

Appendix G
Compiled Analytical Data

			Lab No.	581151	581493	586222	586403	586405	586404	583606	583607	591851	583604	583605	583602	583603	583110	583107	583108	583103	583104
			Sample ID	BH1	BH2	BH22	BH23	BH23	BH24	TP1	TP1	TP1	TP2	TP2	TP3	TP3	TP3	TP4	TP4	TP5	TP5
			Depth	2	3.8	0.7	2	2.6	3	0.4	1.5	1.7	0.5	1	0.5	2	5	0.4	1	0.3	1.7
			Area AC	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	/ /	26/11/2013	04/12/2013	09/12/2013	09/12/2013	09/12/2013	29/11/2013	29/11/2013	05/12/2013	29/11/2013	29/11/2013	29/11/2013	29/11/2013	28/11/2013	28/11/2013	28/11/2013	28/11/2013	28/11/2013
			Sample horizon	Sand	Gravel	MG	Gravel	Sand	Sand	MG	Gravel	Gravel	MG	Gravel	MG	Clay	Clay	Clay	Gravel	MG	Sand
Test	Units	DETSxx	LOD																		
Stones >2mm	% m/m	DETSC 1003*	1	6	3.2	3.9	4.7	9.1	3.8	4.9	4.2	-	4	8.3	2.3	6.3	3	6.4	5.1	3.5	6
Moisture Content	%	DETS 046*	0.1	13	10	8.4	17	9.7	17	18	9.6	-	11	12	15	24	22	24	14	7	20
Arsenic	mg/kg	DETSC2301#	0.2	5.6	8.3	8.7	7.7	9.6	6	54	12	-	20	13	13	8.7	8.7	8.9	17	5.6	3.7
Boron (water soluble)	mg/kg	DETSC2123#	0.2	0.4	0.3	< 0.2	< 0.2	< 0.2	< 0.2	1.6	< 0.2	-	0.4	0.3	1.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium	mg/kg	DETSC2301#	0.1	0.8	0.5	0.6	0.5	0.7	0.6	0.8	0.7	-	1.3	0.8	0.7	0.7	0.8	0.7	0.6	0.9	0.3
Chromium	mg/kg	DETSC2301#	0.15	18	22	18	20	22	20	28	23	-	30	22	17	32	42	43	20	10	13
Copper	mg/kg	DETSC2301#	0.2	14	17	14	24	17	15	81	22	-	45	23	18	22	23	21	16	20	12
Lead	mg/kg	DETSC2301#	0.3	16	44	20	14	15	20	48	20	-	100	43	77	23	27	21	30	52	9.5
Mercury	mg/kg	DETSC 2325#	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.07	< 0.05	-	0.26	0.09	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.11	< 0.05
Nickel	mg/kg	DETSC2301#	1	22	18	22	18	22	20	67	28	-	56	49	69	37	37	36	22	15	16
Selenium	mg/kg	DETSC2301#	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	0.7	< 0.5	< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	mg/kg	DETSC2301#	1	49	58	63	43	51	41	72	61	-	140	72	59	65	70	67	51	64	34
Loss on ignition	%	DETSC 2003#	0.01	0.89	0.68	1	0.49	0.7	0.6	7.4	1.5	-	4.9	1.9	2.4	2	2.7	1.9	1.9	1.4	0.91
pH		DETSC 2008#		10.1	8	9	8.7	8.3	8.1	8.6	8.1	-	8.3	8.4	9.2	8.5	8.7	8.8	8.3	9.6	8.6
Cyanide total	mg/kg	DETSC 2130#	0.1	2.7	0.2	< 0.1	0.1	< 0.1	< 0.1	0.5	1.3	-	29	16	3.8	0.1	< 0.1	0.2	0.8	1	< 0.1
Cyanide free	mg/kg	DETSC 2130#	0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.3	-	2.2	0.5	1.2	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Cyanide complex	mg/kg	DETSC 2130	0.2	2.5	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.3	1	-	26	15	2.6	< 0.2	< 0.2	0.2	0.8	1	< 0.2
Thiocyanate	mg/kg	DETSC 2130#	0.6	0.9	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	-	5.1	1.5	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Ammoniacal Nitrogen as N	mg/kg	DETSC 2119#	0.5	2.1	4.9	4.7	18	22	5.5	7.4	13	-	19	20	55	71	3.9	550	15	< 0.50	< 0.50
Chloride Aqueous Extract	mg/l	DETSC 2055	1	15	8.4	7.8	15	8.8	16	15	16	-	13	11	12	10	7.8	12	10	9.8	8.7
Sulphate Aqueous Extract as SO4	mg/l	DETSC 2076#	10	240	71	16	65	63	27	150	64	-	200	74	190	22	38	53	46	140	12
Sulphur (free)	mg/kg	DETSC 3049#	0.75	77	51	< 0.75	32	87	0.94	4.2	100	-	750	160	110	< 0.75	1.1	2.5	160	1.2	< 0.75
EPH (C10-C40)	mg/kg	DETSC 3311#	10	62	< 10	< 10	< 10	940	< 10	< 10	8400	-	18000	7400	8600	< 10	< 10	< 10	10000	400	< 10
Benzene	mg/kg	DETS 062#	0.01	0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	0.28	-	0.02	0.13	0.16	< 0.01	< 0.01	0.32	0.67	0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01	0.01	0.01	< 0.01	< 0.01	0.04	< 0.01	0.02	7.6	-	0.95	2.7	4.9	0.12	< 0.01	0.21	6	< 0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01	0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01	0.71	-	0.08	0.03	0.46	< 0.01	< 0.01	0.87	6	< 0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01	0.03	< 0.01	< 0.01	< 0.01	0.34	< 0.01	0.04	26	-	2.2	4.3	8.3	< 0.01	< 0.01	2.8	29	0.01	< 0.01
Acenaphthene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	16	< 0.1	< 0.1	50	-	17	20	53	< 0.1	< 0.1	< 0.1	130	0.3	< 0.1
Acenaphthylene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.6	< 0.1	0.1	120	-	150	73	71	< 0.1	< 0.1	< 0.1	93	0.8	< 0.1
Anthracene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	12	< 0.1	< 0.1	7.7	-	21	11	43	< 0.1	< 0.1	< 0.1	87	0.4	< 0.1
Benzo(a)anthracene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	5.7	< 0.1	< 0.1	1.4	-	11	8.7	29	< 0.1	< 0.1	< 0.1	64	1.4	< 0.1
Benzo(a)pyrene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	5.2	< 0.1	< 0.1	1	-	16	8.7	25	< 0.1	< 0.1	< 0.1	47	2	< 0.1
Benzo(b)fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.9	< 0.1	< 0.1	0.5	-	8.5	4.7	17	< 0.1	< 0.1	< 0.1	31	1.1	< 0.1
Benzo(k)fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.1	< 0.1	< 0.1	0.3	-	4.6	2.4	9.8	< 0.1	< 0.1	< 0.1	19	0.6	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.5	< 0.1	< 0.1	0.7	-	11	5.9	11	< 0.1	< 0.1	< 0.1	17	1	< 0.1
Chrysene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	5.9	< 0.1	< 0.1	1.6	-	13	9.3	28	< 0.1	< 0.1	< 0.1	55	1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5	< 0.1	< 0.1	0.3	-	1.1	1	1.9	< 0.1	< 0.1	< 0.1	6.5	0.2	< 0.1
Fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	16	< 0.1	< 0.1	11	-	45	40	68	< 0.1	< 0.1	< 0.1	120	1.3	< 0.1
Fluorene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	14	< 0.1	< 0.1	130	-	21	18	58	< 0.1	< 0.1	< 0.1	120	0.3	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.2	< 0.1	< 0.1	1.1	-	11	6.5	12	< 0.1	< 0.1	< 0.1	24	1.7	0.1
Naphthalene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.5	< 0.1	0.1	280	-	99	40	160	< 0.1	< 0.1	< 0.1	460	0.2	< 0.1
Phenanthrene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	28	< 0.1	< 0.1	21	-	45	29	100	< 0.1	< 0.1	< 0.1	230	0.3	< 0.1
Pyrene	mg/kg	DETSC 3301	0.1	< 0.1	< 0.1	< 0.1	< 0.1	12	< 0.1	< 0.1	6.9	-	51	42	62	< 0.1	< 0.1	< 0.1	96	1.1	< 0.1
PAH	mg/kg	DETSC 3301	1.6	< 1.6	< 1.6	< 1.6	< 1.6	130	< 1.6	< 1.6	640	-	530	320	750	< 1.6	< 1.6	< 1.6	1600	14	< 1.6
Catechol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	38	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cresols	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	5	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.53	< 0.50	< 0.50
Naphthols	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	3.1	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	4.1	< 0.50	< 0.50
Phenol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	8	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Resorcinol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	19	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trimethylphenol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	210	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	8.7	< 0.50	< 0.50
Xylenols & Ethylphenols	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	32	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	6.3	< 0.50	< 0.50
Total Phenols	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	< 0.50	< 0.50	310	< 0.50	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	20	< 0.50	< 0.50
Aliphatic C5-C6	mg/kg	DETSC 3321*	0.01	-	-	-	-	-	-	-	< 0.01	-	-	-	0.05	-	-	-	-	-	-
Aliphatic C6-C8	mg/kg	DETSC 3321*	0.01	-	-	-	-	-	-	-	< 0.01	-									

			Lab No.	583105	583106	581819	588612	588613	588614	588615	581820	581821	583101	583102	593358	593359	593360	593984	593986	588506	
			Sample ID	TP6	TP6	TP7	TP8	TP8	TP9	TP9	TP10	TP10	TP8A	TP8A	SD 1	SD 4	SD 2	SD3	SD CULV-UP	UPCUVSD	
			Depth	0.4	0.9	0.8	0.8	2.4	1	2.7	1.8	2	1.7	2.4							
			Area AC	2	2	2	2	2	2	2	2	2			4	4	4	4	4	4	
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
			Sampling Date	28/11/2013	28/11/2013	27/11/2013	27/11/2013	27/11/2013	27/11/2013	27/11/2013	27/11/2013	27/11/2013	28/11/2013	28/11/2013	09/01/14	09/01/14	09/01/14	09/01/14	09/01/14	13/12/2013	
			Sample horizon	MG	Sand	MG	Clay	Clay	Clay	Clay	Gravel	Clay	Gravel	Sand	Gravel	n/s	n/s	n/s	n/s		
Test	Units	DETSxx	LOD																		
Stones >2mm	% m/m	DETSC 1003*	1	7	6.9	3	4.9	6.1	4.5	7.1	8.1	6.4	2.4	5	4.7	5.1	4.4	2.9	5	7.2	
Moisture Content	%	DETS 046*	0.1	13	22	31	17	32	21	15	23	13	16	15	56	47	140	81	79	110	
Arsenic	mg/kg	DETSC2301#	0.2	14	10	3.4	4.6	5.8	10	6.1	10	6.7	2.8	5	6.9	9.1	11	21	9.5	8.1	
Boron (water soluble)	mg/kg	DETSC2123#	0.2	<0.2	<0.2	2.3	0.2	<0.2	<0.2	<0.2	1	1	<0.2	<0.2	2.5	1.9	4	0.8	2.4	2.4	
Cadmium	mg/kg	DETSC2301#	0.1	1.3	0.8	0.6	0.3	0.3	0.4	0.3	0.6	0.5	1.4	0.4	0.8	0.9	1.2	2.3	1.1	1.1	
Chromium	mg/kg	DETSC2301#	0.15	31	19	42	18	12	26	19	18	17	22	14	18	19	22	26	23	24	
Copper	mg/kg	DETSC2301#	0.2	55	42	38	14	7.3	21	18	15	15	11	14	20	23	26	48	24	25	
Lead	mg/kg	DETSC2301#	0.3	170	60	67	18	14	26	17	15	15	14	16	400	980	630	84	740	440	
Mercury	mg/kg	DETSC 2325#	0.05	0.52	0.21	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24	0.11	0.18	0.06	0.05	0.07	
Nickel	mg/kg	DETSC2301#	1	61	32	150	20	13	32	23	22	21	29	20	25	20	27	31	23	23	
Selenium	mg/kg	DETSC2301#	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	5.3	<0.5	0.8	
Zinc	mg/kg	DETSC2301#	1	200	170	140	150	49	67	53	51	45	56	46	170	270	280	1400	260	240	
Loss on ignition	%	DETSC 2003#	0.01	4.5	2.3	72	1.2	0.95	2.3	0.87	0.84	0.75	1.3	1.4	7.3	6.9	12	5.9	8	9	
pH		DETSC 2008#		8.5	8.3	10.1	7.8	7.6	7.9	8.2	7.8	8.1	8.2	8	7.7	7.6	7.4	8.1	7.5	7.3	
Cyanide total	mg/kg	DETSC 2130#	0.1	18	6	2.8	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.2	<0.1	1.5	0.6	0.9	1.3	0.2	0.2	
Cyanide free	mg/kg	DETSC 2130#	0.1	0.9	0.3	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.1	0.1	<0.1	<0.1	
Cyanide complex	mg/kg	DETSC 2130	0.2	17	5.7	2.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	1.4	0.6	0.7	1.2	<0.2	<0.2	
Thiocyanate	mg/kg	DETSC 2130#	0.6	1.4	1.1	1.1	<0.6	<0.6	<0.6	<0.6	<0.6	1	<0.6	<0.6	0.7	1.3	2	<0.6	1.4	1.2	
Ammoniacal Nitrogen as N	mg/kg	DETSC 2119#	0.5	9.6	6.5	3.1	16	9.3	13	6.2	29	64	8.2	5.1	31	21	48	6.1	13	52	
Chloride Aqueous Extract	mg/l	DETSC 2055	1	9	11	15	7.7	11	3.6	8.9	13	11	4.8	9.5	22	18	35	15	19	25	
Sulphate Aqueous Extract as SO4	mg/l	DETSC 2076#	10	140	<10	150	20	22	15	<10	17	16	20	32	63	280	230	86	120	86	
Sulphur (free)	mg/kg	DETSC 3049#	0.75	110	140	130	12	<0.75	<0.75	<0.75	1.6	8.4	11	<0.75	<0.75	5.8	25	13	3.6	<0.75	
EPH (C10-C40)	mg/kg	DETSC 3311#	10	6100	9500	12000	240	61	<10	<10	28	900	<10	<10	290	190	1000	2200	65	<10	
Benzene	mg/kg	DETS 062#	0.01	0.03	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.23	0.02	0.39	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Ethylbenzene	mg/kg	DETS 062#	0.01	0.02	0.05	0.01	0.02	<0.01	<0.01	<0.01	0.1	0.06	1.6	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Toluene	mg/kg	DETS 062#	0.01	0.09	0.02	0.04	<0.01	<0.01	<0.01	<0.01	0.27	0.07	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Xylene	mg/kg	DETS 062#	0.01	0.96	0.15	0.09	0.27	<0.01	<0.01	<0.01	0.15	0.3	3.6	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Acenaphthene	mg/kg	DETSC 3301	0.1	5.5	6.7	100	1	<0.1	<0.1	<0.1	0.4	12	<0.1	<0.1	<0.1	0.4	3.2	1.5	<0.1	<0.1	
Acenaphthylene	mg/kg	DETSC 3301	0.1	1.6	3.4	99	0.5	<0.1	<0.1	<0.1	0.3	7.5	0.2	<0.1	1	0.8	4.3	4.9	0.1	<0.1	
Anthracene	mg/kg	DETSC 3301	0.1	2	4.3	18	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.9	4.1	3.3	0.1	<0.1	
Benzo(a)anthracene	mg/kg	DETSC 3301	0.1	3.3	6	6.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.4	0.8	5.8	14	0.4	<0.1
Benzo(a)pyrene	mg/kg	DETSC 3301	0.1	3.6	5.8	9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.4	0.9	6	14	0.3	<0.1
Benzo(b)fluoranthene	mg/kg	DETSC 3301	0.1	2.2	4.3	5.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	1	3.8	9.1	0.2	<0.1
Benzo(k)fluoranthene	mg/kg	DETSC 3301	0.1	1.3	2.3	5.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.7	0.4	2.9	6.7	0.3	<0.1
Benzo(g,h,i)perylene	mg/kg	DETSC 3301	0.1	1.7	2.8	3.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	<0.1	2	9	1.3	<0.1	
Chrysene	mg/kg	DETSC 3301	0.1	3.7	6.3	6.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	0.8	4	14	0.4	<0.1
Dibenzo(a,h)anthracene	mg/kg	DETSC 3301	0.1	0.3	0.6	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	<0.1	1.2	1.7	0.8	<0.1
Fluoranthene	mg/kg	DETSC 3301	0.1	9.1	17	44	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.5	2.4	9.7	19	0.9	<0.1
Fluorene	mg/kg	DETSC 3301	0.1	5	18	20	<0.1	<0.1	<0.1	<0.1	<0.1	1.1	<0.1	<0.1	<0.1	<0.1	0.6	3.5	3.8	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETSC 3301	0.1	2.4	3.5	8.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.3	0.6	4.4	8.1	0.6	<0.1
Naphthalene	mg/kg	DETSC 3301	0.1	12	20	40	64	<0.1	<0.1	<0.1	2	23	<0.1	<0.1	<0.1	<0.1	0.4	0.4	1.9	<0.1	<0.1
Phenanthrene	mg/kg	DETSC 3301	0.1	5.4	13	37	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	2.4	7.8	3.4	0.1	<0.1
Pyrene	mg/kg	DETSC 3301	0.1	5	11	32	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2	1.8	7.8	18	0.6	<0.1
PAH	mg/kg	DETSC 3301	1.6	64	120	440	65	<1.6	<1.6	<1.6	2.7	44	<1.6	<1.6	14	14</					

