					
04-FEB-2011	1000	NS 30658 42559	River Garnock @ Kilwinning					
08-MAR-2011	1105	NS 30658 42559	River Garnock @ Kilwinning		9.9	< 16.6		
07-APR-2011	1050	NS 30658 42559	River Garnock @ Kilwinning					
23-MAY-2011	945	NS 30658 42559	River Garnock @ Kilwinning					
03-JUN-2011	929	NS 30658 42559	River Garnock @ Kilwinning					
01-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning					
15-JUL-2011	905	NS 30658 42559	River Garnock @ Kilwinning					
26-AUG-2011	915	NS 30658 42559	River Garnock @ Kilwinning	< 4.3		< 16.6		
15-SEP-2011	925	NS 30658 42559	River Garnock @ Kilwinning					
06-OCT-2011	920	NS 30658 42559	River Garnock @ Kilwinning					
17-NOV-2011	920	NS 30658 42559	River Garnock @ Kilwinning			< 16.6		

A737 Dalry Bypass
Standard Chemistry Data 2008-2011
NGR 230365,648917 2Km Radius

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	SampleTemp °C	SuspSolids mg/L	pH pH units	ElecCond-25 µS/cm
28-JAN-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	7	< 2	7.53	189
21-FEB-2008	940	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	6	9.4	7.62	454
18-APR-2008	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	7	3.2	7.72	235
01-MAY-2008	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	9	13	7.56	195
27-MAY-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	11	3	7.96	329
24-JUN-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	13	3.6	7.69	261
23-JUL-2008	840	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	16	3.1	7.9	264
26-AUG-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	14	4.3	7.36	132
25-SEP-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	12	< 2	7.84	236
02-OCT-2008	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	9	< 2	7.5	203
28-OCT-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	7	4.5	7.65	167
25-NOV-2008	1050	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	4	< 2	7.8	205
21-JAN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	4	8.3	7.31	124
06-MAR-2009	1045	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	6	3.2	7.54	163
26-MAR-2009	925	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	7	48	7.47	107
23-APR-2009	1017	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	10	4	8.13	308
25-MAY-2009	1010	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	12	4.3	7.87	227
19-JUN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	13	6	7.93	284
30-JUL-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	14	4.5	7.77	148
27-AUG-2009	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	16	5.8	7.49	117
18-SEP-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	12	3	7.68	146
01-OCT-2009	1025	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	10	< 2	7.9	165
20-OCT-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	9	< 2	7.71	149
05-NOV-2009	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	8	16	7.54	128
18-JAN-2010	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	3	20	7.17	108
05-FEB-2010	1055	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	3	4.1	7.48	161
05-MAR-2010	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	3	< 2	7.72	181
14-APR-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	8	2.4	7.79	200
13-MAY-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	9		7.97	208
10-JUN-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	13		7.83	254

A737 Dalry Bypass
Standard Chemistry Data 2008-2011
NGR 230365,648917 2Km Radius

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	SampleTemp °C	SuspSolids mg/L	pH units	ElecCond-25 µS/cm
08-JUL-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	14		7.77	159
20-JUL-2010	1140	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	15		7.45	133
20-AUG-2010	1055	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	14		7.67	118
09-SEP-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	14 < 2		7.71	142
05-OCT-2010	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	12	6.2	7.55	116
01-NOV-2010	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	7	2	7.51	151
07-JAN-2011	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0		7.57	162
04-FEB-2011	920	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	4		7.46	169
08-MAR-2011	1025	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	5		7.7	171
07-APR-2011	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	9			
23-MAY-2011	925	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	10.5		7.14	123
03-JUN-2011	912	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	13.5		7.77	182
01-JUL-2011	850	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	13		7.9	194
15-JUL-2011	850	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	16.2		7.95	199
26-AUG-2011	900	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	13.4		7.82	163
15-SEP-2011	910	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	10.1	3.3	7.65	145
06-OCT-2011	905	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	10.5	14	7.42	126
17-NOV-2011	905	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	7.5	5.8	8	212

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	Alk as CaCO3 mg/L	Hardness mg/L	O2 - DO mg/L	O2 -%sat %	BOD (ATU) mg/L
28-JAN-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	53.5	70.2	11.8	97.2	0.9
21-FEB-2008	940	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	71.8	106	11.6	93.2	3.1
18-APR-2008	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	65.6	81.1	11.4	93.9	1.5
01-MAY-2008	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	56.2	49.6			5.1
27-MAY-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	107	131	13.2	120	2.1
24-JUN-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	65.5	99.8	11.3	107	2.2
23-JUL-2008	840	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	81.6	111	11.7	119	1.4
26-AUG-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	37.7	47.1	10.3	100	0.8
25-SEP-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	96.2		10.9	101	1
02-OCT-2008	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	66.7	69.7	11.6	100	2
28-OCT-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	53.7	60.4	12.6	104	1.4
25-NOV-2008	1050	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	67.4	72.5	14.2	108	1.4
21-JAN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	29.9	44.9			2
06-MAR-2009	1045	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	42.6	74.4	12.4	99.6	1.9
26-MAR-2009	925	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	24.3	30.3	11.8	97.2	5.1
23-APR-2009	1017	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	99.1	124	11.1	98.4	1.5
25-MAY-2009	1010	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	79.1	100	11.1	103	2.2
19-JUN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	84.6	109	11.6	110	1.7
30-JUL-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	43.5	43	9.7	94.2	1
27-AUG-2009	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	36.6	43.1	8.1	82.1	1.4
18-SEP-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	48	52.4	10.9	101	1.7
01-OCT-2009	1025	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	55	62	11.9	105	1.2
20-OCT-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	51.2	62.9	11.3	97.8	1.3
05-NOV-2009	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	40.3	45.9	11.2	94.6	1.7
18-JAN-2010	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	22.2	37.6	13.7	102	2.2
05-FEB-2010	1055	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	43.9	62.2	13	96.6	1.9
05-MAR-2010	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	53.7	76	13.7	102	2.1
14-APR-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	57.2	68	11.7	98.8	1.2
13-MAY-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	62.5		13.2	114	
10-JUN-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	68.7		11	104	