			Lab No.	587085	583616	583615	587078	593358	593358	587079	593360	587745	593984	587080	593359	593986	588505	588506	584219	620863	620864	620865	620866
			Sample ID	RB1	TP32	TP32	SD1	SD 1	SD 1	SD2	SD 2	SD3	SD3	SD4	SD 4	SD CULV-UP	SED3(A)	UPCUVSD	TP35	SS 11-02-1	SED 4	SS 11-02-3	RB1
			Depth		2	2.00-2.50													0.40				
			Area AC	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		SOIL	SOIL	SOIL	SOIL
			Sampling Date	10/12/2013	02/12/2013	02/12/2013	10/12/2013	09/01/14	09/01/14	10/12/2013	09/01/14	11/12/2013	09/01/14	10/12/2013	09/01/14	09/01/14	13/12/2013	13/12/2013	03/12/2013	12/03/14	12/03/14	12/03/14	12/03/14
			Sample horizon	Brook bank	MG	MG	Downstream		n/s	Upstream	n/s	Pond outfall	n/s	Midstream	n/s	n/s							
Test	Units	DETSxx	LOD																				
Stones >2mm	% m/m	DETSC 1003*	1	3.5	5.2	7.3	4.7	4.7	4.7	6.2	4.4	5.3	2.9	5.3	5.1	5	2.4	7.2	4.4	2.3	5	6.2	5.4
Moisture Content	%	DETS 046*	0.1	65	23	-	26	56	56	39	140	140	81	68	47	79	36	110	16	90	180	68	420
Arsenic	mg/kg	DETSC2301#	0.2	32	37	-	13	6.9	6.9	8.7	11	8.6	21	8.4	9.1	9.5	25	8.1	10	10	8	19	45
Boron (water soluble)	mg/kg	DETSC2123#	0.2	0.8	0.7	-	0.7	2.5	2.5	1.3	4	2.2	0.8	2.2	1.9	2.4	0.3	2.4	0.6	4.3	5.5	3.2	5.6
Cadmium	mg/kg	DETSC2301#	0.1	2.3	1.1	-	1.2	0.8	0.8	0.9	1.2	0.8	2.3	1.1	0.9	1.1	2.1	1.1	0.3	1.5	1	0.7	4.1
Chromium	mg/kg	DETSC2301#	0.15	20	35	-	19	18	18	16	22	31	26	24	19	23	20	24	9.7	29	28	23	11
Copper	mg/kg	DETSC2301#	0.2	14	64	-	20	20	20	18	26	19	48	23	23	24	44	25	73	30	28	21	13
Lead	mg/kg	DETSC2301#	0.3	220	300	-	1800	400	400	690	630	32	84	660	980	740	93	440	49	680	380	40	41
Mercury	mg/kg	DETSC 2325#	0.05	< 0.05	< 0.05	-	< 0.05	0.24	0.24	0.09	0.18	< 0.05	0.06	0.15	0.11	0.05	0.05	0.07	< 0.05	0.08	0.13	< 0.05	< 0.05
Nickel	mg/kg	DETSC2301#	1	19	35	-	110	25	25	19	27	28	31	22	20	23	20	23	31	28	22	15	7.6
Selenium	mg/kg	DETSC2301#	0.5	< 0.5	2.6	-	< 0.5	< 0.5	< 0.5	< 0.5	0.5	0.5	5.3	< 0.5	< 0.5	< 0.5	4.3	0.8	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	mg/kg	DETSC2301#	1	140	290	-	300	170	170	210	280	120	1400	260	270	260	1200	240	220	450	250	110	92
Loss on Ignition	%	DETSC 2003#	0.01	9.9	8.6	-	2.3	7.3	7.3	5.1	12	9.7	5.9	9.9	6.9	8	2.8	9	7.0	9.8	17	9.1	35
pH		DETSC 2008#		7.8	10.1	-	8.5	7.7	7.7	7.9	7.4	7.5	8.1	7.3	7.6	7.5	8.2	7.3	8.1	7.6	7.4	7.6	7.7
Cyanide total	mg/kg	DETSC 2130#	0.1	4.1	3.2	-	0.6	1.5	1.5	0.7	0.9	0.2	1.3	1.5	0.6	0.2	1.8	0.2	7.7	0.3	0.8	2.2	29
Cyanide free	mg/kg	DETSC 2130#	0.1	0.4	0.6	-	< 0.1	0.2	0.2	0.1	0.1	< 0.1	0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.4	< 0.1	0.2	0.2	0.5
Cyanide complex	mg/kg	DETSC 2130	0.2	3.7	2.7	-	0.6	1.4	1.4	0.6	0.7	< 0.2	1.2	1.3	0.6	< 0.2	1.8	< 0.2	7.4	0.3	0.6	2	28
Thiocyanate	mg/kg	DETSC 2130#	0.6	< 0.6	1.1	-	< 0.6	0.7	0.7	< 0.6	2	< 0.6	< 0.6	< 0.6	1.3	1.4	< 0.6	1.2	< 0.6	1.4	0.9	0.7	1.4
Ammoniacal Nitrogen as N	mg/kg	DETSC 2119#	0.5	8.1	15	-	6.2	31	31	6	48	51	6.1	18	21	13	16	52	6.6	3.9	7.4	3.2	4.6
Chloride Aqueous Extract	mg/l	DETSC 2055	1	6.6	15	-	19	22	22	18	35	20	15	19	18	19	9.6	25	54	20	19	30	560
Sulphate Aqueous Extract as SO4	mg/l	DETSC 2076#	10	170	300	-	51	63	63	42	230	51	86	190	280	120	53	86	40	220	100	190	68
Sulphur (free)	mg/kg	DETSC 3049#	0.75	< 0.75	360	-	< 0.75	< 0.75	< 0.75	2.5	25	< 0.75	13	13	5.8	3.6	< 0.75	< 0.75	9.8	7.6	5	< 0.75	< 0.75
EPH (C10-C40)	mg/kg	DETSC 3311#	10	< 10	2000	-	< 10	290	290	190	1000	< 10	2200	2900	190	65	68	< 10	1000	20	800	< 10	620
Benzene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01	< 0.01	6.1	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Toluene	mg/kg	DETS 062#	0.01	< 0.01	0.55	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Xylene	mg/kg	DETS 062#	0.01	< 0.01	14	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	mg/kg	DETSC 3301	0.1	< 0.1	83	-	< 0.1	< 0.1	< 0.1	< 0.1	3.2	< 0.1	1.5	6.8	0.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	6.2	< 0.1	1
Acenaphthylene	mg/kg	DETSC 3301	0.1	< 0.1	17	-	< 0.1	1	1	0.6	4.3	< 0.1	4.9	14	0.8	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETSC 3301	0.1	< 0.1	30	-	< 0.1	< 0.1	< 0.1	0.3	4.1	< 0.1	3.3	28	0.9	0.1	< 0.1	< 0.1	< 0.1	< 0.1	8.5	< 0.1	1
Benzo(a)anthracene	mg/kg	DETSC 3301	0.1	< 0.1	11	-	< 0.1	1.4	1.4	0.9	5.8	< 0.1	14	27	0.8	0.4	< 0.1	< 0.1	< 0.1	< 0.1	6.1	0.7	< 0.1
Benzo(a)pyrene	mg/kg	DETSC 3301	0.1	< 0.1	13	-	< 0.1	1.4	1.4	0.9	6	< 0.1	14	21	0.9	0.3	< 0.1	< 0.1	< 0.1	< 0.1	4.6	0.2	1.3
Benzo(b)fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1	6.9	-	< 0.1	1.1	1.1	0.8	3.8	< 0.1	9.1	14	1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	2.8	< 0.1	2.9
Benzo(k)fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1	3.9	-	< 0.1	0.7	0.7	0.5	2.9	< 0.1	6.7	9.3	0.4	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.4	0.2
Benzo(g,h,i)perylene	mg/kg	DETSC 3301	0.1	< 0.1	17	-	< 0.1	0.6	0.6	0.3	2	< 0.1	9	9.3	< 0.1	1.3	< 0.1	< 0.1	< 0.1	< 0.1	1.7	< 0.1	< 0.1
Chrysene	mg/kg	DETSC 3301	0.1	< 0.1	12	-	< 0.1	1.1	1.1	0.8	4	< 0.1	14	24	0.8	0.4	< 0.1	< 0.1	< 0.1	< 0.1	5.9	0.3	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETSC 3301	0.1	< 0.1	0.4	-	< 0.1	0.6	0.6	0.3	1.2	< 0.1	1.7	2.7	< 0.1	0.8	< 0.1	< 0.1	< 0.1	< 0.1	0.6	0.1	< 0.1
Fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1	70	-	< 0.1	2.5	2.5	1.6	9.7	< 0.1	19	55	2.4	0.9	< 0.1	< 0.1	< 0.1	< 0.1	16	0.2	2.2
Fluorene	mg/kg	DETSC 3301	0.1	< 0.1	34	-	< 0.1	< 0.1	< 0.1	< 0.1	3.5	< 0.1	3.8	13	0.6	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	6.5	< 0.1	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETSC 3301	0.1	< 0.1	9.5	-	< 0.1	1.3	1.3	1	4.4	< 0.1	8.1	11	0.6	0.6	< 0.1	< 0.1	< 0.1	< 0.1	2.5	< 0.1	0.7
Naphthalene	mg/kg	DETSC 3301	0.1	< 0.1	67	-	< 0.1	< 0.1	< 0.1	0.2	0.4	< 0.1	1.9	5.7	0.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	3.6	< 0.1	< 0.1
Phenanthrene	mg/kg	DETSC 3301	0.1	< 0.1	120	-	< 0.1	< 0.1	< 0.1	0.4	7.8	< 0.1	3.4	56	2.4	0.1	< 0.1	< 0.1	< 0.1	< 0.1	18	< 0.1	< 0.1
Pyrene	mg/kg	DETSC 3301	0.1	< 0.1	88	-	< 0.1	2	2	1.3	7.8	< 0.1	18	47	1.8	0.6	< 0.1	< 0.1	< 0.1	< 0.1	12	0.2	0.6
PAH	mg/kg	DETSC 3301	1.6	< 1.6	590	-	< 1.6	14	14	10	71	< 1.6	130	340	14	6.3	< 1.6	< 1.6	< 1.6	< 1.6	100	2	12
Catechol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cresols	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthols	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Resorcinol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	-	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trimethylphenol	mg/kg	DETSC 3421*	0.5	< 0.50	< 0.50	-																	

			Lab No.	587744
			Sample ID	OX-BSD
			Depth	
			Sample Ref	
			Sample Type	SOIL
			Sampling Date	11/12/2013
			Ocboc lake sediment	
Test	Units	DETSxx	LOD	
Stones >2mm	% m/m	DETSC 1003*	1	2.8
Moisture Content	%	DETS 046*	0.1	240
Arsenic	mg/kg	DETSC2301#	0.2	12
Boron (water soluble)	mg/kg	DETSC2123#	0.2	3.1
Cadmium	mg/kg	DETSC2301#	0.1	8.7
Chromium	mg/kg	DETSC2301#	0.15	37
Copper	mg/kg	DETSC2301#	0.2	43
Lead	mg/kg	DETSC2301#	0.3	690
Mercury	mg/kg	DETSC 2325#	0.05	0.2
Nickel	mg/kg	DETSC2301#	1	31
Selenium	mg/kg	DETSC2301#	0.5	0.6
Zinc	mg/kg	DETSC2301#	1	1300
Loss on ignition	%	DETSC 2003#	0.01	12
pH		DETSC 2008#		8
Cyanide total	mg/kg	DETSC 2130#	0.1	1.1
Cyanide free	mg/kg	DETSC 2130#	0.1	0.2
Cyanide complex	mg/kg	DETSC 2130	0.2	0.9
Thiocyanate	mg/kg	DETSC 2130#	0.6	6.5
Ammoniacal Nitrogen as N	mg/kg	DETSC 2119#	0.5	66
Chloride Aqueous Extract	mg/l	DETSC 2055	1	48
Sulphate Aqueous Extract as SO4	mg/l	DETSC 2076#	10	670
Sulphur (free)	mg/kg	DETSC 3049#	0.75	59
EPH (C10-C40)	mg/kg	DETSC 3311#	10	< 10
Benzene	mg/kg	DETS 062#	0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01	< 0.01
Acenaphthene	mg/kg	DETSC 3301	0.1	< 0.1
Acenaphthylene	mg/kg	DETSC 3301	0.1	< 0.1
Anthracene	mg/kg	DETSC 3301	0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETSC 3301	0.1	< 0.1
Benzo(a)pyrene	mg/kg	DETSC 3301	0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETSC 3301	0.1	< 0.1
Chrysene	mg/kg	DETSC 3301	0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETSC 3301	0.1	< 0.1
Fluoranthene	mg/kg	DETSC 3301	0.1	< 0.1
Fluorene	mg/kg	DETSC 3301	0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETSC 3301	0.1	< 0.1
Naphthalene	mg/kg	DETSC 3301	0.1	< 0.1
Phenanthrene	mg/kg	DETSC 3301	0.1	< 0.1
Pyrene	mg/kg	DETSC 3301	0.1	< 0.1
PAH	mg/kg	DETSC 3301	1.6	< 1.6
Catechol	mg/kg	DETSC 3421*	0.5	< 0.50
Cresols	mg/kg	DETSC 3421*	0.5	< 0.50
Naphthols	mg/kg	DETSC 3421*	0.5	< 0.50
Phenol	mg/kg	DETSC 3421*	0.5	< 0.50
Resorcinol	mg/kg	DETSC 3421*	0.5	< 0.50
Trimethylphenol	mg/kg	DETSC 3421*	0.5	< 0.50
Xylenols & Ethylphenols	mg/kg	DETSC 3421*	0.5	< 0.50
Total Phenols	mg/kg	DETSC 3421*	0.5	< 0.50
Total Mass% Asbestos (i+ii)	Mass %			
Quantification by Phase Contrast Optical	Mass %	DETSC 1102		
Gravimetric Quantification (ii)	Mass %	DETSC 1102		
Breakdown of Gravimetric Analysis				
Mass of Sample	g			
ACMs present*				
Mass of ACM in sample	g			
% ACM by mass	%			
% asbestos in ACM	%			
% asbestos in sample	%			
Potentially Respirable Fibres	Fibres/g	DETSC 1102		

	Lab No		587742	593938	587743	593939	593940	587746	593942	587747	593941	587341	593937
	Sample ID		BH3	BH3	BH5	BH5	MW11-02	MW11-16	MW11-16	MW99-104	MW99-104	MW99-106	MW99-106
	Area AC		1	1	1	1	1	1	1	1	1	1	1
	Other ID		Clay/gravel	Clay/gravel	silt, clay, gravel	silt,clay, gravel	MG/Clay/Sand	Clay/Sand		Clay/sand	clay/sand	Gravel	Gravel
	Sample Type		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Sampling Date		11/12/2013	10/01/14	11/12/2013	10/01/14	10/01/14	11/12/2013	10/01/14	11/12/2013	10/01/14	12/12/2013	10/01/14
Sampling Time	Screening Value			n/s		n/s	n/s		n/s		n/s		n/s
Test	Units	EQS											
Arsenic, Dissolved	ug/l	50	2.2	2.5	6.3	0.43	2.4	1.1	1.2	2.1	2.9	6.8	11
Cadmium, Dissolved	ug/l	0.08	0.17	0.073	0.7	0.07	0.14	0.23	0.074	0.069	< 0.030	0.041	< 0.030
Chromium, Dissolved	ug/l	4.7	< 0.25	0.3	1.4	< 0.25	7.4	4.6	6.5	< 0.25	0.43	0.81	1
Copper, Dissolved	ug/l	1	2.2	2.5	4.7	1.5	8.8	3.9	4.2	0.89	1.5	2.6	1.3
Iron, Dissolved	ug/l	1000	180	200	1900	200	2600	180	220	250	1100	710	580
Lead, Dissolved	ug/l	7.2	0.97	0.82	27	0.24	9.7	1.1	1.2	0.73	0.39	2.7	0.42
Mercury, Dissolved	ug/l	0.05	< 0.010	0.01	< 0.010	< 0.01	< 0.01	< 0.010	< 0.01	< 0.010	< 0.01	< 0.010	< 0.01
Nickel, Dissolved	ug/l	20	4.2	3	8.1	5.3	2.5	2.3	1.9	4.3	1.9	1.1	0.76
Selenium, Dissolved	ug/l		0.89	2	0.39	10	3.3	1.9	2.4	0.35	0.47	0.53	0.41
Zinc, Dissolved	ug/l	8	47.6	28.2	45.7	28.1	30.9	66.8	115	27.1	41.1	28.9	22.2
Calcium	ug/l		-	-	-	-	-	-	-	-	-	-	-
Magnesium	ug/l		-	-	-	-	-	-	-	-	-	-	-
Sodium	ug/l		-	-	-	-	-	-	-	-	-	-	-
Potassium	ug/l		-	-	-	-	-	-	-	-	-	-	-
Iron (Total)	ug/l		-	-	-	-	-	-	-	-	-	-	-
Manganese	ug/l		-	-	-	-	-	-	-	-	-	-	-
Conductivity	uS/cm		1670	1520	1350	992	1080	1490	1150	1550	1800	1600	1670
pH		ph6-ph9	7	7.2	6.2	7	7.3	6.9	7.3	6.9	7	7.9	7.7
Cyanide total	ug/l	1	260	200	230	180	1100	250	140	310	390	130	140
Cyanide free	ug/l	1	< 20	< 20	< 20	< 20	58	< 20	< 20	< 20	< 20	< 20	< 20
Cyanide complex	ug/l		260	200	230	180	1100	250	140	310	390	130	140
Thiocyanate	ug/l		250	32000	1200	210	95	< 40	270	4000	18000	64	< 40
Total Dissolved Solids	ug/l		-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	mg/l		12000	6300	8400	1200	2500	33000	6300	1600	400	140	76
Ammoniacal Nitrogen as N	mg/l	17	46	77	34	30	4.6	0.61	23	70	49	120	74
Total Nitrogen as N	ug/l		-	-	-	-	-	-	-	-	-	-	-
Nitrate	ug/l		-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/l	250	24	23	13	15	10	20	18	23	29	38	30
Sulphate as SO4	mg/l	400	420	370	450	220	290	380	210	330	520	87	140
Sulphide	ug/l		11	< 10.0	< 10	< 10.0	< 10.0	< 10	< 10.0	< 10	< 10.0	13	< 10.0
Sulphur (free)	ug/l		< 84	100	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84	120
Total Organic Carbon	mg/l		76	72	78	15	28	190	80	31	24	33	31
TPH	ug/l		-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C40)	ug/l		730	430	2100	280	490	720	490	600	370	2300	3700
Benzene	ug/l	10	< 1.0	< 1.0	1.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4
Toluene	ug/l	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2
Ethylbenzene	ug/l	20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p Xylenes	ug/l	30	-	-	-	-	-	-	-	-	-	-	-
o Xylene	ug/l	30	-	-	-	-	-	-	-	-	-	-	-
Xylene	ug/l	30	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	13
MTBE	ug/l	10	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	ug/l		< 0.01	0.03	0.01	< 0.01	0.05	< 0.01	0.07	< 0.01	0.04	0.13	9
Acenaphthylene	ug/l		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	ug/l	0.1	< 0.01	< 0.01	0.03	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.04	< 0.01	0.33
Benzo(a)anthracene	ug/l		< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04
Benzo(a)pyrene	ug/l	0.05	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Benzo(b)fluoranthene	ug/l	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	ug/l	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	ug/l	0.002	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	ug/l		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	ug/l		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	ug/l	0.1	< 0.01	0.01	0.02	< 0.01	0.03	< 0.01	< 0.01	< 0.01	0.04	0.02	0.32
Fluorene	ug/l		< 0.01	0.02	0.03	< 0.01	0.02	< 0.01	0.02	< 0.01	0.05	0.02	0.88
Indeno(1,2,3-c,d)pyrene	ug/l	0.002	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	ug/l	2.4	0.02	0.03	0.06	< 0.01	0.08	0.04	0.07	0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	ug/l		0.01	0.03	0.06	< 0.01	0.04	< 0.01	< 0.01	0.03	0.11	< 0.01	0.69
Pyrene	ug/l		< 0.01	< 0.01	0.03	< 0.01	0.04	< 0.01	< 0.01	0.02	0.05	0.04	0.27
PAH	ug/l		< 0.20	< 0.20	0.26	< 0.20	0.35	< 0.20	< 0.20	< 0.20	0.34	0.22	12
Catechol	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	33	3.6
Cresols	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	29	57
Naphthols	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	6.9	16
Phenol	ug/l	7.7	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	23	59
Resorcinol	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.75	< 0.10
Dimethylphenols	ug/l		-	-	-	-	-	-	-	-	-	-	-
Trimethylphenol	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	22	46
Xylenols & Ethylphenols	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	22	28
Total Phenols	ug/l		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	140	210