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	Alk as CaCO3 mg/L	Hardness mg/L	O2 - DO mg/L	O2 -%sat %	BOD (ATU) mg/L
08-JUL-2010		1030 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	46		10.9	106	
20-JUL-2010		1140 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	35.7	51.9	9.8	97.3	
20-AUG-2010		1055 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	32.7	40.9	10.2	99.1	
09-SEP-2010		1030 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	42.1	54	10.9	106	1.1
05-OCT-2010		1020 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	32	44.2	10.8	100	1.5
01-NOV-2010		1015 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	46.2	60.7	12.7	105	0.9
07-JAN-2011		1015 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	41.1	56.4	14.3	97.7	
04-FEB-2011		920 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	34.5	47.9	12.7	96.9	
08-MAR-2011		1025 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	51.9	59	13	102	
07-APR-2011		1015 Caaf Water @ Lynn Bridge	134376	NS 28689 48625			11.6	100	
23-MAY-2011		925 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	33		10.6	95.1	
03-JUN-2011		912 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	57		10.6	102	
01-JUL-2011		850 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	59.1		10.5	99.7	
15-JUL-2011		850 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	58.7		9.8	99.8	
26-AUG-2011		900 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	53.6		10.5	101	
15-SEP-2011		910 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	44.8		11.7	104	
06-OCT-2011		905 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	34.9		10.8	96.9	
17-NOV-2011		905 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	67		12	100	

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	Ammonia as N mg/L	NonionNH3 mg/L	TON as N mg/L	Nitrite as N mg/L
28-JAN-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.081	< .0005	0.6	0.039
21-FEB-2008	940	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.513	0.0029	0.918	0.024
18-APR-2008	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.455	< .01
01-MAY-2008	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.572	0.0036	0.449	0.018
27-MAY-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0007	0.652	< .01
24-JUN-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	1.48	0.134
23-JUL-2008	840	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0009	0.386	< .01
26-AUG-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.095	0.0005	0.489	0.04
25-SEP-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.619	0.019
02-OCT-2008	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.46	0.013
28-OCT-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.359	0.018
25-NOV-2008	1050	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.292	< .01
21-JAN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.302	< .01
06-MAR-2009	1045	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.355	< .01
26-MAR-2009	925	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.158	0.0007	0.725	0.029
23-APR-2009	1017	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.054	0.0013	1.28	0.029
25-MAY-2009	1010	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.455	< .01
19-JUN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.046	0.0009	1.27	0.052
30-JUL-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.212	< .01
27-AUG-2009	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04		0.237	< .01
18-SEP-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.31	< .01
01-OCT-2009	1025	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.296	< .01
20-OCT-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.29	< .01
05-NOV-2009	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.075	< .0005	0.381	0.012
18-JAN-2010	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.109	< .0005	0.494	0.01
05-FEB-2010	1055	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.188	0.0006	0.508	< .01
05-MAR-2010	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.543	< .01
14-APR-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.604	0.011
13-MAY-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.266	
10-JUN-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625				

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	Ammonia as N mg/L	NonionNH3 mg/L	TON as N mg/L	Nitrite as N mg/L
08-JUL-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625				
20-JUL-2010	1140	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.04 < .0005	0.422	0.02
20-AUG-2010	1055	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.13 < .01	
09-SEP-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04		0.197	0.01
05-OCT-2010	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.354	0.015
01-NOV-2010	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0005	0.525 < .01	
07-JAN-2011	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.066 < .0005	0.729	0.01
04-FEB-2011	920	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.1 < .0005	0.622 < .01	
08-MAR-2011	1025	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.086 0.0005	0.538	0.011
07-APR-2011	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04		0.333	0.015
23-MAY-2011	925	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.155 < .0005	0.824 < .01	
03-JUN-2011	912	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.501	0.015
01-JUL-2011	850	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0007	0.45	0.018
15-JUL-2011	850	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .001	0.276	0.014
26-AUG-2011	900	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	< .04	< .0006	0.38 < .01	
15-SEP-2011	910	Caaf Water @ Lynn Bridge	134376	NS 28689 48625			0.307 < .01	
06-OCT-2011	905	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.068 < .0005	0.227 < .01	
17-NOV-2011	905	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.209 0.0032	0.629	0.023

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	Nitrate as N mg/L	o-Phos as P mg/L	Chloride mg/L
28-JAN-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.561	0.036	23.2
21-FEB-2008	940	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.894	0.092	90.5
18-APR-2008	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.445	0.043	27.3
01-MAY-2008	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.431	0.206	26.3
27-MAY-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.642	0.027	32.2
24-JUN-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	1.35	0.081	29.2
23-JUL-2008	840	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.376	0.047	25.5
26-AUG-2008	950	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.449	0.095	20.4
25-SEP-2008	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.6	0.054	18.3
02-OCT-2008	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.447	0.181	17.9
28-OCT-2008	1040	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.341	0.049	13.2
25-NOV-2008	1050	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.282	0.037	20.6
21-JAN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.292	0.023	18.7
06-MAR-2009	1045	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.345	0.025	20
26-MAR-2009	925	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.696	0.023	15.6
23-APR-2009	1017	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	1.25	0.035	26.7
25-MAY-2009	1010	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.445	0.054	19.5
19-JUN-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	1.22	0.077	26.9
30-JUL-2009	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.202	0.025	13.5
27-AUG-2009	1020	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.227	0.046	10.7
18-SEP-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.3	0.043	12.6
01-OCT-2009	1025	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.286	0.052	13.3
20-OCT-2009	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.28	0.029	13.4
05-NOV-2009	1110	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.369	0.087	12.2
18-JAN-2010	1000	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.484	0.057	16.9
05-FEB-2010	1055	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.498	0.017	20.3
05-MAR-2010	1015	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.533	0.013	19.1
14-APR-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.593	0.023	18.4
13-MAY-2010	1035	Caaf Water @ Lynn Bridge	134376	NS 28689 48625		0.011	
10-JUN-2010	1030	Caaf Water @ Lynn Bridge	134376	NS 28689 48625			