	Lab No	587336	593290	587337	592963	587332	593990	593991	593988	593989	587334	593987
	Sample ID	BH1	BH1	BH2	BH2	MW11-05	MW11-05	MW11-05D	MW11-07	MW11-07D	MW11-08B	MW11-08B
	Area AC	2	2	2	2	2	2	2	2	2	2	2
	Other ID	silt/sand	silt/sand	silt/gravel	sil/gravel	MG - Gravel	MG gravel		MG/clay		MG/Clay	MG/clay
	Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	Sampling Date	12/12/2013	08/01/14	12/12/2013	07/01/14	12/12/2013	09/01/14	09/01/14	09/01/14	09/01/14	12/12/2013	09/01/14
Sampling Time			n/s		n/s		n/s	n/s	n/s	n/s		n/s
Test	Units											
Arsenic, Dissolved	ug/l	4.2	1.6	4.6	3.9	1.2	0.77	0.63	2.9	2.3	15	7.9
Cadmium, Dissolved	ug/l	0.041	0.22	< 0.030	< 0.030	0.067	0.11	0.04	< 0.03	0.04	0.098	< 0.03
Chromium, Dissolved	ug/l	0.83	< 0.25	0.48	0.99	< 0.25	< 0.25	< 0.25	< 0.25	0.33	0.92	0.41
Copper, Dissolved	ug/l	3.8	2	1.8	1.5	0.59	0.9	0.4	1.6	1.8	3.6	1.4
Iron, Dissolved	ug/l	530	71	290	260	1400	70	120	67	81	7200	780
Lead, Dissolved	ug/l	4.8	0.24	2.7	0.91	0.75	0.35	0.15	0.37	0.64	0.48	0.95
Mercury, Dissolved	ug/l	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.010	0.01
Nickel, Dissolved	ug/l	3.5	4.1	3.8	4.3	3.7	5.4	3.9	6.4	6.6	9	7.6
Selenium, Dissolved	ug/l	0.35	0.81	< 0.25	4.5	< 0.25	0.31	0.86	1.1	1.1	< 0.25	0.63
Zinc, Dissolved	ug/l	45.5	161	35.7	48.5	28.8	20.4	35.7	19.1	30	50.6	44.5
Calcium	ug/l	-	-	-	-	-	-	-	-	-	-	-
Magnesium	ug/l	-	-	-	-	-	-	-	-	-	-	-
Sodium	ug/l	-	-	-	-	-	-	-	-	-	-	-
Potassium	ug/l	-	-	-	-	-	-	-	-	-	-	-
Iron (Total)	ug/l	-	-	-	-	-	-	-	-	-	-	-
Manganese	ug/l	-	-	-	-	-	-	-	-	-	-	-
Conductivity	uS/cm	646	455	623	495	2290	567	2070	268	268	998	833
pH		7.8	8.1	7.5	7.8	7.6	7.5	7.3	7.6	7.7	6.9	7.2
Cyanide total	ug/l	240	43	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Cyanide free	ug/l	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Cyanide complex	ug/l	240	43	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Thiocyanate	ug/l	58	< 40	40	< 40	240	91	90	< 40	< 40	< 40	< 40
Total Dissolved Solids	ug/l	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	mg/l	44000	8600	88000	9300	610	2100	1100	660	820	1400	3500
Ammoniacal Nitrogen as N	mg/l	2.1	0.3	1.4	2.7	6.4	3.5	5.8	0.46	0.39	13	1.5
Total Nitrogen as N	ug/l	-	-	-	-	-	-	-	-	-	-	-
Nitrate	ug/l	-	-	-	-	-	-	-	-	-	-	-
Chloride	mg/l	36	43	30	31	140	130	140	11	9.9	65	44
Sulphate as SO4	mg/l	110	100	60	98	930	890	970	9.8	9.7	9	63
Sulphide	ug/l	< 10	< 10.0	< 10	< 10.0	< 10	< 10.0	< 10.0	< 10.0	< 10.0	< 10	< 10.0
Sulphur (free)	ug/l	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84
Total Organic Carbon	mg/l	790	36	670	89	15	8.5	6.1	23	33	91	150
TPH	ug/l	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C40)	ug/l	19000	3300	2500	1200	220	250	250	1000	510	300000	380000000
Benzene	ug/l	< 1.0	< 1.0	2.5	1.6	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	14
Toluene	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7
Ethylbenzene	ug/l	6.7	< 1.0	4.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	47
m/p Xylenes	ug/l	-	-	-	-	-	-	-	-	-	-	-
o Xylene	ug/l	-	-	-	-	-	-	-	-	-	-	-
Xylene	ug/l	4.7	< 1.0	11	4.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	15	74
MTBE	ug/l	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	ug/l	0.04	< 0.01	0.15	1.6	< 0.01	0.04	< 0.01	0.87	0.89	24	980
Acenaphthylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	ug/l	0.08	0.01	0.03	0.02	0.03	0.23	0.28	1.3	0.64	5.1	660
Benzo(a)anthracene	ug/l	0.07	0.01	0.02	< 0.01	< 0.01	0.02	0.02	0.3	0.25	1.3	160
Benzo(a)pyrene	ug/l	0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.24	0.2	0.49	67
Benzo(b)fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.18	0.13	0.39	49
Benzo(k)fluoranthene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.08	0.09	0.3	28
Benzo(g,h,i)perylene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.15	0.12	0.17	32
Chrysene	ug/l	0.13	< 0.01	0.15	< 0.01	< 0.01	< 0.01	< 0.01	0.17	0.14	0.29	25
Dibenzo(a,h)anthracene	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04	0.17	< 0.01
Fluoranthene	ug/l	0.14	0.09	0.04	0.02	0.15	0.28	0.22	1.8	1.4	3	520
Fluorene	ug/l	0.14	0.02	0.07	0.19	0.02	0.21	0.14	0.94	0.6	110	640
Indeno(1,2,3-c,d)pyrene	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.19	0.2	0.41	68
Naphthalene	ug/l	< 0.01	< 0.01	0.38	0.04	0.38	0.32	0.21	0.31	0.05	45	4400
Phenanthrene	ug/l	0.04	< 0.01	0.09	< 0.01	0.02	0.23	0.28	0.13	0.05	13	1600
Pyrene	ug/l	0.09	0.05	0.03	< 0.01	0.2	0.33	0.23	1.7	1.6	3.6	470
PAH	ug/l	0.78	< 0.20	0.98	1.8	0.8	1.7	1.4	8.3	6.4	110	9700
Catechol	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthols	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	ug/l	1.6	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dimethylphenols	ug/l	-	-	-	-	-	-	-	-	-	-	-
Trimethylphenol	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Xylenols & Ethylphenols	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Phenols	ug/l	1.6	< 0.10	< 0.10	< 0.10	1.4	< 0.10	< 0.10	< 0.10	< 0.10	1.1	< 0.10

		Lab No	587335	592962
		Sample ID	MW99-202	MW99-202
		Area AC	4	4
		Other ID	MG/Clay	MG/clay
		Sample Type	WATER	WATER
		Sampling Date	12/12/2013	07/01/14
		Sampling Time		n/s
Test	LOD	Units		
Arsenic, Dissolved	0.16	ug/l	12	63
Cadmium, Dissolved	0.03	ug/l	4.3	3.3
Chromium, Dissolved	0.25	ug/l	190	310
Copper, Dissolved	0.4	ug/l	550	890
Iron, Dissolved	5.5	ug/l	120000	160000
Lead, Dissolved	0.09	ug/l	14	25
Mercury, Dissolved	0.01	ug/l	< 0.010	< 0.010
Nickel, Dissolved	0.5	ug/l	270	260
Selenium, Dissolved	0.25	ug/l	6	8.6
Zinc, Dissolved	1.25	ug/l	3090	3480
Calcium		ug/l	-	-
Magnesium		ug/l	-	-
Sodium		ug/l	-	-
Potassium		ug/l	-	-
Iron (Total)		ug/l	-	-
Manganese		ug/l	-	-
Conductivity	1	uS/cm	3760	6610
pH			2.7	2.3
Cyanide total	40	ug/l	< 40	93
Cyanide free	20	ug/l	< 20	< 20
Cyanide complex	40	ug/l	< 40	93
Thiocyanate	40	ug/l	91	210
Total Dissolved Solids		ug/l	-	-
Suspended Solids	5	mg/l	3500	1800
Ammoniacal Nitrogen as N	0.015	mg/l	7.7	5.1
Total Nitrogen as N		ug/l	-	-
Nitrate		ug/l	-	-
Chloride	0.1	mg/l	15	15
Sulphate as SO4	0.1	mg/l	2400	2500
Sulphide	10	ug/l	< 10	< 10.0
Sulphur (free)	84	ug/l	< 84	< 84
Total Organic Carbon	2	mg/l	43	49
TPH		ug/l	-	-
EPH (C10-C40)	10	ug/l	440	570
Benzene	1	ug/l	< 1.0	< 1.0
Toluene	1	ug/l	< 1.0	< 1.0
Ethylbenzene	1	ug/l	< 1.0	< 1.0
m/p Xylenes		ug/l	-	-
o Xylene		ug/l	-	-
Xylene	1	ug/l	< 1.0	< 1.0
MTBE		ug/l	-	-
Acenaphthene	0.01	ug/l	< 0.01	< 0.01
Acenaphthylene	0.01	ug/l	< 0.01	< 0.01
Anthracene	0.01	ug/l	< 0.01	< 0.01
Benzo(a)anthracene	0.01	ug/l	< 0.01	< 0.01
Benzo(a)pyrene	0.01	ug/l	< 0.01	< 0.01
Benzo(b)fluoranthene	0.01	ug/l	< 0.01	< 0.01
Benzo(k)fluoranthene	0.01	ug/l	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.01	ug/l	< 0.01	< 0.01
Chrysene	0.01	ug/l	< 0.01	< 0.01
Dibenzo(a,h)anthracene	0.01	ug/l	< 0.01	< 0.01
Fluoranthene	0.01	ug/l	0.02	< 0.01
Fluorene	0.01	ug/l	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	0.01	ug/l	< 0.01	< 0.01
Naphthalene	0.01	ug/l	0.02	< 0.01
Phenanthrene	0.01	ug/l	0.02	< 0.01
Pyrene	0.01	ug/l	0.04	< 0.01
PAH	0.2	ug/l	< 0.20	< 0.20
Catechol	0.1	ug/l	< 0.10	< 0.10
Cresols	0.1	ug/l	< 0.10	< 0.10
Naphthols	0.1	ug/l	< 0.10	< 0.10
Phenol	0.1	ug/l	1.9	< 0.10
Resorcinol	0.1	ug/l	< 0.10	< 0.10
Dimethylphenols		ug/l	-	-
Trimethylphenol	0.1	ug/l	< 0.10	< 0.10
Xylenols & Ethylphenols	0.1	ug/l	< 0.10	< 0.10
Total Phenols	0.1	ug/l	1.9	< 0.10

		Lab No	586401	595060	595061	586400	595053	595054	586399	595055	595056	595062
		Sample ID	SS11-05-1	SS11-05-1	SS11-05-1D	SS11-06-1	SS11-06-1	SS11-06-1D	SS11-07-1	SS11-07-1	SS11-07-1D	SW1
		Area AC	1	1	1	1	1	1	1	1	1	1
		Other ID										
		Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampling Date	09/12/2013	09/01/14	09/01/14	09/12/2013	09/01/14	09/01/14	09/12/2013	09/01/14	09/01/14	09/01/14
		Sampling Time		n/s	n/s		n/s	n/s		n/s	n/s	n/s
Test	LOD	Units										
Arsenic, Dissolved	0.16	ug/l	0.91	0.69	0.59	0.85	1.2	1.2	0.98	0.68	0.76	0.95
Cadmium, Dissolved	0.03	ug/l	0.032	0.13	0.12	0.042	< 0.03	< 0.03	0.080	0.06	0.07	0.07
Chromium, Dissolved	0.25	ug/l	< 0.25	0.39	0.39	< 0.25	7.4	7.0	< 0.25	6.4	6.7	6.0
Copper, Dissolved	0.4	ug/l	1.1	1.9	2.6	2.5	3.5	3.1	3.6	5.5	5.7	3.3
Iron, Dissolved	5.5	ug/l	34	43	65	140	190	140	220	230	280	210
Lead, Dissolved	0.09	ug/l	0.37	0.42	0.55	0.72	0.83	0.38	0.26	0.33	0.58	0.41
Mercury, Dissolved	0.01	ug/l	< 0.010	< 0.01	< 0.01	< 0.010	< 0.01	< 0.01	< 0.010	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	0.5	ug/l	1.4	1.1	1.2	2.2	1.2	1.1	3.8	3.0	3.1	1.5
Selenium, Dissolved	0.25	ug/l	< 0.25	0.72	0.59	< 0.25	0.58	0.56	0.35	0.61	0.74	0.41
Zinc, Dissolved	1.25	ug/l	30.8	70.9	115	49.7	36.6	44.1	37.3	32.0	55.1	79.0
Calcium		ug/l	-	-	-	-	-	-	-	-	-	-
Magnesium		ug/l	-	-	-	-	-	-	-	-	-	-
Sodium		ug/l	-	-	-	-	-	-	-	-	-	-
Potassium		ug/l	-	-	-	-	-	-	-	-	-	-
Iron (Total)		ug/l	-	-	-	-	-	-	-	-	-	-
Manganese		ug/l	-	-	-	-	-	-	-	-	-	-
Conductivity	1	uS/cm	668	476	484	806	704	699	1400	1180	1190	659
pH			7.3	7.2	7.2	7.6	7.6	7.5	7.2	7.4	7.2	7.4
Cyanide total	40	ug/l	< 40	< 40	< 40	130	110	110	250	230	240	90
Cyanide free	20	ug/l	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Cyanide complex	40	ug/l	< 40	< 40	< 40	130	110	110	250	230	240	90
Thiocyanate	40	ug/l	< 40	64	45	< 40	< 40	570	< 40	< 40	48	< 40
Total Dissolved Solids		ug/l	-	-	-	-	-	-	-	-	-	-
Suspended Solids	5	mg/l	130	100	68	540	450	440	90	280	300	1300
Ammoniacal Nitrogen as N	0.015	mg/l	1.1	0.19	0.16	1.6	< 0.015	0.015	14	1.9	3.0	0.094
Total Nitrogen as N		ug/l	-	-	-	-	-	-	-	-	-	-
Nitrate		ug/l	-	-	-	-	-	-	-	-	-	-
Chloride	0.1	mg/l	8.6	28	28	5.1	20	22	4.6	35	35	23
Sulphate as SO4	0.1	mg/l	15	43	45	42	130	140	84	340	350	110
Sulphide	10	ug/l	< 10	< 10.0	12	< 10	< 10.0	15	< 10	11	< 10.0	11
Sulphur (free)	84	ug/l	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84
Total Organic Carbon	2	mg/l	8.1	9.7	8.3	34	20	29	18	30	31	48
TPH		ug/l	-	-	-	-	-	-	-	-	-	-
EPH (C10-C40)	10	ug/l	250	220	290	150	280	320	550	390	350	2500
Benzene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p Xylenes		ug/l	-	-	-	-	-	-	-	-	-	-
o Xylene		ug/l	-	-	-	-	-	-	-	-	-	-
Xylene	1	ug/l	< 0.01	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE		ug/l	-	-	-	-	-	-	-	-	-	-
Acenaphthene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Acenaphthylene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Benzo(a)anthracene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.02	0.04	< 0.01
Benzo(a)pyrene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	0.01	ug/l	< 0.01	< 0.01	0.02	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01
Indeno(1,2,3-c,d)pyrene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	0.01	ug/l	< 0.01	0.01	0.01	< 0.01	0.03	< 0.01	< 0.01	< 0.01	0.05	< 0.01
Phenanthrene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.07	0.03
Pyrene	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01	0.02	0.01	< 0.01	< 0.01	0.01	< 0.01
PAH	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.24	< 0.20
Catechol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Naphthols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dimethylphenols		ug/l	-	-	-	-	-	-	-	-	-	-
Trimethylphenol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Xylenols & Ethylphenols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Phenols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

		Lab No	593935	586402
		Sample ID	GP1	SS11-09-1
		Area AC	2	2
		Other ID		
		Sample Type	WATER	WATER
		Sampling Date	10/01/14	09/12/2013
		Sampling Time	n/s	
Test	LOD	Units		
Arsenic, Dissolved	0.16	ug/l	1.1	1.4
Cadmium, Dissolved	0.03	ug/l	< 0.030	0.040
Chromium, Dissolved	0.25	ug/l	0.63	< 0.25
Copper, Dissolved	0.4	ug/l	1.8	1.4
Iron, Dissolved	5.5	ug/l	190	36
Lead, Dissolved	0.09	ug/l	2.8	0.44
Mercury, Dissolved	0.01	ug/l	< 0.01	< 0.010
Nickel, Dissolved	0.5	ug/l	1.2	1.4
Selenium, Dissolved	0.25	ug/l	< 0.25	0.33
Zinc, Dissolved	1.25	ug/l	36.1	40.6
Calcium		ug/l	-	-
Magnesium		ug/l	-	-
Sodium		ug/l	-	-
Potassium		ug/l	-	-
Iron (Total)		ug/l	-	-
Manganese		ug/l	-	-
Conductivity	1	uS/cm	387	641
pH			7.2	7.6
Cyanide total	40	ug/l	< 40	< 40
Cyanide free	20	ug/l	< 20	< 20
Cyanide complex	40	ug/l	< 40	< 40
Thiocyanate	40	ug/l	< 40	< 40
Total Dissolved Solids		ug/l	-	-
Suspended Solids	5	mg/l	35000	88
Ammoniacal Nitrogen as N	0.015	mg/l	28	0.42
Total Nitrogen as N		ug/l	-	-
Nitrate		ug/l	-	-
Chloride	0.1	mg/l	27	12
Sulphate as SO4	0.1	mg/l	2.6	11
Sulphide	10	ug/l	< 10.0	< 10
Sulphur (free)	84	ug/l	< 90.0	< 84
Total Organic Carbon	2	mg/l	250	11
TPH		ug/l	-	-
EPH (C10-C40)	10	ug/l	42000	11000
Benzene	1	ug/l	< 1.0	< 1.0
Toluene	1	ug/l	< 1.0	< 1.0
Ethylbenzene	1	ug/l	< 1.0	< 1.0
m/p Xylenes		ug/l	-	-
o Xylene		ug/l	-	-
Xylene	1	ug/l	< 1.0	< 1.0
MTBE		ug/l	-	-
Acenaphthene	0.01	ug/l	< 0.01	2.4
Acenaphthylene	0.01	ug/l	< 0.01	< 0.01
Anthracene	0.01	ug/l	< 0.01	2.7
Benzo(a)anthracene	0.01	ug/l	0.02	0.67
Benzo(a)pyrene	0.01	ug/l	0.06	0.50
Benzo(b)fluoranthene	0.01	ug/l	0.03	0.64
Benzo(k)fluoranthene	0.01	ug/l	0.02	0.29
Benzo(g,h,i)perylene	0.01	ug/l	0.01	0.27
Chrysene	0.01	ug/l	< 0.01	0.31
Dibenzo(a,h)anthracene	0.01	ug/l	< 0.01	0.27
Fluoranthene	0.01	ug/l	0.02	2.9
Fluorene	0.01	ug/l	< 0.01	4.9
Indeno(1,2,3-c,d)pyrene	0.01	ug/l	0.09	0.52
Naphthalene	0.01	ug/l	< 0.01	3.7
Phenanthrene	0.01	ug/l	< 0.01	1.1
Pyrene	0.01	ug/l	0.06	2.6
PAH	0.2	ug/l	0.37	24
Catechol	0.1	ug/l	< 0.10	< 0.10
Cresols	0.1	ug/l	< 0.10	< 0.10
Naphthols	0.1	ug/l	< 0.10	< 0.10
Phenol	0.1	ug/l	< 0.10	< 0.10
Resorcinol	0.1	ug/l	< 0.10	< 0.10
Dimethylphenols		ug/l	-	-
Trimethylphenol	0.1	ug/l	< 0.10	< 0.10
Xylenols & Ethylphenols	0.1	ug/l	< 0.10	< 0.10
Total Phenols	0.1	ug/l	< 0.10	< 0.10