Date Sampled	Time Sampled	Location Description	Location Code	Nat Grid Ref	Nitrate as N mg/L	o-Phos as P mg/L	Chloride mg/L
08-JUL-2010		1030 Caaf Water @ Lynn Bridge	134376	NS 28689 48625			
20-JUL-2010		1140 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.402	0.084	13.7
20-AUG-2010		1055 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.12	0.039	10.7
09-SEP-2010		1030 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.187	< .015	14
05-OCT-2010		1020 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.339	0.046	10.3
01-NOV-2010		1015 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.515	0.038	13.3
07-JAN-2011		1015 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.719	0.021	19.2
04-FEB-2011		920 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.612	0.096	26.5
08-MAR-2011		1025 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.527	0.067	18
07-APR-2011		1015 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.318	0.027	12.3
23-MAY-2011		925 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.814	0.055	10.9
03-JUN-2011		912 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.486	0.019	15
01-JUL-2011		850 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.432	0.034	15.4
15-JUL-2011		850 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.262	0.03	15.6
26-AUG-2011		900 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.37	0.019	13.3
15-SEP-2011		910 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.297	0.017	13.5
06-OCT-2011		905 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.217	0.031	13.5
17-NOV-2011		905 Caaf Water @ Lynn Bridge	134376	NS 28689 48625	0.606	0.037	18

Appendix 16.5

SEPA Water Quality data

Appendix 16.6

Water risk assessment

Water Risk Assessment
(Prepared following completion of Stage 3 SI)

Activity		Source	Pathway	Receptor	Potential problem	No risk or Risk management
Construction of road in cutting below Blair Road	SCHEME CONSTRUCTION	Groundwater	Temporary drainage system	Unnamed tributary of River Garnock	Flood risk - Extensive dewatering of excavation if artesian groundwater encountered – risk of downstream flooding	Negligible risk of artesian groundwater due to remaining approx. 10m clay cap (after cut) providing effective containment of groundwater. Seepage through boulder clay will be dealt with by conventional dewatering
					Pollution - Surface water pollution if groundwater contaminated	Elevated levels of naturally occurring iron, manganese and aluminium present in groundwater compared with surface water content. Pre-treatment of the intercepted seepage water may be required before discharge
				Groundwater / surface water features	Water features - Temporary lowering of groundwater table impacting on ground and surface water	Negligible risk as anticipated groundwater flows are small (local seepage through boulder clay only). Low permeability boulder clay will result in small radius of influence
		Materials – concrete / cement grout	Spillage	Groundwater/surface water	Pollution - Groundwater / surface water pollution	Negligible risk due to works undertaken well above the groundwater table / follow published SEPA guidance
	SCHEME OPERATION	Groundwater	Road drainage system / SuDS	Unnamed tributary of River Garnock / other water features	Flood risk - Insufficient drainage provided to intercept high groundwater flows	Permanent seepage (varying flows but not significant) through boulder clay anticipated but no designated groundwater drainage required. The new road drainage will be designed to intercept any groundwater seepage.
					Water Features - Permanent lowering of groundwater table impacting on surface water features fed by groundwater	Negligible risk as anticipated groundwater flows are small (seepage only)
					Pollution - Surface water pollution if groundwater contaminated	Negligible risk as the intercepted groundwater seepage will drain via new road drainage and SuDS prior to discharge to watercourse.

Activity		Source	Pathway	Receptor	Potential problem	No risk or Risk management
Grouting of covered mine workings	SCHEME CONSTRUCTION	Redundant mineworkings (stabilisation by grout)	Shafts, roadways, faults	Groundwater/ surface water features	Pollution - Groundwater/ surface water pollution	<u>Area 1</u> (Highfield Limestone): potential risk of groundwater pollution due to grouting below groundwater level encountered during SI. However, void is isolated and gravel will be used to fill voids thus risk of contamination is minimised. <u>Area 2</u> (Smithy Coal): negligible risk (majority BHs were dry during SI) due to the affected area being isolated. Dense grout will be used to fill voids <u>Area 3</u> (Borestone Coal): located close to the Coalheughglen Burn and potentially draining to the R. Garnock Day Level. Contamination risk is low due to the grouting being at a much higher level than the Day Level. Further SI will establish full extent of grouting. Close monitoring of Day Level and nearby watercourses will be required.
					Flooding / drainage – Interference with groundwater pathways / changing flow patterns	<u>Area 1</u> (Highfield Limestone) – low risk due to utilising gravel to fill voids (maintain flow path) – isolated void <u>Area 2</u> (Smithy Coal) - negligible risk as the proposed works will be undertaken above the groundwater table (majority of BHs were dry during SI) and the grouting zone will be isolated. <u>Area 3</u> (Borestone Coal) – a low risk of pathways blocking during grouting in this area (no groundwater encountered in BH during SI). Further SI will establish full extent of grouting. Close monitoring of the Day Level discharge and nearby water features may be required.
	SCHEME OPERATION	Redundant mineworkings (stabilisation by grout)	Shafts, roadways, faults	Groundwater/ surface water features	Flooding / drainage – Interference with groundwater pathways / changing flow patterns	Low risk but monitoring of nearby water features should continue during scheme operation and mitigation measures developed as appropriate.

Activity		Source	Pathway	Receptor	Potential problem	No risk or Risk management
Construction of viaduct foundations	SCHEME CONSTRUCTION	Groundwater	Dewatering / temporary drainage	River Garnock	Flooding - due to high rates of dewatering during pile construction (artesian groundwater present)	Flow rates will be confirmed but it is anticipated that it will be no more than 2000m ³ /d. Considering the flows in the River Garnock the flood risk is considered negligible.
					Pollution - due to discharge of groundwater arisings	Elevated levels of naturally occurring iron, manganese and aluminium in groundwater when compared against surface water content. Treatment may be required prior to discharge to the River Garnock. However, if viable, any construction groundwater arisings should be returned to ground.
		Groundwater	Dewatering / temporary drainage	Groundwater / surface water features	Water Features - lowering of groundwater table impacting on surface water features fed by groundwater	No extensive dewatering (artesian water) is anticipated due to adoption of the following construction methods: - provision of permanently cased piles founded in the rock below Upper Linn Limestone, and - construction of piles with the bores full of high density or pressurised drilling fluids Normal construction dewatering only is therefore envisaged
		Materials – concrete / cement grout	Spillage	Groundwater/ surface water	Pollution / contamination – River Garnock	Selected construction method should minimise the risk of groundwater pollution – follow published SEPA guidance
	SCHEME OPERATION	Groundwater	Permanent drainage system	River Garnock	Flooding – River Garnock downstream	Seepage flows will be minimal thus the flood risk to the River Garnock is negligible.
					Pollution - River Garnock	Seepage flows will be minimal thus considering available dilution within the River Garnock the risk of pollution is considered as negligible

Annual Average Concentration			Soluble - Acute Impact	Zinc	Sediment - Chronic Impact		
	Copper	Zinc	Copper	Zinc	Sediment deposition for this site is judged as:		
Step 2	0.01	0.05	ug/l	Pass	Alert. Protected Area.	Accumulating?	No
Step 3	0.01	0.02	ug/l	Pass		Extensive?	No

Location Details

Road number	A737		HA Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)			
OS grid reference of assessment point (m)	Easting	229461	Northing	648321
OS grid reference of outfall structure (m)	Easting	229461	Northing	648321
Outfall number	PSD 1	List of outfalls in cumulative assessment		
Receiving watercourse	Caaf Water			
EA receiving water Detailed River Network ID			Assessor and affiliation	MLJ
Date of assessment	29/01/2013		Version of assessment	1.0
Notes				

Step 1 Runoff Quality

AADT	>10,000 and <50,000	Climatic region	Colder Wet	Rainfall site	Ardtalnaig (SAAR 1343.9mm)
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Step 2 River Impacts

Annual 95%ile river flow (m ³ /s)	0.104	(Enter zero in Annual 95%ile river flow box to assess Step 1 runoff quality only)	
Impermeable road area drained (ha)	1.59	Permeable area draining to outfall (ha)	0
Base Flow Index (BFI)	0.379	Is the discharge in or within 1 km upstream of a protected site for conservation?	Yes

For dissolved zinc only

Water hardness	Medium = 50-200 CaCO ₃ /l
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For sediment impact only

Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?	No	D
Tier 1 Estimated river width (m)	5	
Tier 2 Bed width (m)	7	
Manning's n	0.035	
Side slope (m/m)	0.666	
Long slope (m/m)	0.002	

Step 3 Mitigation

Brief description		Estimated effectiveness					
		Treatment for solubles (%)		Attenuation for solubles - restricted discharge rate (l/s)		Settlement of sediments (%)	
Existing measures		0	D	Unlimited	D	0	D
Proposed measures	1st filter trench/swale, 2nd detention basin	60		17		70	

Predict Impact
Show Detailed Results
Exit Tool

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

DETAILED RESULTS

In Runoff

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 1

Copper	Zinc
1	1
63.00	56.70
81	64

Copper	Zinc
1	1
18.00	20.60
24	27

(ug/l)	(ug/l)
21	92
42	184
23.36	67.70
45.65	147.58
54.99	194.62
96.36	372.28

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
1	1	1	1	1	1	1	1
83.80	112.10	2.20	48.30	111.00	48.30	23.00	91.00
97	128	7	59	127	59	32	101

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
197	315	3.5	16770	875	2355	245	515
331	1165	1	16068	2780	2667	170	752
733	2672	2	35481	6138	5890	376	1661
962	3572	3	70795	12247	11752	750	3313
1383	5637	4	89125	15419	14795	945	4171

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 2

Copper	Zinc
1	1
0	0
0	0
0	0
0	0

Copper	Zinc
0.5	0.5
0	0
0	0
0	0
0	0
0.01	0.05

(ug/l)	(ug/l)
21	92
42	184
0.05	0.17
0.11	0.28
0.25	0.63
0.83	3.53

Step 2

Velocity 0.25 m/s

DI -

% settlement needed - %

Tier 2 is used for the calculation

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 3

Copper	Zinc
1	1
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
0.5	0.5
0.00	0.00
0	0
0	0
0	0
0.01	0.02

(ug/l)	(ug/l)
21	92
42	184
0.02	0.07
0.04	0.11
0.10	0.25
0.33	1.40

DI -

Annual Average Concentration			Soluble - Acute Impact	Zinc	Sediment - Chronic Impact		
	Copper	Zinc	Copper	Zinc	Sediment deposition for this site is judged as:		
Step 2	0.80	2.41	Pass	Pass	Alert. Protected Area.	Accumulating?	No
Step 3	0.32	0.96				Extensive?	No

Location Details

Road number	A737		HA Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)			
OS grid reference of assessment point (m)	Easting	229831	Northing	648088
OS grid reference of outfall structure (m)	Easting	229831	Northing	648088
Outfall number	PSD 2	List of outfalls in cumulative assessment		
Receiving watercourse	River Garnock tributary			
EA receiving water Detailed River Network ID			Assessor and affiliation	MLJ
Date of assessment	29/01/2013		Version of assessment	1.0
Notes				

Step 1 Runoff Quality

AADT	>10,000 and <50,000	Climatic region	Colder Wet	Rainfall site	Ardtalnaig (SAAR 1343.9mm)
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Step 2 River Impacts