		Lab No	587738	588503	593983
		Sample ID	SS1103-1	SS11-03-1	SS11-03-1
		Area AC	3	3	3
		Other ID			
		Sample Type	WATER	WATER	WATER
		Sampling Date	11/12/2013	13/12/2013	09/01/14
		Sampling Time			n/s
Test	LOD	Units			
Arsenic, Dissolved	0.16	ug/l	0.67	0.73	0.93
Cadmium, Dissolved	0.03	ug/l	0.058	0.056	0.10
Chromium, Dissolved	0.25	ug/l	1.9	0.41	5.3
Copper, Dissolved	0.4	ug/l	1.4	2.2	3.6
Iron, Dissolved	5.5	ug/l	210	21	100
Lead, Dissolved	0.09	ug/l	1.4	0.28	0.79
Mercury, Dissolved	0.01	ug/l	< 0.010	< 0.010	< 0.01
Nickel, Dissolved	0.5	ug/l	< 0.50	2.6	1.1
Selenium, Dissolved	0.25	ug/l	0.60	0.45	0.87
Zinc, Dissolved	1.25	ug/l	67.1	49.0	142
Calcium		ug/l	-	-	-
Magnesium		ug/l	-	-	-
Sodium		ug/l	-	-	-
Potassium		ug/l	-	-	-
Iron (Total)		ug/l	-	-	-
Manganese		ug/l	-	-	-
Conductivity	1	uS/cm	469	434	369
pH			7.3	7.5	7.6
Cyanide total	40	ug/l	< 40	< 40	< 40
Cyanide free	20	ug/l	< 20	< 20	< 20
Cyanide complex	40	ug/l	< 40	< 40	< 40
Thiocyanate	40	ug/l	< 40	< 40	< 40
Total Dissolved Solids		ug/l	-	-	-
Suspended Solids	5	mg/l	10000	140	33
Ammoniacal Nitrogen as N	0.015	mg/l	1.6	0.27	0.057
Total Nitrogen as N		ug/l	-	-	-
Nitrate		ug/l	-	-	-
Chloride	0.1	mg/l	16	15	20
Sulphate as SO4	0.1	mg/l	26	32	26
Sulphide	10	ug/l	< 10	< 10	< 10.0
Sulphur (free)	84	ug/l	< 84	< 84	< 84
Total Organic Carbon	2	mg/l	110	16	4.5
TPH		ug/l	-	-	-
EPH (C10-C40)	10	ug/l	1900	1200	260
Benzene	1	ug/l	< 1.0	< 1.0	< 1.0
Toluene	1	ug/l	< 1.0	< 1.0	< 1.0
Ethylbenzene	1	ug/l	< 1.0	< 1.0	< 1.0
m/p Xylenes		ug/l	-	-	-
o Xylene		ug/l	-	-	-
Xylene	1	ug/l	< 1.0	< 1.0	< 1.0
MTBE		ug/l	-	-	-
Acenaphthene	0.01	ug/l	< 0.01	< 0.01	0.01
Acenaphthylene	0.01	ug/l	< 0.01	< 0.01	< 0.01
Anthracene	0.01	ug/l	0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	ug/l	0.21	0.22	< 0.01
Benzo(a)pyrene	0.01	ug/l	0.17	0.30	< 0.01
Benzo(b)fluoranthene	0.01	ug/l	0.14	0.19	< 0.01
Benzo(k)fluoranthene	0.01	ug/l	0.10	0.22	< 0.01
Benzo(g,h,i)perylene	0.01	ug/l	0.16	0.27	< 0.01
Chrysene	0.01	ug/l	0.09	0.13	< 0.01
Dibenzo(a,h)anthracene	0.01	ug/l	0.05	< 0.01	< 0.01
Fluoranthene	0.01	ug/l	0.23	0.28	< 0.01
Fluorene	0.01	ug/l	0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	0.01	ug/l	0.23	0.36	< 0.01
Naphthalene	0.01	ug/l	0.26	< 0.01	< 0.01
Phenanthrene	0.01	ug/l	0.05	0.07	0.01
Pyrene	0.01	ug/l	0.31	0.63	0.02
PAH	0.2	ug/l	2.0	2.7	< 0.20
Catechol	0.1	ug/l	< 0.10	< 0.10	< 0.10
Cresols	0.1	ug/l	< 0.10	< 0.10	< 0.10
Naphthols	0.1	ug/l	< 0.10	< 0.10	< 0.10
Phenol	0.1	ug/l	< 0.10	< 0.10	< 0.10
Resorcinol	0.1	ug/l	< 0.10	< 0.10	< 0.10
Dimethylphenols		ug/l	-	-	-
Trimethylphenol	0.1	ug/l	< 0.10	< 0.10	< 0.10
Xylenols & Ethylphenols	0.1	ug/l	< 0.10	< 0.10	< 0.10
Total Phenols	0.1	ug/l	< 0.10	< 0.10	< 0.10

		Lab No	588504	593985	587083	593363	587081	593362	587082	593936	587084	593361	588502	620867	620868	620869	620870	620871
		Sample ID	BED UP	CULVUP	SS11-01-1	SS11-01-1	SS11-02-1	SS11-02-1	SS11-02-3	SS11-08-1	SS11-08-1	SS11-08-1	UPCUV	AC 4-11	SS 11-02-1	SS 11-02-3	RBI SS 11-08-1	
		Area AC Other ID	4	4	4	4	4	4	4	4	4	4	4					
		Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampling Date	13/12/2013	09/01/14	10/12/2013	09/01/14	10/12/2013	09/01/14	10/12/2013	10/01/14	10/12/2013	09/01/14	10/12/2013	12/03/14	12/03/14	12/03/14	12/03/14	12/03/14
		Sampling Time	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a					
Test	LOD	Units																
Arsenic, Dissolved	0.16	ug/l	1.2	1.1	1.7	0.98	1.1	2.0	1.2	1.3	1.0	1.1	1.3	1.5	2.8	2.0	1.3	
Cadmium, Dissolved	0.03	ug/l	0.038	0.03	0.080	0.045	<0.030	0.041	<0.030	0.065	0.050	0.034	<0.030	<0.03	<0.03	<0.03	<0.03	<0.03
Chromium, Dissolved	0.25	ug/l	0.46	7.2	0.48	10	0.33	7.0	<0.25	0.35	7.3	0.49	0.48	0.47	0.79	0.45	0.34	
Copper, Dissolved	0.4	ug/l	3.4	6.3	1.7	2.9	5.5	0.80	3.0	2.5	2.9	1.8	2.9	1.8	1.8	1.0	3.0	
Iron, Dissolved	5.5	ug/l	48	180	35	51	73	220	70	45	70	500	40	150	91	9900	120	
Lead, Dissolved	0.09	ug/l	0.62	0.95	0.10	0.47	0.64	2.1	0.38	0.56	0.69	3.9	0.21	0.34	0.58	0.21	1.7	1
Mercury, Dissolved	0.01	ug/l	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel, Dissolved	0.5	ug/l	1.9	3.4	1.7	3.4	1.7	3.4	1.7	3.4	2.3	2.6	2.3	2.6	2.3	2.6	2.3	5.0
Selenium, Dissolved	0.25	ug/l	<0.25	0.30	0.27	0.61	0.25	0.33	0.45	1.1	0.25	0.25	<0.25	0.3	0.27	0.3	0.5	0.28
Zinc, Dissolved	1.25	ug/l	<10.0	71.0	16.0	37.2	28.0	29.2	10.0	155	62.0	65.5	50.4	37.8	27.5	47.3	59.8	74.1
Calcium	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (Total)	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	1	us/cm	605	363	514	385	588	352	503	564	597	343	594	982	547	400	1490	565
pH	-	-	7.9	7.7	7.8	7.9	8.1	8.1	8.0	7.3	8.0	8.4	8.0	6.8	7.4	7.5	6.7	7.2
Cyanide total	40	ug/l	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	41	<40	<40	51	<40
Cyanide free	20	ug/l	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Cyanide complex	40	ug/l	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	41	<40	<40	51	<40
Thiocyanate	40	ug/l	<40	<40	<40	<40	<40	250	<40	<40	<40	<40	<40	<40	<40	<40	54	44
Total Dissolved Solids	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Suspended Solids	5	ug/l	48	180	35	19	31	70	31	440	110	<5.0	46	32	48	15	6	38000
Ammoniacal Nitrogen as N	0.015	mg/l	0.16	0.43	0.48	0.058	0.16	0.21	0.45	1.1	0.17	0.16	0.26	1.8	0.094	0.95	3.9	0.12
Total Nitrogen as N	-	mg/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	0.1	mg/l	35	31	46	19	38	44	46	45	49	130	36	40	34	39	15	34
Sulphate as SO4	0.1	mg/l	48	24	54	36	55	33	60	70	41	41	49	170	38	46	540	43
Sulphide	10	ug/l	<10	<10.0	<10	<10.0	<10	15	<10	<10.0	<10	<10	<10	<10	<10	<10	<10	<10
Sulphur (free)	84	ug/l	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84	<84
Total Organic Carbon	2	mg/l	13	18	6.7	3.4	13	19	13	13	11	20	11	8.1	14	4.1	1000	14
TPH	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPH (C10-C40)	10	ug/l	240	170	130	200	120	200	130	430	140	550	210	270	110	260	240	100
Benzene	1	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	1	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	1	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m,p Xylenes	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
o Xylene	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene	1	ug/l	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MTBE	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	0.01	ug/l	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	1.2	<0.01	<0.01	<0.01	7.0	0.01	0.01	0.16	<0.01
Acenaphthylene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	0.01	ug/l	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.32	0.07	<0.01	0.06	0.24	0.02	0.01	0.13	<0.01
Benzo(a)anthracene	0.01	ug/l	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.02	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01
Benzo(b)fluoranthene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	<0.01
Benzo(k)fluoranthene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01
Benzofluorene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	0.01	ug/l	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.07	<0.01	<0.01
Dibenz(a,h)anthracene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	0.01	ug/l	0.10	<0.01	0.09	<0.01	0.12	<0.01	0.09	0.27	<0.01	<0.01	0.08	0.44	0.23	0.34	0.15	0.02
Indeno(1,2,3-c)pyrene	0.01	ug/l	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.67	<0.01	0.04	2.1	0.03	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-d)pyrene	0.01	ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Naphthalene	0.01	ug/l	<0.01	0.01	<0.01	<0.01	0.03	<0.01	0.09	0.19	0.03	<0.01	0.18	0.68	<0.01	0.79	0.36	<0.01
Phenanthrene	0.01	ug/l	0.13	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	0.08	<0.01	<0.01	0.18	0.06	<0.01	0.03	0.03	<0.01
Pyrene	0.01	ug/l	0.14	<0.01	0.12	<0.01	<0.01	<0.31	0.06	0.31	0.06	0.14	0.40	0.11	0.10	0.13	0.06	<0.01
PAH	0.2	ug/l	0.51	<0.20	0.26	<0.20	0.35	<0.20	0.36	3.1	<0.20	<0.20	0.60	1.1	0.68	2.6	1.1	<0.20
Catechol	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cresols	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Naphthols	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenol	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Resorcinol	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dimethylphenols	-	ug/l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylphenol	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Xylenols & Ethylphenols	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Phenols	0.1	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

		Lab No	587739	595057	587740	595058	587741	595059	588500	588501
		Sample ID	Upstream	UPSTREAM	Downstream	DOWNSTREAM	OX-B	OX-BOW	TB1	FB1
		Depth								
		Other ID								
		Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sampling Date	11/12/2013	09/01/14	11/12/2013	09/01/14	11/12/2013	09/01/14	13/12/2013	13/12/2013
		Sampling Time		n/s		n/s		n/s		
Test	LOD	Units								
Arsenic, Dissolved	0.16	ug/l	0.66	0.69	0.42	0.72	0.87	0.91	0.43	< 0.16
Cadmium, Dissolved	0.03	ug/l	0.28	0.15	0.29	0.15	0.21	0.18	< 0.030	< 0.030
Chromium, Dissolved	0.25	ug/l	7.9	6.6	5.9	8.2	1	7.7	0.35	0.67
Copper, Dissolved	0.4	ug/l	3.9	3.7	1.6	4	0.8	5.1	1.5	1.3
Iron, Dissolved	5.5	ug/l	170	110	31	110	450	85	9.2	16
Lead, Dissolved	0.09	ug/l	2.2	3.2	0.82	2.3	2.1	1.7	0.26	0.25
Mercury, Dissolved	0.01	ug/l	< 0.010	< 0.01	< 0.010	0.01	< 0.010	< 0.01	< 0.010	< 0.010
Nickel, Dissolved	0.5	ug/l	1.3	1.5	0.67	1.7	1.2	2	0.86	1
Selenium, Dissolved	0.25	ug/l	0.33	< 0.25	0.27	0.28	0.35	0.25	< 0.25	< 0.25
Zinc, Dissolved	1.25	ug/l	48.5	81.6	52.1	104	63.5	62.2	99.6	30.9
Conductivity	1	uS/cm	672	359	670	356	794	448	1.4	1
pH			8.2	7.6	8.2	7.7	7.4	7.7	7.4	6.7
Cyanide total	40	ug/l	< 40	< 40	< 40	< 40	43	< 40	< 40	< 40
Cyanide free	20	ug/l	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Cyanide complex	40	ug/l	< 40	< 40	< 40	< 40	43	< 40	< 40	< 40
Thiocyanate	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Suspended Solids	5	mg/l	46	58	6	48	55	44	< 5.0	< 5.0
Ammoniacal Nitrogen as N	0.015	mg/l	0.75	1.5	0.17	0.43	0.66	0.29	0.13	0.15
Chloride	0.1	mg/l	41	25	41	23	32	24	1.9	1.4
Sulphate as SO4	0.1	mg/l	69	29	69	31	100	56	4.9	2.7
Sulphide	10	ug/l	< 10	13	< 10	< 10.0	< 10	< 10.0	< 10	< 10
Sulphur (free)	84	ug/l	< 84	< 84	< 84	< 84	< 84	< 84	< 84	< 84
Total Organic Carbon	2	mg/l	4.9	9.8	3.8	10	18	10	< 2.0	< 2.0
TPH		ug/l	-	-	-	-	-	-	-	-
EPH (C10-C40)	10	ug/l	280	300	360	97	440	190	180	160
Benzene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m/p Xylenes		ug/l	-	-	-	-	-	-	-	-
o Xylene		ug/l	-	-	-	-	-	-	-	-
MTBE		ug/l	-	-	-	-	-	-	-	-
Acenaphthene	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	0.01	ug/l	0.11	< 0.01	0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	0.01	ug/l	< 0.01	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	0.01	ug/l	0.05	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Fluorene	0.01	ug/l	0.13	< 0.01	0.01	< 0.01	0.03	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	0.01	ug/l	0.07	< 0.01	0.05	0.02	0.04	< 0.01	< 0.01	< 0.01
Phenanthrene	0.01	ug/l	0.24	< 0.01	0.02	< 0.01	0.05	< 0.01	< 0.01	< 0.01
Pyrene	0.01	ug/l	0.05	< 0.01	0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
PAH	0.2	ug/l	0.67	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Catechol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dimethylphenols		ug/l	-	-	-	-	-	-	-	-
Naphthols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trimethylphenol	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Xylenols & Ethylphenols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Phenols	0.1	ug/l	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

		Lab No.	591842
		Sample ID	TP32
		Depth	2.00
		Sample Ref	
		Sample Type	
		Sampling Date	02/12/2013
		Sample Horizon	MG
Test	Units	LOD	
BS EN 12457 10:1			Y
Arsenic, Dissolved	ug/l	0.16	3.4
Cadmium, Dissolved	ug/l	0.03	< 0.030
Chromium, Dissolved	ug/l	0.25	< 0.25
Copper, Dissolved	ug/l	0.4	< 0.40
Iron, Dissolved	ug/l	5.5	8.4
Lead, Dissolved	ug/l	0.09	0.12
Mercury, Dissolved	ug/l	0.01	< 0.010
Nickel, Dissolved	ug/l	0.5	0.93
Selenium, Dissolved	ug/l	0.25	< 0.25
Zinc, Dissolved	ug/l	1.25	3.57
Conductivity	uS/cm	1	55.8
pH			8.4
Cyanide total	ug/l	40	< 40
Cyanide free	ug/l	20	< 20
Cyanide complex	ug/l	40	< 40
Thiocyanate	ug/l	40	< 40
Ammoniacal Nitrogen as N	mg/l	0.015	1.4
Chloride	mg/l	0.1	2.1
Sulphate as SO4	mg/l	0.1	8
Sulphide	ug/l	10	< 10
Sulphur (free)	ug/l	84	< 84
Total Organic Carbon	mg/l	2	7.5
EPH (C10-C40)	ug/l	10	2400
TPH	ug/l		-
Benzene	ug/l	1	2
Toluene	ug/l	1	2
Ethylbenzene	ug/l	1	11
Xylene	ug/l	1	24
Acenaphthene	ug/l	0.01	240
Acenaphthylene	ug/l	0.01	< 0.01
Anthracene	ug/l	0.01	22
Benzo(a)anthracene	ug/l	0.01	1.4
Benzo(a)pyrene	ug/l	0.01	1.4
Benzo(b)fluoranthene	ug/l	0.01	0.85
Benzo(k)fluoranthene	ug/l	0.01	0.37
Benzo(g,h,i)perylene	ug/l	0.01	1.2
Chrysene	ug/l	0.01	0.98
Dibenzo(a,h)anthracene	ug/l	0.01	< 0.01
Fluoranthene	ug/l	0.01	23
Fluorene	ug/l	0.01	67
Indeno(1,2,3-c,d)pyrene	ug/l	0.01	1.3
Naphthalene	ug/l	0.01	31
Phenanthrene	ug/l	0.01	110
Pyrene	ug/l	0.01	23
PAH	ug/l	0.2	520
Catechol	ug/l	0.1	< 0.10
Cresols	ug/l	0.1	< 0.10
Dimethylphenols	ug/l		-
Naphthols	ug/l	0.1	< 0.10
Phenol	ug/l	0.1	< 0.10