Annual 95%ile river flow (m ³ /s)	0.002	(Enter zero in Annual 95%ile river flow box to assess Step 1 runoff quality only)	
Impermeable road area drained (ha)	2.73	Permeable area draining to outfall (ha)	0
Base Flow Index (BFI)	0.342	Is the discharge in or within 1 km upstream of a protected site for conservation?	Yes

For dissolved zinc only

Water hardness	Medium = 50-200 CaCO ₃ /l
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For sediment impact only

Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?	No
Tier 1 Estimated river width (m)	5
Tier 2 Bed width (m)	1.45
Manning's n	0.05
Side slope (m/m)	0.5
Long slope (m/m)	0.015

Step 3 Mitigation

Brief description		Estimated effectiveness					
		Treatment for solubles (%)		Attenuation for solubles - restricted discharge rate (l/s)		Settlement of sediments (%)	
Existing measures		0	D	Unlimited	D	0	D
Proposed measures	1st filter trench, 2nd detention basin	60		29		70	

Predict Impact
Show Detailed Results
Exit Tool

Summary of predictions

Prediction of impact	Step1
	Step2
	Step3

Soluble - Acute Impact

Copper	Zinc

Sediment - Chronic Impact

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

DETAILED RESULTS

In Runoff

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 1

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 2

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 2

Velocity 0.15 m/s

Tier 2 is used for the calculation

DI -

% settlement needed - %

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 3

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

DI -

Annual Average Concentration				Soluble - Acute Impact		Zinc		Sediment - Chronic Impact			
	Copper	Zinc	ug/l	Copper	Zinc			Sediment deposition for this site is judged as:			
Step 2	1.11	3.38	ug/l	Pass	Pass	Alert. Protected Area.		Accumulating?	No	0.18	Low flow Vel m/s
Step 3	0.45	1.35	ug/l					Extensive?	No	-	Deposition Index

Location Details

Road number	A737		HA Area / DBFO number			
Assessment type	Non-cumulative assessment (single outfall)					
OS grid reference of assessment point (m)	Easting	230467	Northing	650068		
OS grid reference of outfall structure (m)	Easting	230467	Northing	650068		
Outfall number	PSD 3		List of outfalls in cumulative assessment			
Receiving watercourse	River Garnock tributary					
EA receiving water Detailed River Network ID			Assessor and affiliation		MLJ	
Date of assessment	29/01/2013		Version of assessment		1.0	
Notes						

Step 1 Runoff Quality

AADT	>10,000 and <50,000	Climatic region	Colder Wet	Rainfall site	Ardtnaig (SAAR 1343.9mm)
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Step 2 River Impacts

Annual 95%ile river flow (m ³ /s)	0.0011	(Enter zero in Annual 95%ile river flow box to assess Step 1 runoff quality only)			
Impermeable road area drained (ha)	2.45	Permeable area draining to outfall (ha)	0		
Base Flow Index (BFI)	0.342	Is the discharge in or within 1 km upstream of a protected site for conservation?	Yes		

For dissolved zinc only

Water hardness	Medium = 50-200 CaCO ₃ /l
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For sediment impact only

Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?	No	D
Tier 1 Estimated river width (m)	5	
Tier 2 Bed width (m)	0.95	
Manning's n	0.05	
Side slope (m/m)	0.666	
Long slope (m/m)	0.035	

Step 3 Mitigation

	Brief description	Estimated effectiveness					
		Treatment for solubles (%)		Attenuation for solubles - restricted discharge rate (l/s)		Settlement of sediments (%)	
Existing measures		0	D	Unlimited	D	0	D
Proposed measures	1st filter trench, 2nd detention basin	60		26		70	

Predict Impact
Show Detailed Results
Exit Tool

Summary of predictions

Prediction of Impact	Step1
	Step2
	Step3

Soluble - Acute Impact

Copper	Zinc

Sediment - Chronic Impact

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

DETAILED RESULTS

In Runoff

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 1

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer
 Annual average concentration (ug/l)

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 2

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 2

Velocity **0.18** m/s

Tier 2 is used for the calculation

DI **-**

% settlement needed **-** %

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer
 Annual average concentration (ug/l)

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 3

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

DI **-**

Annual Average Concentration			Soluble - Acute Impact		Zinc		Sediment - Chronic Impact			
	Copper	Zinc					Sediment deposition for this site is judged as:			
Step 2	0.42	1.26	ug/l	Pass	Pass	Alert. Protected Area.	Accumulating?	No	0.24	Low flow Vel m/s
Step 3	0.17	0.50	ug/l				Extensive?	No	-	Deposition Index

Location Details

Road number	NAC unclassified road		HA Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)			
OS grid reference of assessment point (m)	Easting	230457	Northing	649580
OS grid reference of outfall structure (m)	Easting	230457	Northing	649580
Outfall number	PSD 4	List of outfalls in cumulative assessment		
Receiving watercourse	Coalheughglen Burn			
EA receiving water Detailed River Network ID			Assessor and affiliation	MLJ
Date of assessment	29/01/2013		Version of assessment	1.0
Notes				

Step 1 Runoff Quality

AADT	>10,000 and <50,000	Climatic region	Colder Wet	Rainfall site	Ardtalnaig (SAAR 1343.9mm)
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Step 2 River Impacts

Annual 95%ile river flow (m ³ /s)	0.003	(Enter zero in Annual 95%ile river flow box to assess Step 1 runoff quality only)	
Impermeable road area drained (ha)	1.75	Permeable area draining to outfall (ha)	0
Base Flow Index (BFI)	0.342	Is the discharge in or within 1 km upstream of a protected site for conservation?	Yes ☐ No ☐

For dissolved zinc only

Water hardness	Medium = 50-200 CaCO ₃ /l
----------------	--------------------------------------

For sediment impact only

Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?	No ☐ D ☐
☒ Tier 1 Estimated river width (m)	5
☒ Tier 2 Bed width (m)	1.5
Manning's n	0.05
Side slope (m/m)	0.5
Long slope (m/m)	0.050