Resorcinol	ug/l	0.1	< 0.10
Trimethylphenol	ug/l	0.1	< 0.10
Xylenols & Ethylphenols	ug/l	0.1	< 0.10
Total Phenols	ug/l	0.1	< 0.10
Suspended Solids	mg/l	5	-

Appendix H
Refurbishment & Demolition Survey (Asbestos)



HSE Licence No.
081205279

A & D ENVIRONMENTAL SERVICES
LIMITED
ASBESTOS REMOVAL SPECIALISTS
ASBESTOS SURVEYORS • THERMAL INSULATION
UNIT E36, ASHMOUNT ENTERPRISE PARK, ABER ROAD, FLINT, CH6 5YL
TEL: 01352 734498 • FAX: 01352 731863 • Email: sales@adenv.co.uk
www.ad-asbestosremoval.co.uk

Refurbishment & Demolition Survey for Asbestos Content Materials

**Former District Office
Former Gas Works
Maelor Works
Marchweil
Wrexham, LL13 0UW**



Report No. KW / Q2652 / 13

F.A.O:

Mr. James Wood

Address:

**I & H Brown Ltd
PO Box 51
Dunkeld Road
Perth, PH1 3YD**

Survey Date/s: 09 / December / 2013

Report Date: 13 / December / 2013

Surveyor - Kevin Williams



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

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Bulk Sample Analysis Method	4.2
██	████
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Former District Office, Maelor Works, Marchweil, Wrexham	5.1
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██	████
██	████
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ENVIRONMENTAL SERVICES
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**Refurbishment & Demolition
Asbestos Survey Report**

1.0 Introduction

At the request of Mr. James Wood (I & H Brown Ltd)
A & D Environmental Services Ltd were instructed to undertake a Refurbishment & Demolition (as per guidelines HSG 264 "The Surveyors Guide") to locate and identify Asbestos Containing Materials (ACMs) within the confines of Former District Office, Former Gas Works, Maelor Works, Marchweil, Wrexham LL13 0UW.

The Survey findings have been correlated in Section 4.5 – 4.24. This section will show photos of the area sampled (Visually or analytically). Along with all pertinent information with regard to: The location (also marked on the site plans), a Risk Assessment of any ACMs' found (Comprising of a Material and Priority Algorithm), Laboratory Analysis Results and any specific comments with regard to the sample location(s).

Any Asbestos Containing Materials (ACMs') located within the confines of Former District Office, Former Gas Works, Maelor Works, Marchweil, Wrexham LL13 0UW will be listed in the Summary and any observations / recommendations that are necessary.



**Refurbishment & Demolition
Asbestos Survey Report**

**2.0 The Purpose, Aims and Objectives of a Refurbishment &
Demolition Asbestos Survey**

A Refurbishment & Demolition Asbestos Survey will require, as far as is reasonably practicable, the Asbestos Type, Product Type, Location and Extent of all identified or presumed Asbestos Containing Materials (ACMs) to be recorded. Where the client has specified, the Accessibility, Condition of, and any Surface Treatment of all known or presumed ACMs' will also be recorded.

Asbestos Type and Product Type may be recorded by visual identification and/or identification through laboratory analysed samples taken at the time of surveying. A Refurbishment & Demolition Asbestos Survey will involve intrusive / destructive investigation into the fabric of the properties / premises to, as far as is reasonably practicable, identify any (ACMs).

A full sampling programme is undertaken to identify possible ACMs and estimates of the volume and surface area of ACMs will be made. The survey will not record the condition of the Asbestos other than to note areas of damage where debris may be expected to be present.

As the properties / premises are to be subjected to demolition there is no need to record the Accessibility, Surface Treatment and Extent of Damage of any ACMs located during the survey.



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

3.0 A General Site Overview

Former District Office, Former Gas Works, Maelor Works, Marchweil, Wrexham LL13 0UW comprises of single level brick built structure with flat felted roof over stramit board roof panels, Asbestos containing materials to internal and external areas to be located and identified within this report.

3.1 Areas not accessed.

2 x safes located within rear lobby not accessed.

Access to high level main flat roof not permitted at time of survey.

Live electrical equipment not accessed due to safety and technical considerations.

Underground service ducts not accessed due to technical access considerations.

Presume to contain Asbestos containing materials (ACMs) until proved otherwise.



4.0 Site Survey Results

[illegible]

[illegible]



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**Refurbishment & Demolition
Asbestos Survey Report**

[REDACTED]

4.4 General Survey Information

Client: Mr. James Wood

I & H Brown Ltd
PO Box 51
Dunkeld Road
Perth, PH1 3YD



4.5 Sample Results, Algorithm and Recommendations

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.6 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Ladies changing room and toilets – Vinyl floor covering Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 02
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Vinyl floor covering to ladies changing room and toilets. Approx 55m ²		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
Material Assessment Algorithm Score:	N/A		
Priority Assessment Algorithm Score:	N/A		
Total Algorithm Assessment Scores:	N/A		
Comments / Recommendations:	Vinyl floor covering to ladies changing room and toilets sampled and found to contain no Asbestos material. [REDACTED]		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.7 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Men's toilets – Cistern to void behind urinals Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 03
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Cistern to void behind urinals. 1 x cistern		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
Material Assessment Algorithm Score:	N/A		
Priority Assessment Algorithm Score:	N/A		
Total Algorithm Assessment Scores:	N/A		
Comments / Recommendations:	Cistern to void behind urinals within men's toilets sampled and found to contain no Asbestos material. [REDACTED]		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.8 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Men's toilets – Cleaners store – Floor tiles Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 04
Analysis Results:	Chrysotile – (White Asbestos)		
Item / Material & Quantity:	Asbestos content double layered floor tiles (Black & Beige) to Men's toilets – Cleaners store floor Approx 8m ² in total.		
Surface Treatment:	None - Poor Condition.		
Photograph Taken:			
Material Assessment Algorithm Score:	4		
Priority Assessment Algorithm Score:	4		
Total Algorithm Assessment Scores:	8 – Low Risk		
Comments / Recommendations:	Asbestos content floor tiles are in poor condition [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]		
Marked on Plans:	Yes		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.9 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Room 1 store - next to ladies toilets. Ceiling. Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 05
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Textured coating (Artex) to ceiling Approx 20m ² in total.		
Surface Treatment:	Painted – Fair Condition		
Photograph Taken:			
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
Comments / Recommendations:	Textured coating (Artex) to ceiling within Room 1 store sampled and found to contain no Asbestos material. ██████████ ██		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.10 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Room 1 store - next to ladies toilets. Sink. Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 06
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Bituminous sink pad to underside of sink. 1 x sink pad		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
██████████ ██████████ ██████████	██████████		
██████████ ██████████ ██████████	██████████		
██████████ ██████████ ██████████	██████████		
Comments / Recommendations:	Bituminous sink pad to underside of sink sampled and found to contain no Asbestos material. ██████████.		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.11 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Maintenance Stores – Floor tiles Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 07
Analysis Results:	Chrysotile – (White Asbestos)		
Item / Material & Quantity:	Asbestos content grey floor tiles under beige vinyl floor tiles to Maintenance Stores flooring Approx 12m ² in total.		
Surface Treatment:	None - Poor Condition.		
Photograph Taken:			
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
Comments / Recommendations:	Asbestos content floor tiles are in poor condition [REDACTED] [REDACTED]. [REDACTED] [REDACTED] [REDACTED] [REDACTED]		
Marked on Plans:	Yes		

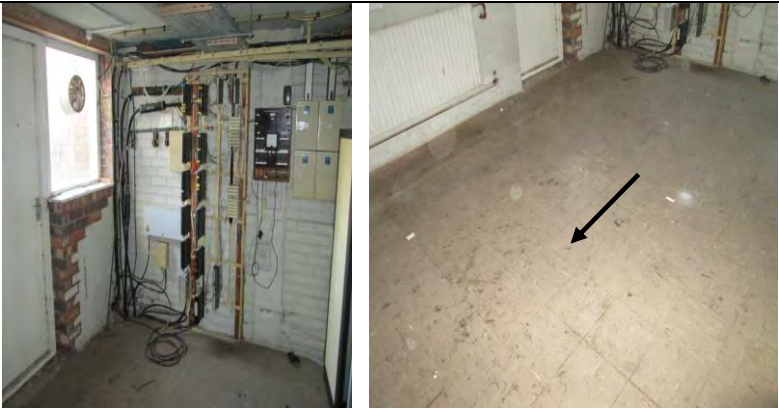
(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.12 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Room 2 - behind trade union room. Flooring. Easy Access.		
Sample Taken:	Yes	Sample No.:	MWW / 08
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Floor tiles (Beige) throughout Room 2. Approx 28m ² in total.		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
██████████ ██████████ ██████████	██████████		
██████████ ██████████ ██████████	██████████		
██████████ ██████████ ██████████	██████████		
Comments / Recommendations:	Floor tiles (Beige) throughout Room 2 sampled and found to contain no Asbestos material. ██████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.13 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Room 2 - behind trade union room. Skylight surround. Difficult Access.		
Sample Taken:	Yes	Sample No.:	MWW / 09
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Felt surrounding flashing to skylights above ceiling. Approx 10m ² in total.		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
██████████ ██████████ ██████████	██████████		
██████████ ██████████ ██████████	██████████		
██████████ ██████████ ██████████	██████████		
Recommendations:	Felt surrounding flashing to skylights sampled and found to contain no Asbestos material. ██████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.14 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Kitchen – Under sink unit near window Asbestos Insulation Board (AIB) . Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 10
Analysis Results:	Amosite / Chrysotile – (Brown & White Asbestos)		
Item / Material & Quantity:	Asbestos Insulation Board (AIB) panelling to disposal unit under left side sink. Approx 1m ² in total.		
Surface Treatment:	None - Poor Condition.		
Photograph Taken:			
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
Recommendations:	Asbestos Insulation Board (AIB) is in poor untreated condition [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]		
Marked on Plans:	Yes		

(For Algorithm Definitions see Section 4.3)



4.15 Sample Results, Algorithm and Recommendations

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.16 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Felt DPC to external wall void. Fair / Difficult Access.		
Sample Taken:	Yes	Sample No.:	MWW / 12
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Felt type damp proof membrane throughout internal to external wall voids.		
Surface Treatment:	None – Poor Condition		
Photograph Taken:			
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
██████████	██████████		
Comments / Recommendations:	Felt type damp proof membrane sampled and found to contain no Asbestos material. ██████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.17 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Front entrance lobby – Ceiling coating Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 13
Analysis Results:	Chrysotile – (White Asbestos)		
Item / Material & Quantity:	Asbestos content textured coating (Artex) to entrance lobby vestibule ceiling. Approx 8m ² in total.		
Surface Treatment:	Painted - Good Condition.		
Photograph Taken:			
Material As	█		
	█		
	█		
	█		
	█		
Recommendations:	Asbestos content textured coating (Artex) to entrance lobby ceiling is in good condition █ █ █ █ █		
Marked on Plans:	Yes		

(For Algorithm Definitions see Section 4.3)



4.18 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Main Boiler Room. Ceiling tiles to grid. Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 14
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Ceiling tiles to main boiler room suspended grid. Approx 14m ² in total. Visually typical of superlux tiles.		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
Material Assessment			
Comments / Recommendations:	Ceiling tiles to main boiler room suspended grid sampled and found to contain no Asbestos material. No [REDACTED] [REDACTED]		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.19 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Main Boiler Room. Pipe work flange gaskets. Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 15
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Gaskets within boiler service pipe work flange joints.		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
██████████ ██████████████ ██████████████████	██████████		
██████████ ██████████████ ██████████████████	██████████		
██████████ ██████████████ ██████████████████	██████████		
Comments / Recommendations:	Gaskets within boiler service pipe work flange joints sampled and found to contain no Asbestos material. ██████████ ██████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.20 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Main Boiler Room. Rear and side walls, residues. Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 16
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Residues to main boiler room rear and side walls behind pipe work.		
Surface Treatment:	None – Poor Condition		
Photograph Taken:			
██████ ██████████ ██████████████	████		
██████ ██████████ ██████████████	████		
██████████████ ██████████████ ██████████	████		
Comments / Recommendations:	Residues to main boiler room rear and side walls behind pipe work sampled and found to contain no Asbestos material. █████ ████████████████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



4.21 Sample Results, Algorithm and Recommendations

(For Algorithm Definitions see Section 4.3)



4.22 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Plant Room. Ceiling tiles to grid and wall tiles. Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 18
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Ceiling tiles and wall tiles to plant room. Approx 18m ² in total. Visually typical of superlux tiles.		
Surface Treatment:	None – Fair Condition		
Photograph Taken:			
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
[REDACTED]	[REDACTED]		
Comments / Recommendations:	Ceiling and wall tiles within plant room sampled and found to contain no Asbestos material. [REDACTED]		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.23 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Plant Room. Rear wall, residues. Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 19
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Residues to plant room rear wall behind pipe work.		
Surface Treatment:	None – Poor Condition		
Photograph Taken:			
██████████ ██████████████████ ██████████████████████	██████████		
██████████ ██████████████████ ██████████████████████	██████████		
██████████████████ ██████████████████ ██████████	██████████		
Comments / Recommendations:	Residues to plant room rear wall behind pipe work sampled and found to contain no Asbestos material. ██████████ ██████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

4.24 Sample Results, Algorithm and Recommendations

Area / Location / Accessibility:	Former District Office. Maelor Works – Wrexham. Main flat roof above offices. Fair Access.		
Sample Taken:	Yes	Sample No.:	MWW / 20
Analysis Results:	NADIS – No Asbestos Detected In Sample		
Item / Material & Quantity:	Roofing felt covering to main flat roof above offices.		
Surface Treatment:	None – Good Condition		
Photograph Taken:			
██████████ ██████████████ ██████████████████	██████████		
██████████ ██████████████ ██████████████████	██████████		
██████████████ ██████████████ ██████████	██████████		
Comments / Recommendations:	Roofing felt covering to main flat roof above offices sampled and found to contain no Asbestos material. ██████████ ██████████		
Marked on Plans:	No		

(For Algorithm Definitions see Section 4.3)



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**Refurbishment & Demolition
Asbestos Survey Report**

Summary

This survey has identified 4 locations that contain or presumes to contain ACMs'.

1. GF Men's toilets – Cleaners store room – Floor tiles. Approx 8m² in total.
2. GF Maintenance Stores – Floor tiles under vinyl tiles. Approx 12m² in total.
3. GF Kitchen – Disposal unit under sink – **Asbestos Insulation Board (AIB)**
Approx 1m² in total.
4. GF main entrance lobby ceiling – Textured coating (Artex).
Approx 8m² in total.



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

Recommendations :-

Asbestos Insulation Board (AIB) is in poor condition [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED].

Asbestos content textured coating (Artex) to lobby ceiling [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Asbestos floor tiles are in fair / poor condition [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

5.1 Table to show ACMs detected at :

Former District Office, Former Gas Works, Maelor Works, Marchweil, Wrexham - LL13 0UW.

Sample Number:	Building	Material Location:	Type of Material:	Quantity:	Analysis Results / Visual ID:
MWW / 04	Former District Office, Maelor Works	GF Men's toilets – Cleaners store room	Floor tiles	Approx 8m ²	Chrysotile – (White Asbestos)
MWW / 07	Former District Office, Maelor Works	GF Maintenance Stores	Floor tiles	Approx 12m ²	Chrysotile – (White Asbestos)
MWW / 10	Former District Office, Maelor Works	GF Kitchen – Under Sink	Asbestos Insulation Board (AIB)	Approx 1m ²	Amosite / Chrysotile – (Brown & White Asbestos)
MWW / 13	Former District Office, Maelor Works	GF Entrance lobby ceiling	Textured coating (Artex)	Approx 8m ²	Chrysotile – (White Asbestos)



6.0 Appendix

[illegible]



6.2 [REDACTED]

[illegible]



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

6.3 Caveat

Although every effort has been made by the survey team to examine all materials, it cannot be guaranteed that all Asbestos Containing Materials (ACMs') have been located and identified. Some materials concealed within the fabric of the building may also contain Asbestos and only be detected during refurbishment or demolition works. Materials behind structural walls, under block or concrete flooring or behind asbestos sheeting have not been examined. Areas requiring specialist access equipment, other than stepladders up to a height of 3.0 metres have not been accessed.

Every reasonable effort has been made to ensure that the information contained in this report is as accurate and as comprehensive as was practicable at the time of preparation. However due to the nature of Asbestos surveying techniques, it is not reasonably practicable to categorically state whether an area is free of all ACMs'.

A & D Environmental Services Ltd cannot therefore accept liability for loss, injury, damage or penalty caused by omissions or errors in this report. The report does not waive the responsibility of the Building Owner, Duty Holder, Contractor(s), etc., to ascertain the composition of materials that may be disturbed or with which they may work.

Certain Asbestos products contain asbestos fibres that are so well bound into the matrix of the material that they do not readily generate airborne asbestos fibres under reasonably foreseeable circumstances. Examples of such materials include sealing mastics, rubber gaskets, vinyl floor tiles and damp proof membranes.



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

Certain 'Artex' type coatings and decorative plasters may contain very small quantities of asbestos. In-situ these coatings are often composed of different batches of product or may have been repaired / patched at different times. It is therefore possible that any 'Artex' samples taken may not be representative of the entire coating. This may also apply to vast areas of boarding. If asbestos is found within any of the afore mentioned products the whole area should be managed as if ACMs'.

It is possible that unidentified asbestos residues resulting from earlier asbestos removal works may be present in relatively inaccessible locations. E.g. Behind column claddings, attached to earlier ceiling tile grids or suspension systems or covered



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Summary of General Requirements Regarding Asbestos Containing Materials

Asbestos Coatings / Insulations

- A. Work with Asbestos materials is subject to the Control of Asbestos Regulations 2012, and any subsequent amendments or date triggered Regulations.
- B. Guidance can be obtained within the HSE Approved Code of Practice – Work with Asbestos Insulation, Asbestos Coating and Asbestos Insulating Board, Second Edition.
- C. Work must only be undertaken by contractors licensed under the Asbestos (Licensing) Regulations 1983. (Subject to limited exceptions).
- D. 14 Days prior notification of work with ACMs' must be given to the enforcing authority under Regulation 9 of the Control of Asbestos Regulations 2012
- E. Air monitoring during the removal, and clearance certification upon completion should be undertaken using a UKAS accredited laboratory.
- F. These materials are classified as "Hazardous Waste" and requires pre-notification of movement to the Environment Agency. All ACMs' must be disposed of in accordance with the 2005 Hazardous Waste Regulations.

Asbestos Insulating Board (AIB)

- A. Work with AIB is subject to the Control of Asbestos Regulations 2012 and any subsequent amendments or date triggered Regulations.
- B. Guidance for major work can be obtained within the HSE Licensed Contractors Guidance HSG247



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

- C. It is compulsory that a contractor licensed under; The Control of Asbestos Regulations 2012 should undertake any work with AIB.
- D. Air monitoring during the removal, and clearance certification upon completion should be undertaken using a UKAS accredited laboratory.
- E. These materials are classified as "Hazardous Waste" and requires pre-notification of movement to the Environment Agency. All ACMs' must be disposed of in accordance with the 2005 Hazardous Waste Regulations.

Asbestos Cement / Woven Asbestos Materials

- A. Work with these materials is subject to the Control of Asbestos Regulations 2012 and any subsequent amendments or date triggered Regulations.
- B. Guidance can be obtained within the HSE Guidance Note EM9 Asbestos Essentials.
- C. Asbestos Cement (AC) is classified as a 'Hazardous Waste' for the purposes of disposal.



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

6.4 Certificate of Analysis:



CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

STANDARD ☐
PREMIUM ☐
EMERGENCY ☐

Client:	A & D ENVIRONMENTAL SERVICES LIMITED			Analysis Report No.	SCO/13/35501		
Address:	UNIT E36 ASHMOUNT ENTERPRISE PARK ABER ROAD FLINT FLINTSHIRE CH6 5YL			Report Date:	12/12/13		
Attention:	TONY SIMPSON			Site Ref No.	N/A		
Site Address:	MAELOR WORKS WREXHAM			Page No:	1	Of	2
Date sample taken:	09/12/13			No. of Samples:	20		
Date sample received:	12/12/13			Obtained:	DELIVERED		
Date of Analysis:	12/12/13						

Samples of material, referenced below, have been examined to determine the presence of asbestos fibres, using Scopes Asbestos Analysis "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on HSE's HSG248. If samples have been DELIVERED the site address and actual sample location is as given by the client at the time of delivery. Scopes Asbestos Analysis Services Limited are not responsible for the accuracy or competence of the sampling by third parties. Under these circumstances Scopes Asbestos Analysis Services Limited cannot be held responsible for the interpretation of the results shown.

SCOPE'S SAMPLE No.	CLIENT SAMPLE	Sample Location	Fibre Type Detected
1	MWW/01	COVERED WALKWAY – VINYL FLOOR COVERING	NADIS
2	MWW/02	LADIES CHANGING ROOM – VINYL FLOOR COVERING	NADIS
3	MWW/03	MEN'S TOILET – TOILET CISTERN	NADIS
4	MWW/04	MEN'S TOILET – CLEANER STORE – FLOOR TILE	CHRYSTOLE TO BITUMEN BACKING ONLY
5	MWW/05	ROOM 1 STORES – TEXTURED COATING TO CEILING	NADIS
6	MWW/06	ROOM 1 STORE – SINK PAD	NADIS
7	MWW/07	MAINTENANCE STORES – FLOOR TILE	CHRYSTOLE TO BITUMEN BACKING ONLY
8	MWW/08	ROOM 7 – FLOOR TILE	NADIS
9	MWW/09	ROOM 1 – FELT SURROUND TO SKYLIGHT	NADIS
10	MWW/10	KITCHEN UNDER SINK UNIT – INSULATION BOARDING	AMOSITE/CHRYSTOLE

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.

Note: This Certificate for Identification of Asbestos Fibres shall not be reproduced except in full without the written approval of the Laboratory.

Analysed by:	M.ZHOU	Authorised signatory:	
		Print names:	S BOLTON- Q.C.M

BULK 001-VER 5 12-AUGUST-09-QCM



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report



CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

STANDARD ☐
PREMIUM ☐
EMERGENCY ☐

Client:	A & D ENVIRONMENTAL SERVICES LIMITED		
Address:	UNIT E36 ASHMOUNT ENTERPRISE PARK ABER ROAD FLINT FLINTSHIRE CH6 5YL		
Attention:	TONY SIMPSON		
Site Address:	MAELOR WORKS WREXHAM		
Date sample taken:	09/12/13		
Date sample received:	12/12/13		
Date of Analysis:	12/12/13		
Analysis Report No.	SCQ/13/35501		
Report Date:	12/12/13		
Site Ref No.	N/A		
Page No:	2	Of	2
No. of Samples:	20		
Obtained:	DELIVERED		

Samples of material, referenced below, have been examined to determine the presence of asbestos fibres, using Scopes Asbestos Analysis "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on HSE's HSG248. If samples have been DELIVERED the site address and actual sample location is as given by the client at the time of delivery. Scopes Asbestos Analysis Services Limited are not responsible for the accuracy or competence of the sampling by third parties. Under these circumstances Scopes Asbestos Analysis Services Limited cannot be held responsible for the interpretation of the results shown.

SCOPEs SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
11	MWW/11	ROOM 4 – STAIR NOSING	NADIS
12	MWW/12	EXTERNAL WALLS – DAMP PROOF MEMBRANE	NADIS
13	MWW/13	ENTRANCE LOBBY – TEXTURED COATING TO CEILING	CHRYSTOTILE
14	MWW/14	MAIN BOILER ROOM – CEILING TILE	NADIS
15	MWW/15	MAIN BOILER ROOM – FLANGE GASKET	NADIS
16	MWW/16	MAIN BOILER ROOM – RESIDUE TO WALLS	NADIS
17	MWW/17	MAIN BOILER ROOM – FLOOR TILE	NADIS
18	MWW/18	PLANT ROOM – CEILING AND WALL TILES	NADIS
19	MWW/19	PLANT ROOM – RESIDUE TO WALL	NADIS
20	MWW/20	EXTERNAL FLAT ROOF – ROOF FELT	NADIS

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.

Note: This Certificate for Identification of Asbestos Fibres shall not be reproduced except in full without the written approval of the Laboratory.

Analysed by:	W.JEfferies	Authorised signatory:	
		Print name:	S BOLTON- Q.C.M

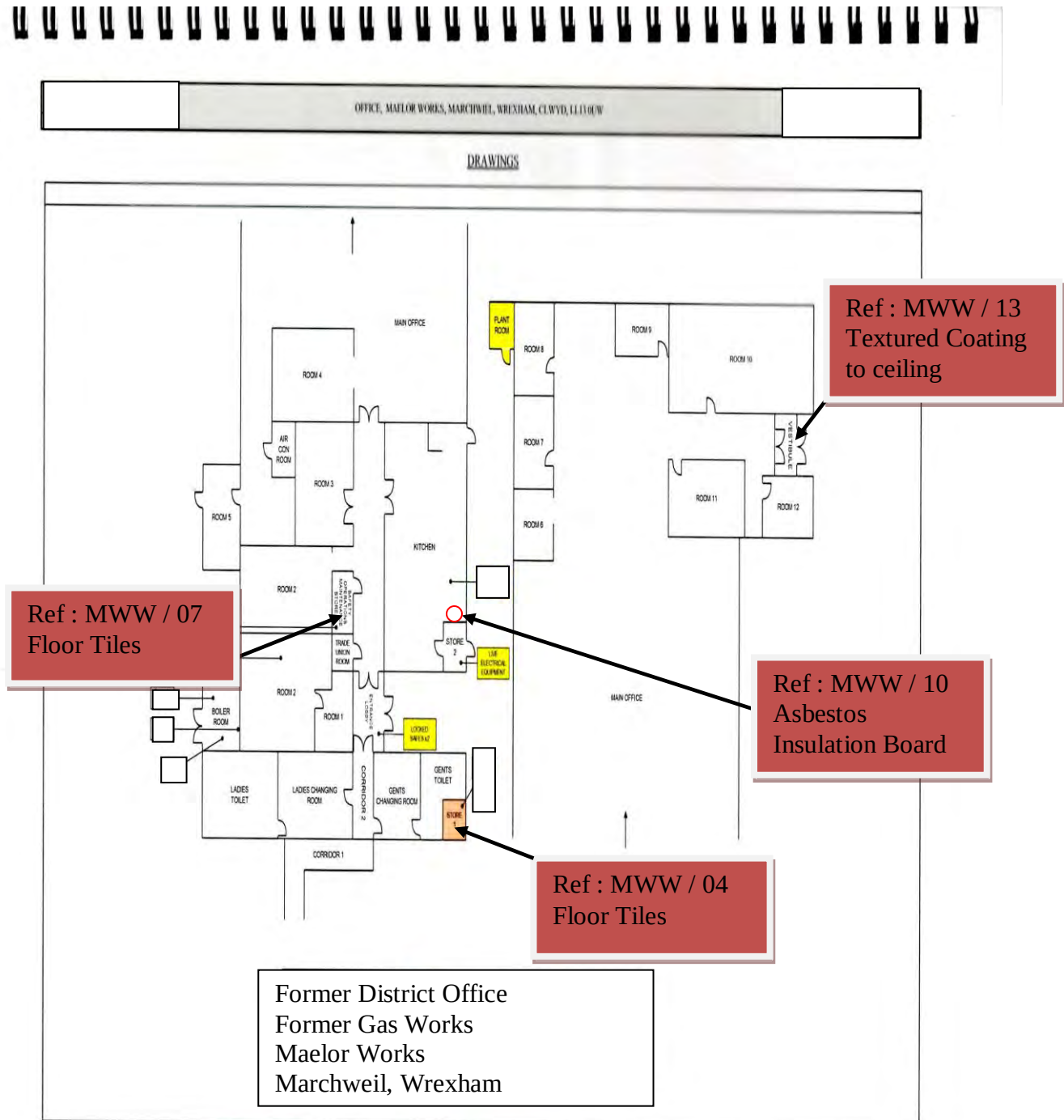
BULK 001-VER 5 12-AUGUST-09-QCM



ENVIRONMENTAL SERVICES LIMITED

Refurbishment & Demolition Asbestos Survey Report

6.5 Plan :



Appendix I
Photographic Records

List of Plates:

AC1

Plate 1: River Clywedog (receptor) - looking west upstream with flooded ox-bow lake on left where site outfall is located (07-01-2014).

Plate 2: Blocked drain leading to outfall to ox-bow lake located North of SS11-06-1 (10-12-2014).

Plate 3: French drain Interceptor NW Corner SS11-07-1 (10-12-2014).

Plate 4: French Drain (SS11-07-1) NW Boundary – Looking North (10-12-2014).

Plate 5: Looking East along the site Northern boundary towards SW2/SS11-05-1. Track has flowing water from a leaking water main on site flowing off site onto neighbouring farm land (10-12-2014).

Plate 6: Leaking Water Service on Northern boundary track SS11-05-01 (10-12-2014).

Plate 7: Leaking Water Service on Northern boundary track SS11-05-01 (10-12-2014).

AC2

Plate 8: BH2 - Training Centre – Window sample (approx 1m sample liner length 26-11-13)

Plate 9: BH23 Garage – Window sample (approx 1m sample liner lengths 09-12-2013)

Plate 10: TP1 South of Garage (29-11-2013)

Plate 11: TP6 Example of Material for Treatment (28-11-2013)

Plate 12: TP10 West of Training Centre (27-11-2013)

Plate 13: MW11-08B Groundwater by Garage (12-12-2013)

AC3

Plate 14: Looking East from Outfall SS11-03-01 onto pond located in SW Corner (13-12-2013)

Plate 15: Contamination on pond water surface from outfall SS11-03-01 onto pond located in SW Corner (13-12-2013)

Plate 16: Contamination on pond water surface from outfall SS11-03-01 onto pond located in SW Corner (13-12-2013)

AC4

Plate 17: Blocked Culvert upstream of Bedwell Tip (12-12-2013)

Plate 18: Blocked culvert -only one side flowing by Bedwell Tip (12-12-2013)

Plate 19: Blocked Culvert in eastern area of Bedwell Brook at site boundary by entrance to site (12-12-2013)

Plate 20: Leachate Outbreak besides outfall pipe into Brook at Bedwell Tip (12-12-2013)

Plate 21: Leachate Outbreak besides outfall pipe into Brook at Bedwell Tip (12-12-2013)

Plate 22: Staining in brook bank by tip and marked as RB1 on plan (12-12-2013)

Plate 23: Bedwell Brook Sediment SD2 (10-12-2013)

Plate 24: Bedwell Brook Sediment SD2 (10-12-2013)

Plate 25: Bedwell Brook Sediment SD2 (10-12-2013)

Plate 26: Bedwell Brook Sediment SD2 (10-12-2013)

Plate 27: Bedwell Brook Sediment SD4 (10-12-2013)

Plate 28: Waste on Bedwell Brook Banks (10-12-2013)

Plate 29: Area B West TP45 (04-12-2013)

AC1

Plate 1: River Clywedog (receptor) - looking west upstream with flooded ox-bow lake on left where site outfall is located (07-01-2014).



Plate 2: Blocked drain leading to outfall to ox-bow lake located North of SS11-06-1 (10-12-2014).



Plate 3: French drain Interceptor NW Corner SS11-07-1 (10-12-2014).



Plate 4: French Drain (SS11-07-1) NW Boundary – Looking North (10-12-2014).



Plate 5: Looking East along Northern boundary towards SW2/SS11-05-1. Track has flowing water from a leaking water main on site flowing off site onto neighbouring farm land (10-12-2014).



Plate 6: Leaking Water Main on Northern boundary track SS11-05-01 (10-12-2014).



Plate 7: Leaking Water Service on Northern boundary track SS11-05-01 (10-12-2014).



AC2

Plate 8: BH2 - Training Centre – Window sample (approx 1m sample liner length 26-11-13)



Plate 9: BH23 Garage – Window sample (approx 1m sample liner lengths 09-12-2013)



Plate 10: TP1 South of Garage (29-11-2013)



Plate 11: TP6 – Example of Material for Treatment (28-11-2013)



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Plate 13: MW11-08B Groundwater by Garage (12-12-2013)



AC3

Plate 14: Looking East from Outfall SS11-03-01 onto pond located in SW Corner (13-12-2013)



Plate 15: Contamination on pond water surface from outfall (13-12-2013)



Plate 16: Contamination on pond water surface from outfall (13-12-2013)



AC4

Plate 17: Blocked Culvert upstream of Bedwell Tip (12-12-2013)



Plate 18: Blocked culvert -only one side flowing by Bedwell Tip (12-12-2013)



Plate 19: Blocked Culvert in eastern area of Bedwell Brook at site boundary by entrance to site (12-12-2013)



Plate 20: Leachate Outbreak besides outfall pipe into Brook at Bedwell Tip (12-12-2013)



Plate 21: Leachate Outbreak besides outfall pipe into Brook at Bedwell Tip (12-12-2013)



Plate 22: Staining in brook bank by tip and marked as RB1 on plan (12-12-2013)



Plate 23: Bedwell Brook Sediment SD2 (10-12-2013)

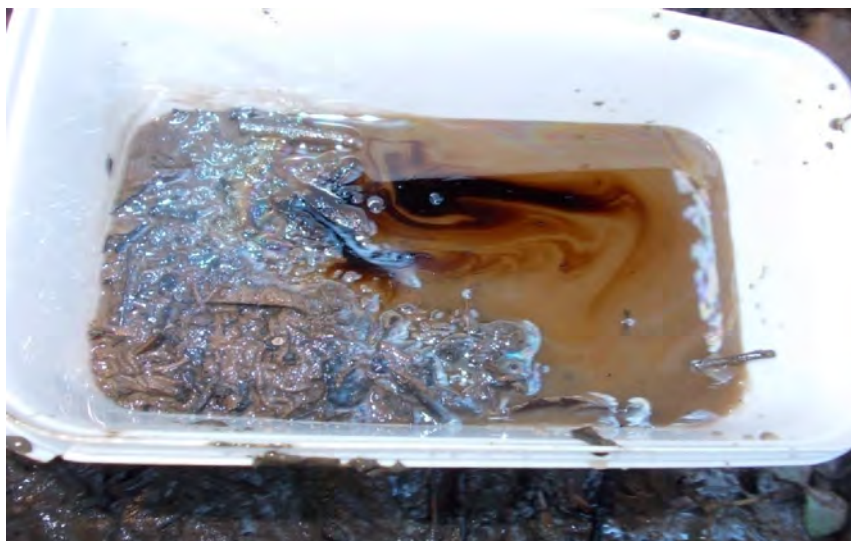


Plate 24: Bedwell Brook Sediment SD2 (10-12-2013)



Plate 25: Bedwell Brook Sediment SD2 (10-12-2013)



Plate 26: Bedwell Brook Sediment SD2 (10-12-2013)



Plate 27: Bedwell Brook Sediment SD4 (10-12-2013)



Plate 28: Waste on Bedwell Brook Banks (10-12-2013)