Step 3 Mitigation

Brief description		Estimated effectiveness					
		Treatment for solubles (%)		Attenuation for solubles - restricted discharge rate (l/s)		Settlement of sediments (%)	
Existing measures		0	D ☐	Unlimited	D ☐	0	D ☐
Proposed measures	1st filter trench, 2nd detention basin	60	☐	19	☐	70	☐

Predict Impact
Show Detailed Results
Exit Tool

Summary of predictions

Prediction of Impact	Step1
	Step2
	Step3

Soluble - Acute Impact

Copper	Zinc

Sediment - Chronic Impact

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

DETAILED RESULTS

In Runoff

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 1

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer
 Annual average concentration (ug/l)

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 2

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 2

Velocity **0.24** m/s

Tier 2 is used for the calculation

DI **-**

% settlement needed **-** %

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer
 Annual average concentration (ug/l)

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 3

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

DI **-**

Annual Average Concentration			Soluble - Acute Impact	Zinc	Sediment - Chronic Impact				
	Copper	Zinc	Copper	Zinc	Sediment deposition for this site is judged as:				
Step 2	0.69	2.09	ug/l	Pass	Alert. Protected Area.	Accumulating?	No	0.18	Low flow Vel m/s
Step 3	0.28	0.84	ug/l	Pass		Extensive?	No	-	Deposition Index

Location Details

Road number	A737		HA Area / DBFO number	
Assessment type	Non-cumulative assessment (single outfall)			
OS grid reference of assessment point (m)	Easting	231066	Northing	650296
OS grid reference of outfall structure (m)	Easting	231066	Northing	650296
Outfall number	PSD 5	List of outfalls in cumulative assessment		
Receiving watercourse	Coalheughglen Burn tributary			
EA receiving water Detailed River Network ID			Assessor and affiliation	MLJ
Date of assessment	10/05/2013		Version of assessment	2.0
Notes				

Step 1 Runoff Quality

AADT	>10,000 and <50,000	Climatic region	Colder Wet	Rainfall site	Ardtalnaig (SAAR 1343.9mm)
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Step 2 River Impacts

Annual 95%ile river flow (m ³ /s)	0.0013	(Enter zero in Annual 95%ile river flow box to assess Step 1 runoff quality only)	
Impermeable road area drained (ha)	1.46	Permeable area draining to outfall (ha)	0
Base Flow Index (BFI)	0.342	Is the discharge in or within 1 km upstream of a protected site for conservation?	Yes

For dissolved zinc only

Water hardness	Medium = 50-200 CaCO ₃ /l
----------------	--------------------------------------

For sediment impact only

Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?	No	D
Tier 1 Estimated river width (m)	5	
Tier 2 Bed width (m)	0.5	
Manning's n	0.05	
Side slope (m/m)	1	
Long slope (m/m)	0.0139	

Step 3 Mitigation

Brief description		Estimated effectiveness					
		Treatment for solubles (%)		Attenuation for solubles - restricted discharge rate (l/s)		Settlement of sediments (%)	
Existing measures		0	D	Unlimited	D	0	D
Proposed measures	1st filter trench, 2nd detention basin	60		16		70	

Predict Impact
Show Detailed Results
Exit Tool

Summary of predictions

Prediction of Impact	Step1
	Step2
	Step3

Soluble - Acute Impact

Copper	Zinc

Sediment - Chronic Impact

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

DETAILED RESULTS

In Runoff

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 1

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer
 Annual average concentration (ug/l)

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 2

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

Step 2

Velocity **0.18** m/s

Tier 2 is used for the calculation

DI **-**

% settlement needed **-** %

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer
 Annual average concentration (ug/l)

Thresholds
 Thresholds
 Event Statistics Mean
 90%ile
 95%ile
 99%ile

Step 3

Copper	Zinc

Copper	Zinc

(ug/l)	(ug/l)

DI **-**

Annual Average Concentration			Soluble - Acute Impact	Zinc	Sediment - Chronic Impact		
	Copper	Zinc	Copper	Zinc	Sediment deposition for this site is judged as:		
Step 2	0.02	0.05	ug/l	Pass	Alert. Protected Area.	Accumulating?	No 0.40 Low flow Vel m/s
Step 3	0.01	0.02	ug/l	Pass		Extensive?	No - Deposition Index

Location Details

Road number	A737 and NAC local roads		HA Area / DBFO number	
Assessment type	Cumulative assessment including sediments (outfalls within 100m)			
OS grid reference of assessment point (m)	Easting	229671	Northing	648062
OS grid reference of outfall structure (m)	Easting	229671	Northing	648062
Outfall number	Downstream of PSD2	List of outfalls in cumulative assessment		PSD1 PSD2 PSD3
Receiving watercourse	River Garnock	PSD4		PSD5
EA receiving water Detailed River Network ID	Assessor and affiliation		MLJ	
Date of assessment	10/05/2013		Version of assessment	2.0
Notes				

Step 1 Runoff Quality

AADT	>10,000 and <50,000	Climatic region	Colder Wet	Rainfall site	Ardtnaig (SAAR 1343.9mm)
------	---------------------	-----------------	------------	---------------	--------------------------

Step 2 River Impacts

Annual 95%ile river flow (m ³ /s)	0.553	(Enter zero in Annual 95%ile river flow box to assess Step 1 runoff quality only)	
Impermeable road area drained (ha)	9.98	Permeable area draining to outfall (ha)	0
Base Flow Index (BFI)	0.371	Is the discharge in or within 1 km upstream of a protected site for conservation?	Yes

For dissolved zinc only

Water hardness	Medium = 50-200 CaCO ₃ /l
----------------	--------------------------------------

For sediment impact only

Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge?	No	D
Tier 1 Estimated river width (m)	5	
Tier 2 Bed width (m)	16	
Manning's n	0.035	
Side slope (m/m)	0.666	
Long slope (m/m)	0.0031	

Step 3 Mitigation

	Brief description	Estimated effectiveness		
		Treatment for solubles (%)	Attenuation for solubles - restricted discharge rate (l/s)	Settlement of sediments (%)
Existing measures		0 D	Unlimited D	0 D
Proposed measures	Filter trenches/swale and detention basins along the route of the proposed road	60	107	70