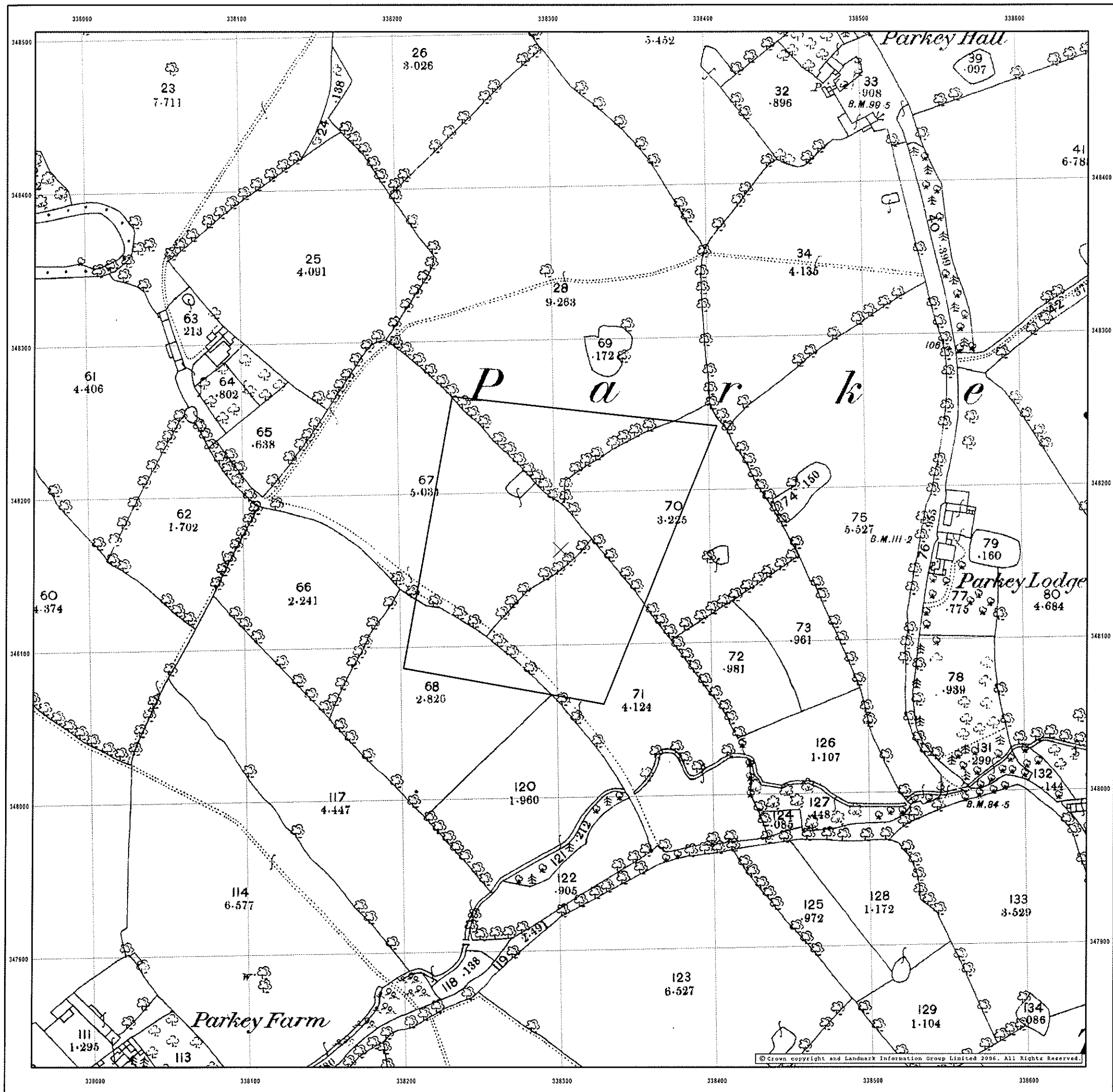


Plate 29: Area B West TP45



Appendix J

Historical Maps



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:44)

Customer Ref: C Coldrey, 50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

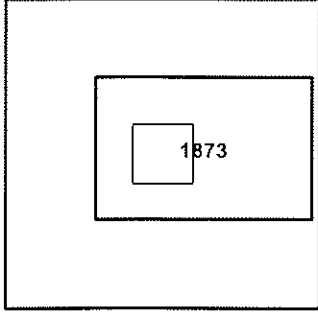
Historical Map Legend

Quarry	Sand Pit	Marsh	Reeds
Gravel Pit	Clay Pit	Rough Pasture	Furze
Refuse Heap	Shingle	Osiers	Ford
Railway crossing River or Canal	Railway crossing Road	Level Crossing	
Embankment	Cutting	Road crossing Railway	
Road over single Stream	Road over River or Canal	Arrow denotes flow of Water	

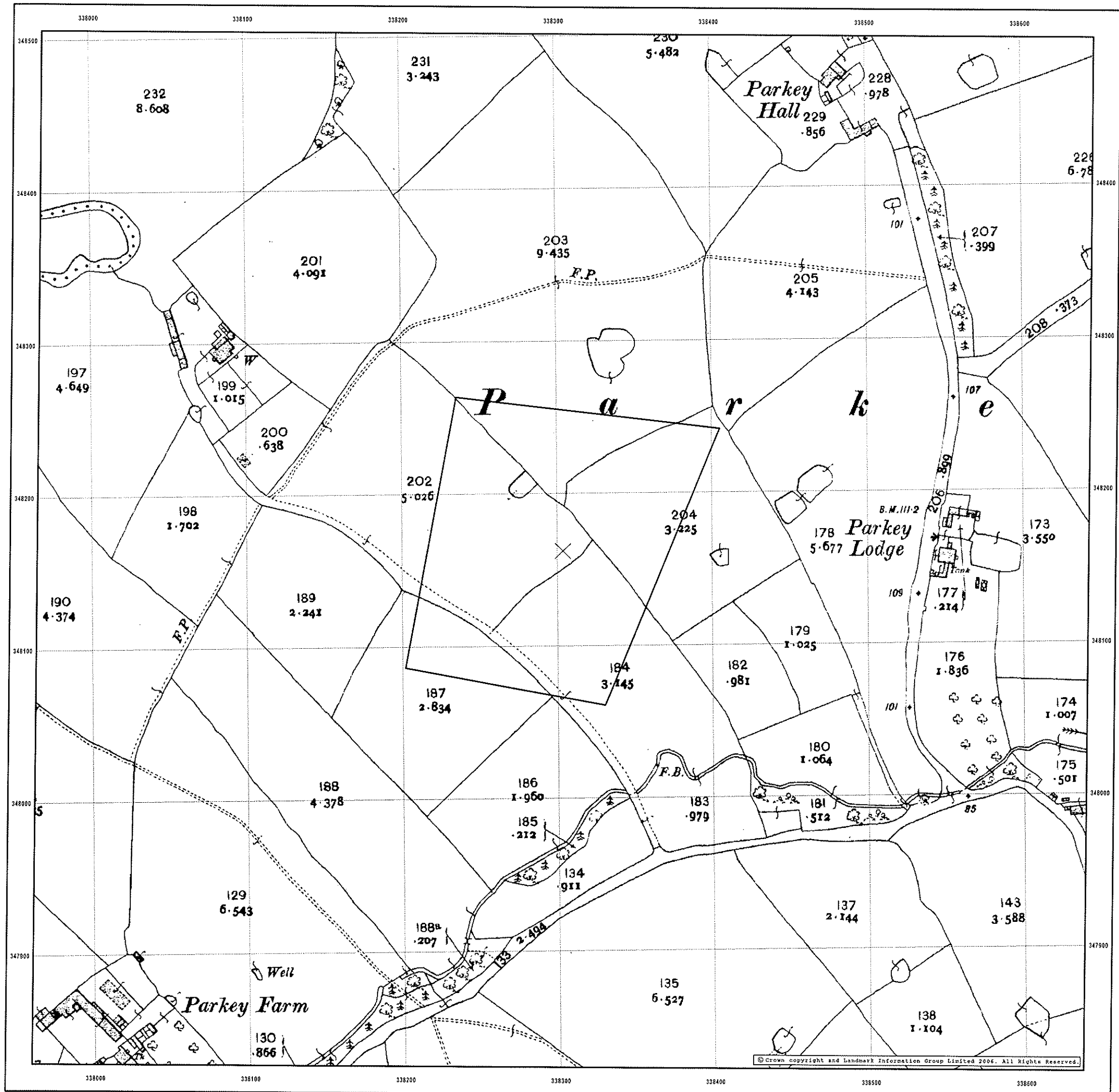
Ordnance Survey County Series 1

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1895 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1936, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

DENBIGHSHIRE
Published 1873
Source map scale - 1:2,500



Date(s) of Publication 1 of 24



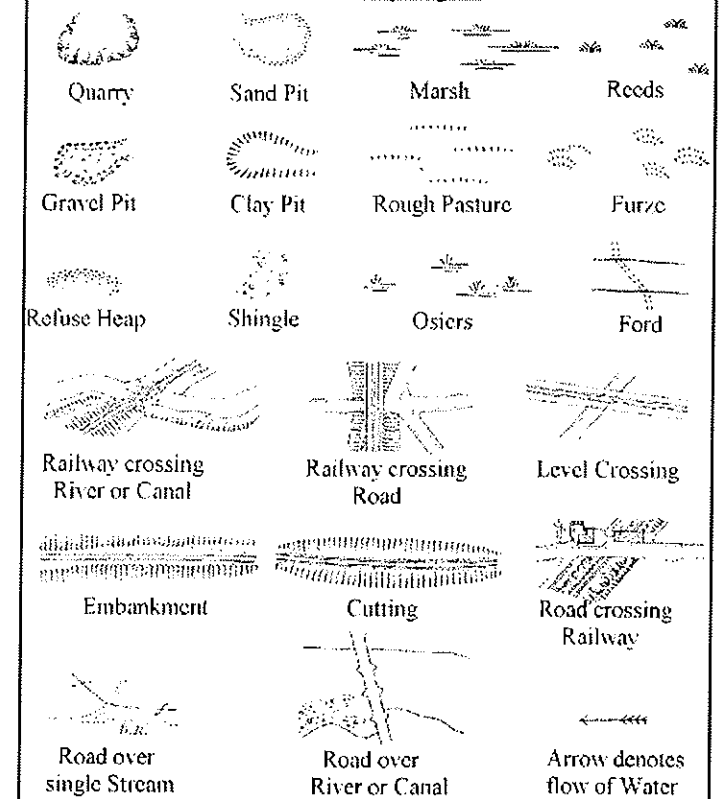
CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(19-Apr-2006 15:45)

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

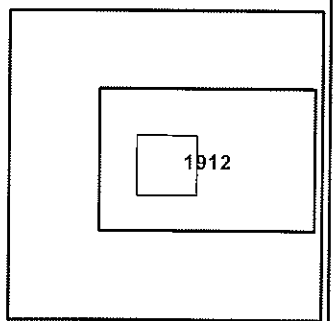
Historical Map Legend



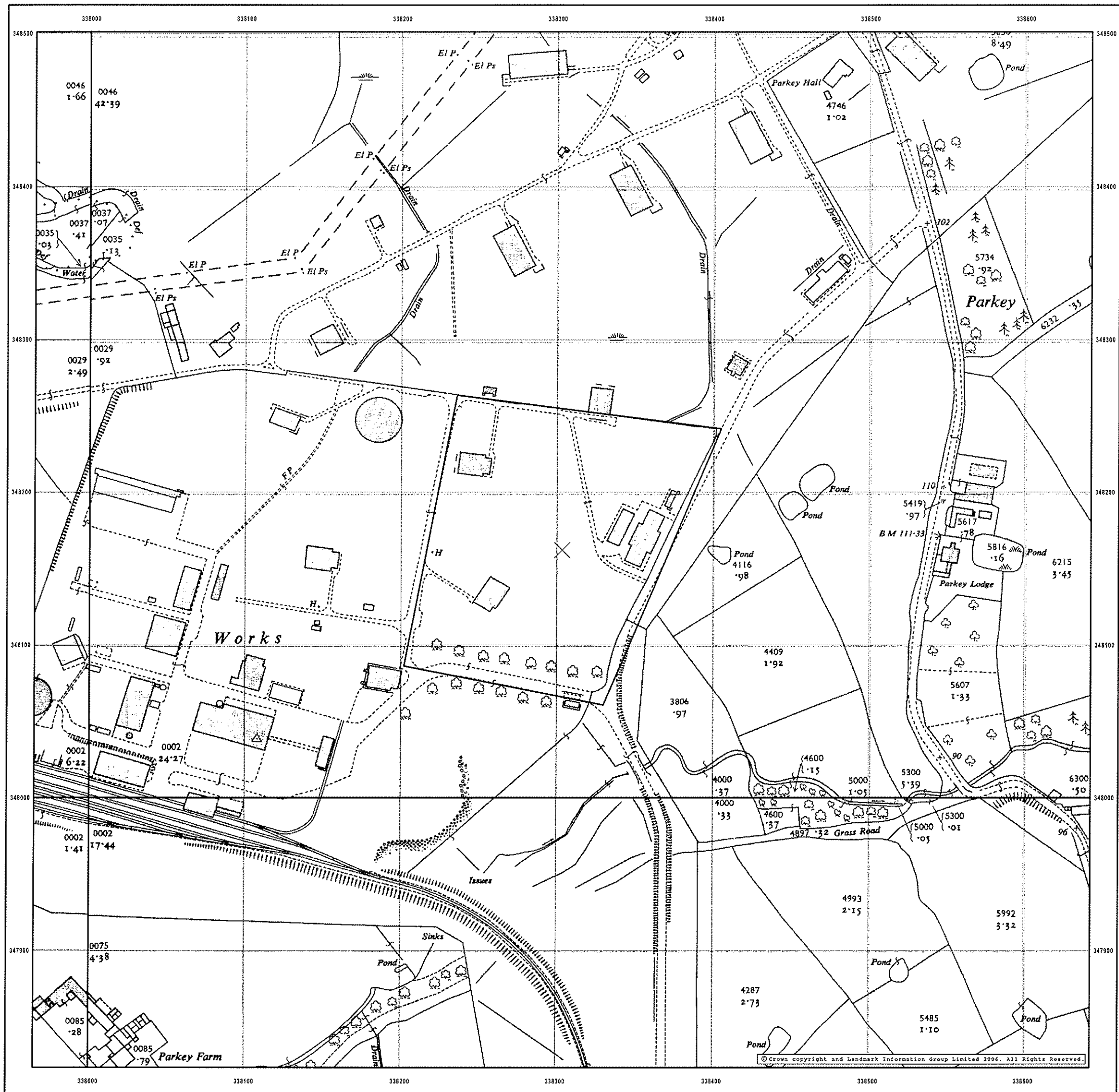
Ordnance Survey County Series 3

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

DENBIGHSHIRE
Published 1912
Source map scale - 1:2,500



Date(s) of Publication 3 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(19-Apr-2006 13:45)

Customer Ref: C Coldrey, 50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

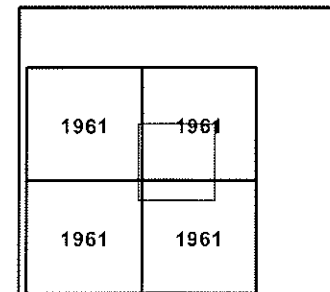
Bristol City
Bristol BS3 2BA

Historical Map Legend

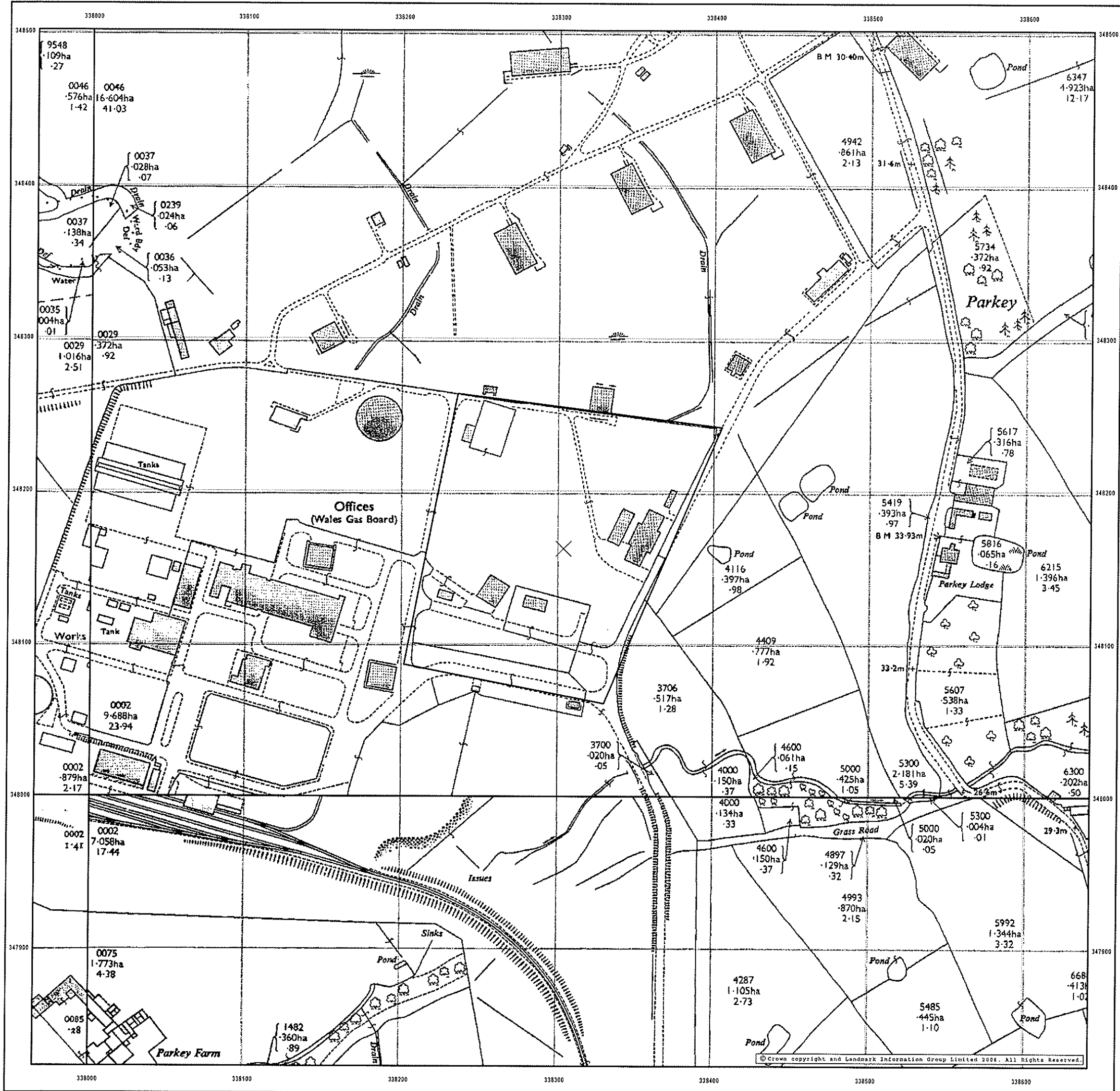
Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert
Slope	Slope	
Pylon	Electricity Transmission Line	Direction of Water flow
Marsh	Saltings	Orchard Tree
Rough Grassland	Scrub	Heath
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)
Non-coniferous Tree (Not Surveyed)		

Ordnance Survey Plan 1
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1886 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given on the right is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

ORDNANCE SURVEY PLAN
Published 1961
Source map scale - 1:2,500



Date(s) of Publication 4 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2004 15:43)

Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert
Slope	Slope	
Pylon	Electricity Transmission Line	Direction of Water flow
Marsh	Saltings	Orchard Tree
Rough Grassland	Scrub	Heath
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)
Non-coniferous Tree (Not Surveyed)		