Predict Impact
Show Detailed Results
Exit Tool

Summary of predictions

Prediction of impact	Step1
	Step2
	Step3

Soluble - Acute Impact

Copper	Zinc

Sediment - Chronic Impact

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

DETAILED RESULTS

In Runoff

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 1

Copper	Zinc
1	1
63.00	56.70
81	64

Copper	Zinc
1	1
18.00	20.60
24	27

(ug/l)	(ug/l)
21	92
42	184
23.36	67.70
45.65	147.58
54.99	194.62
96.36	372.28

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
1	1	1	1	1	1	1	1
83.80	112.10	2.20	48.30	111.00	48.30	23.00	91.00
97	128	7	59	127	59	32	101

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
197	315	3.5	16770	875	2355	245	515
331	1165	1	16068	2780	2667	170	752
733	2672	2	35481	6138	5890	376	1661
962	3572	3	70795	12247	11752	750	3313
1383	5637	4	89125	15419	14795	945	4171

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 2

Copper	Zinc
1	1
0	0
0	0
0	0
0	0

Copper	Zinc
0.5	0.5
0	0
0	0
0	0
0	0
0.02	0.05

(ug/l)	(ug/l)
21	92
42	184
0.06	0.20
0.13	0.33
0.29	0.75
0.97	4.13

Step 2

Velocity 0.40 m/s

DI -

% settlement needed - %

Tier 2 is used for the calculation

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 3

Copper	Zinc
1	1
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
0.5	0.5
0.00	0.00
0	0
0	0
0	0
0.01	0.02

(ug/l)	(ug/l)
21	92
42	184
0.02	0.08
0.05	0.13
0.12	0.30
0.39	1.64

DI -

Appendix 16.7

Method A Results

Additional columns for use if other roads drain to the same outfall					

System	Optimum Risk Reduction Factor
Filter Drain	0.6
Grassed Ditch / Swale	0.6
Pond	0.5
Wetland	0.4
Soakaway / Infiltration basin	0.6
Sediment Trap	0.6
Unlined Ditch	0.7
Penstock / valve	0.4
Notched Weir	0.6
Oil Separator	0.5

HAWRAT_Version 1_0.xlsSpillage Risk

Assessment of Priority Outfalls
Method D - assessment of risk from accidental spillage

Additional columns for use if other roads drain to the same outfall

	A (main road)	B	C	D	E	F		
D1	Water body type	Surface watercourse						
D2	Length of road draining to outfall (m)	1,316						
D3	Road Type (A-road or Motorway)	A						
D4	If A road, is site urban or rural?	Rural						
D5	Junction type	No junction						
D6	Location	< 1 hour						
D7	Traffic flow (AADT two way)	6,852						
D8	% HGV	11.7						
D8	Spillage factor (no/10 ⁹ HGVkm/year)	0.29						
D9	Risk of accidental spillage	0.00011	0.00000	0.00000	0.00000	0.00000	0.00000	
D10	Probability factor	0.60						
D11	Risk of pollution incident	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000	
D12	Is risk greater than 0.01?	No						
D13	Return period without pollution reduction measures	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000	0.0001 14924
D14	Existing measures factor	1						
D15	Return period with existing pollution reduction measures	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000	0.0001 14924
D16	Proposed measures factor	0.4						
D17	Residual with proposed Pollution reduction measures	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000 37311

Justification for choice of existing measures factors:**Justification for choice of proposed measures factors:**

PSD 2 - filter trench, detention basin and penstock for spillage containment

Table D1

Serious Accidental Spillages (Billion HGV km/ year)		Motorways	Rural Trunk	Urban Trunk
Location	No junction	0.36	0.29	0.31
	Slip road	0.43	0.83	0.36
	Roundabout	3.09	3.09	5.35
	Cross road	-	0.88	1.46
	Side road	-	0.93	1.81
	Total	0.37	0.45	0.85

Table 7.1

System	Optimum Risk Reduction Factor
Filter Drain	0.6
Grassed Ditch / Swale	0.6
Pond	0.5
Wetland	0.4
Soakaway / Infiltration basin	0.6
Sediment Trap	0.6
Unlined Ditch	0.7
Penstock / valve	0.4
Notched Weir	0.6
Oil Separator	0.5

The worksheet should be read in conjunction with DMRB 11.3.10.

Assessment of Priority Outfalls
Method D - assessment of risk from accidental spillage

Additional columns for use if other roads drain to the same outfall

	A (main road)	B	C	D	E	F		
D1	Water body type	Surface watercourse	Surface watercourse	Surface watercourse				
D2	Length of road draining to outfall (m)	200	345	760				
D3	Road Type (A-road or Motorway)	A	A	A				
D4	If A road, is site urban or rural?	Rural	Rural	Rural				
D5	Junction type	Roundabout	No junction	No junction				
D6	Location	< 1 hour	< 1 hour	< 1 hour				
D7	Traffic flow (AADT two way)	11,986	10,558	6,852				
D8	% HGV	11.2	7.3	11.7				
D8	Spillage factor (no/10 ⁹ HGVkm/year)	3.09	0.29	0.29				
D9	Risk of accidental spillage	0.00030	0.00003	0.00006	0.00000	0.00000	0.00000	
D10	Probability factor	0.60	0.60	0.60				
D11	Risk of pollution incident	0.00018	0.00002	0.00004	0.00000	0.00000	0.00000	
D12	Is risk greater than 0.01?	No	No	No				
D13	Return period without pollution reduction measures	0.00018	0.00002	0.00004	0.00000	0.00000	0.00000	0.0002 4215
D14	Existing measures factor	1	1	1				
D15	Return period with existing pollution reduction measures	0.00018	0.00002	0.00004	0.00000	0.00000	0.00000	0.0002 4215
D16	Proposed measures factor	0.4	0.4	0.4				
D17	Residual with proposed Pollution reduction measures	0.00007	0.00001	0.00002	0.00000	0.00000	0.00000	0.0001 10537

Justification for choice of existing measures factors:**Justification for choice of proposed measures factors:**

PSD 3 - filter trench, detention basin and penstock for spillage containment

Table D1

Serious Accidental Spillages (Billion HGV km/ year)		Motorways	Rural Trunk	Urban Trunk
Location	No junction	0.36	0.29	0.31
	Slip road	0.43	0.83	0.36
	Roundabout	3.09	3.09	5.35
	Cross road	-	0.88	1.46
	Side road	-	0.93	1.81
	Total	0.37	0.45	0.85

Table 7.1

System	Optimum Risk Reduction Factor
Filter Drain	0.6
Grassed Ditch / Swale	0.6
Pond	0.5
Wetland	0.4
Soakaway / Infiltration basin	0.6
Sediment Trap	0.6
Unlined Ditch	0.7
Penstock / valve	0.4
Notched Weir	0.6
Oil Separator	0.5

The worksheet should be read in conjunction with DMRB 11.3.10.

Assessment of Priority Outfalls
Method D - assessment of risk from accidental spillage

Additional columns for use if other roads drain to the same outfall

	A (main road)	B	C	D	E	F		
D1	Water body type	Surface watercourse	Surface watercourse					
D2	Length of road draining to outfall (m)	200	1,590					
D3	Road Type (A-road or Motorway)	A	A					
D4	If A road, is site urban or rural?	Rural	Rural					
D5	Junction type	Cross road	No junction					
D6	Location	< 1 hour	< 1 hour					
D7	Traffic flow (AADT two way)	3,233	5,554					
D8	% HGV	4.1	4.4					
D8	Spillage factor (no/10 ⁹ HGVkm/year)	0.88	0.29					
D9	Risk of accidental spillage	0.00001	0.00004	0.00000	0.00000	0.00000	0.00000	
D10	Probability factor	0.60	0.60					
D11	Risk of pollution incident	0.00001	0.00002	0.00000	0.00000	0.00000	0.00000	
D12	Is risk greater than 0.01?	No	No					
D13	Return period without pollution reduction measures	0.00001	0.00002	0.00000	0.00000	0.00000	0.00000	0.0000
D14	Existing measures factor	1	1					
D15	Return period with existing pollution reduction measures	0.00001	0.00002	0.00000	0.00000	0.00000	0.00000	0.0000
D16	Proposed measures factor	0.4	0.4					
D17	Residual with proposed Pollution reduction measures	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.0000
							Totals	Return Period (years)
							0.0000	33572
							0.0000	33572
							0.0000	83931

Justification for choice of existing measures factors:**Justification for choice of proposed measures factors:**

PSD 4 - filter trench, detention basin and penstock for spillage containment

Table D1

		Table 5.1		
		Serious Accidental Spillages (Billion HGV km/ year)		
		Motorways	Rural Trunk	Urban Trunk
Location	No junction	0.36	0.29	0.31
	Slip road	0.43	0.83	0.36
	Roundabout	3.09	3.09	5.35
	Cross road	-	0.88	1.46
	Side road	-	0.93	1.81
	Total	0.37	0.45	0.85

Table 7.1

System	Optimum Risk Reduction Factor
Filter Drain	0.6
Grassed Ditch / Swale	0.6
Pond	0.5
Wetland	0.4
Soakaway / Infiltration basin	0.6
Sediment Trap	0.6
Unlined Ditch	0.7
Penstock / valve	0.4
Notched Weir	0.6
Oil Separator	0.5

The worksheet should be read in conjunction with DMRB 11.3.10.

Assessment of Priority Outfalls
Method D - assessment of risk from accidental spillage

Additional columns for use if other roads drain to the same outfall

	A (main road)	B	C	D	E	F		
D1	Water body type	Surface watercourse						
D2	Length of road draining to outfall (m)	1,328						
D3	Road Type (A-road or Motorway)	A						
D4	If A road, is site urban or rural?	Rural						
D5	Junction type	No junction						
D6	Location	< 1 hour						
D7	Traffic flow (AADT two way)	10,558						
D8	% HGV	7.3						
D8	Spillage factor (no/10 ⁹ HGVkm/year)	0.29						
D9	Risk of accidental spillage	0.00011	0.00000	0.00000	0.00000	0.00000	0.00000	
D10	Probability factor	0.60						
D11	Risk of pollution incident	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000	
D12	Is risk greater than 0.01?	No						
D13	Return period without pollution reduction measures	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000	0.0001 15384
D14	Existing measures factor	1						
D15	Return period with existing pollution reduction measures	0.00007	0.00000	0.00000	0.00000	0.00000	0.00000	0.0001 15384
D16	Proposed measures factor	0.4						
D17	Residual with proposed Pollution reduction measures	0.00003	0.00000	0.00000	0.00000	0.00000	0.00000	0.0000 38459

Justification for choice of existing measures factors:**Justification for choice of proposed measures factors:**

PSD 5 - filter trench, detention basin and penstock for spillage containment

Table D1

Serious Accidental Spillages (Billion HGV km/ year)		Motorways	Rural Trunk	Urban Trunk
Location	No junction	0.36	0.29	0.31
	Slip road	0.43	0.83	0.36
	Roundabout	3.09	3.09	5.35
	Cross road	-	0.88	1.46
	Side road	-	0.93	1.81
	Total	0.37	0.45	0.85

Table 7.1

System	Optimum Risk Reduction Factor
Filter Drain	0.6
Grassed Ditch / Swale	0.6
Pond	0.5
Wetland	0.4
Soakaway / Infiltration basin	0.6
Sediment Trap	0.6
Unlined Ditch	0.7
Penstock / valve	0.4
Notched Weir	0.6
Oil Separator	0.5

The worksheet should be read in conjunction with DMRB 11.3.10.

Appendix 16.8

Method D Results