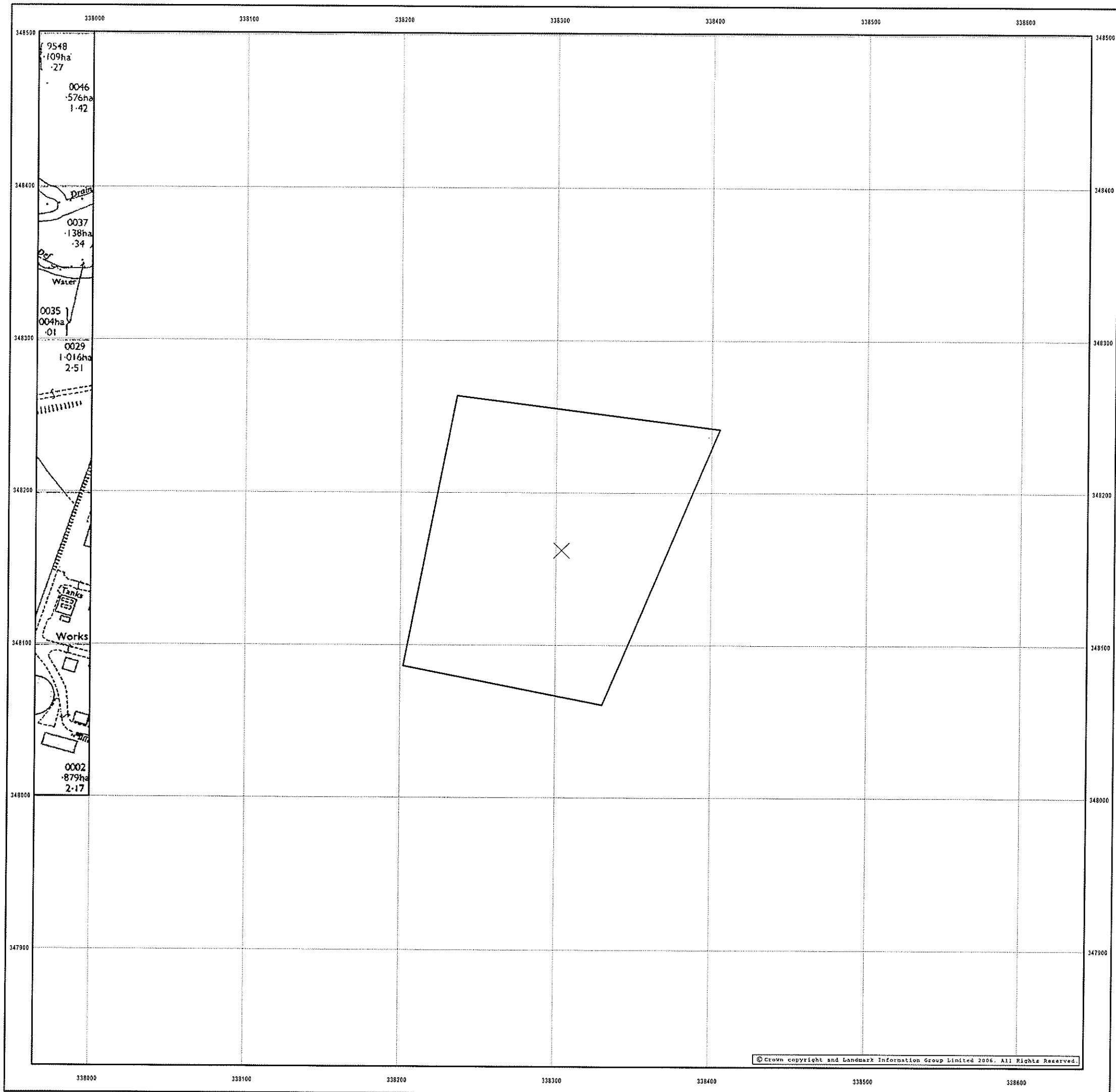
Additional SIMs

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

ORDNANCE SURVEY PLAN
Published 1961 to 1987
Source map scale - 1:2,500

1961	1961
1987	1961

Date(s) of Publication 5 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:45)
Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol

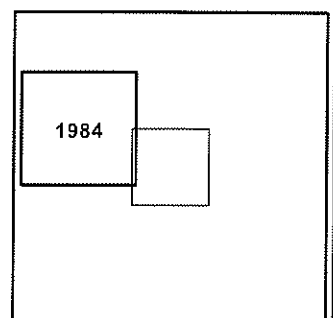
Bristol City
Bristol BS3 2BA

Historical Map Legend

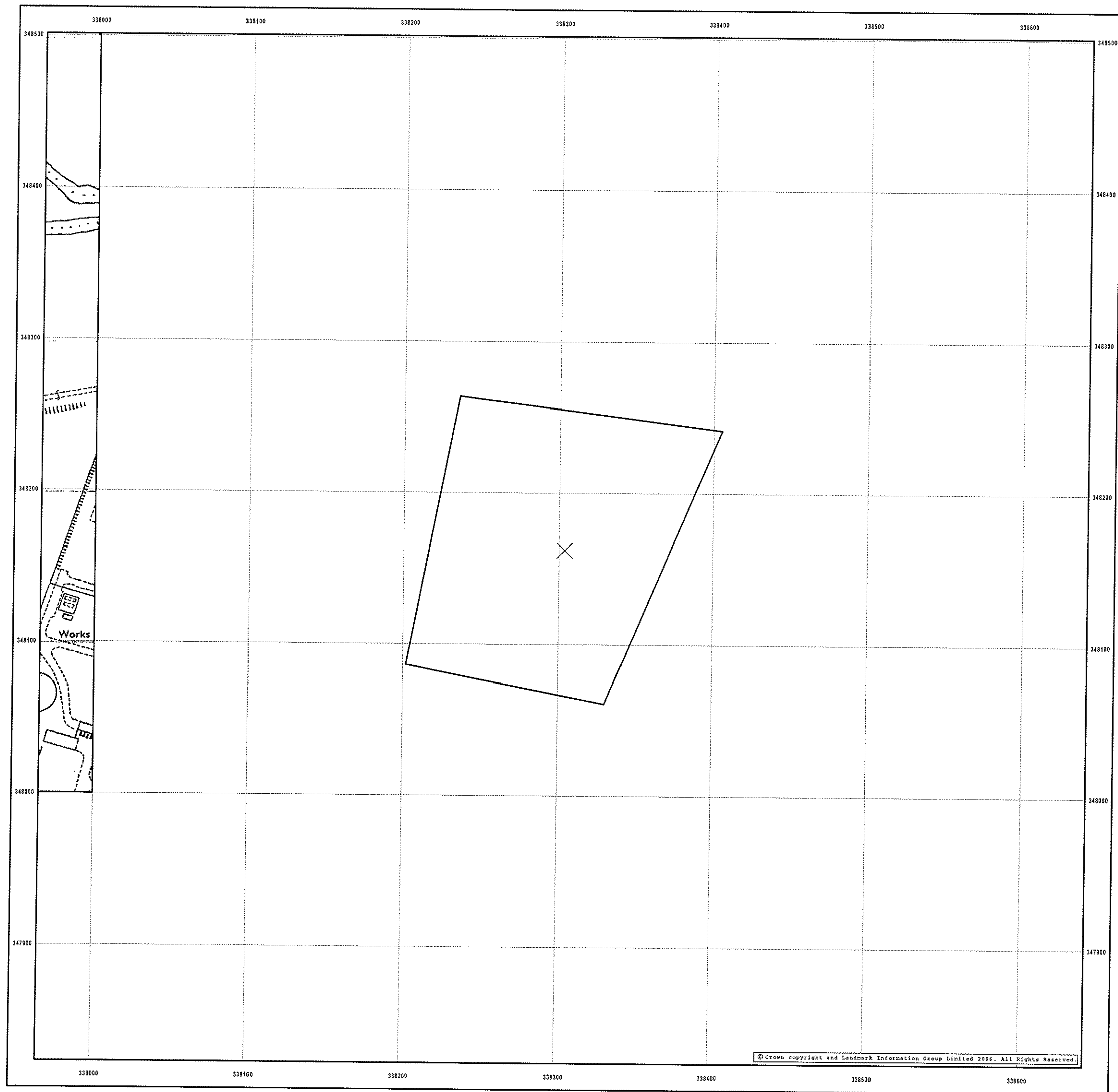
Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert	
Slope	Slope		
Pylon	Electricity Transmission Line	Direction of Water flow	Coppice, Osier
Marsh	Saltings	Orchard Tree	Reeds
Rough Grassland	Scrub	Heath	Bracken
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)	Non-coniferous Tree (Not Surveyed)

Additional SIMs 3
The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

ORDNANCE SURVEY PLAN
Published 1984
Source map scale - 1:2,500



Date(s) of Publication 7 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(10-Apr-2006 15:48)

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

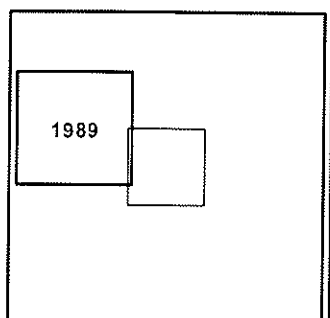
Historical Map Legend

Inactive Quarry, Chalk Pit or Clay Pit	Active Quarry, Chalk Pit or Clay Pit	Culvert	
Slope	Slope		
Pylon	Electricity Transmission Line	Direction of Water flow	Coppice, Osier
Marsh	Saltings	Orchard Tree	Reeds
Rough Grassland	Scrub	Heath	Bracken
Coniferous Tree (Surveyed)	Coniferous Tree (Not Surveyed)	Non-coniferous Tree (Surveyed)	Non-coniferous Tree (Not Surveyed)

Additional SIMs

The SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1991, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

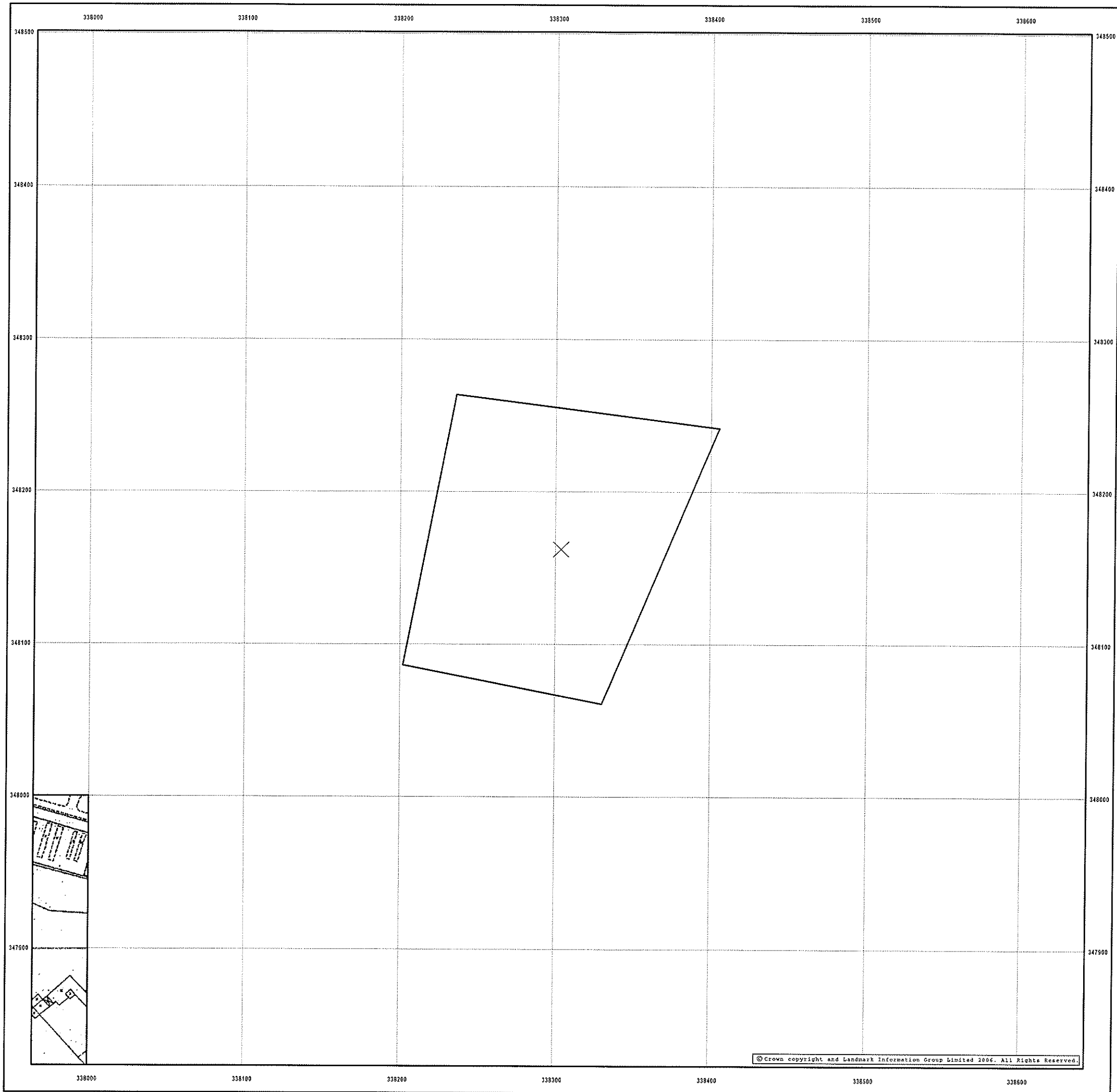
ORDNANCE SURVEY PLAN
Published 1989
Source map scale - 1:2,500



Date(s) of Publication 5 of 24



Produced by Landmark Information Group Limited, Tel: 0870 850 6670 Fax: 0870 850 6671

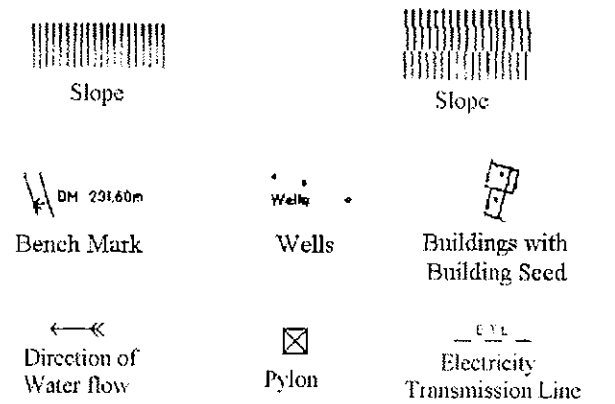


CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2008 15:47)
Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



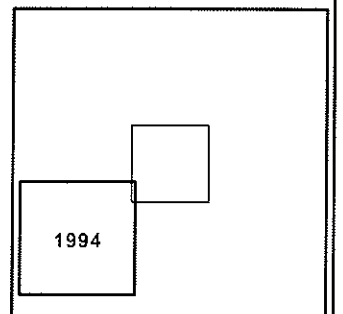
Administrative Boundaries

- • • • • Civil parish/community boundary
- — — District boundary
- * — County boundary
- Boundary post/stone
- Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

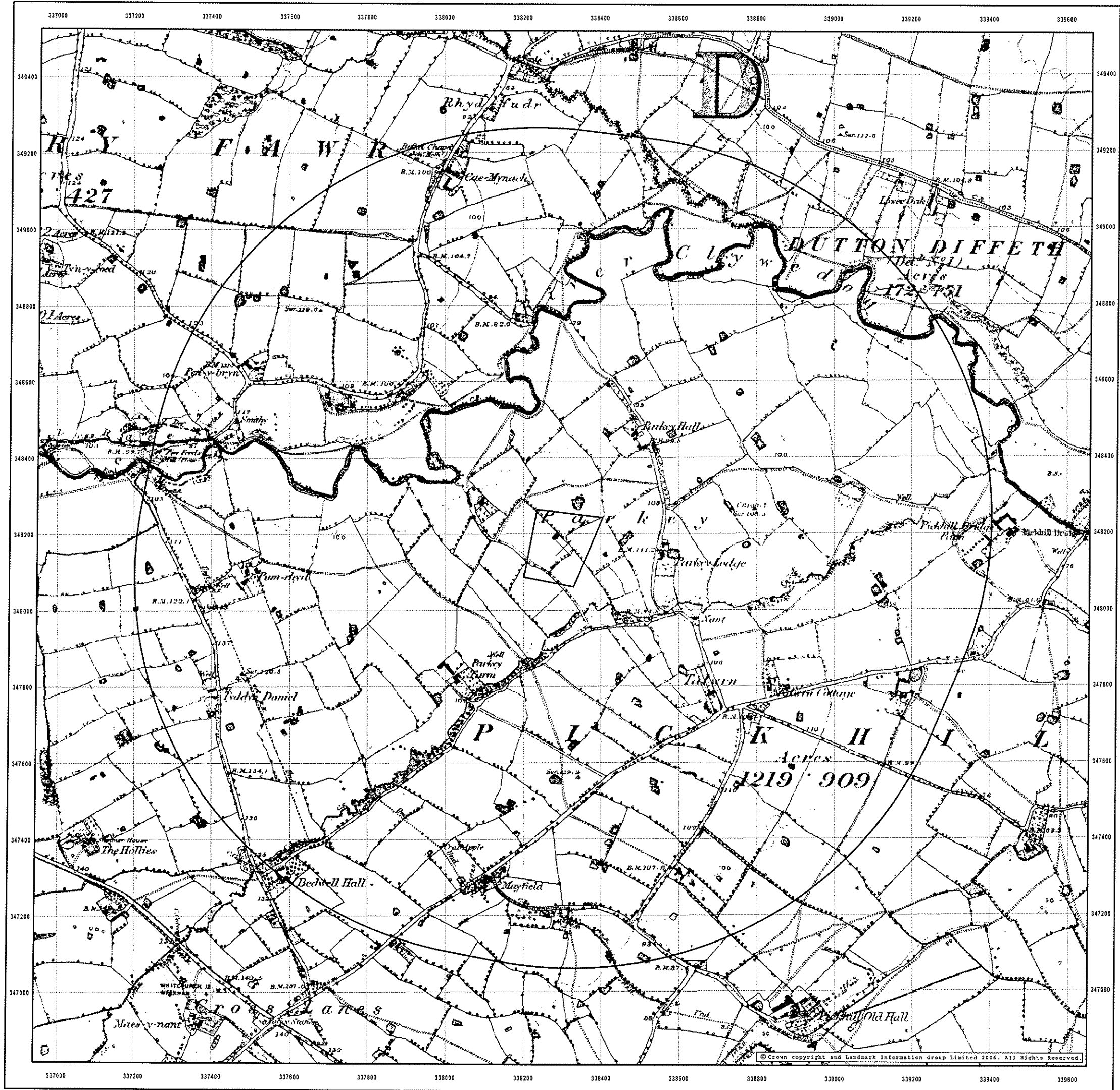
Large-Scale National Grid Data

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

ORDNANCE SURVEY PLAN
Published 1994
Source map scale - 1:2,500



Date(s) of Publication 10 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1

Customer Ref: c Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

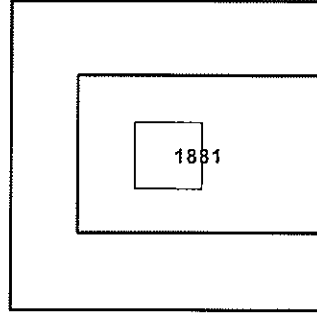
Arrow denotes flow of Water		Sketches Contour	

Ordnance Survey County Series

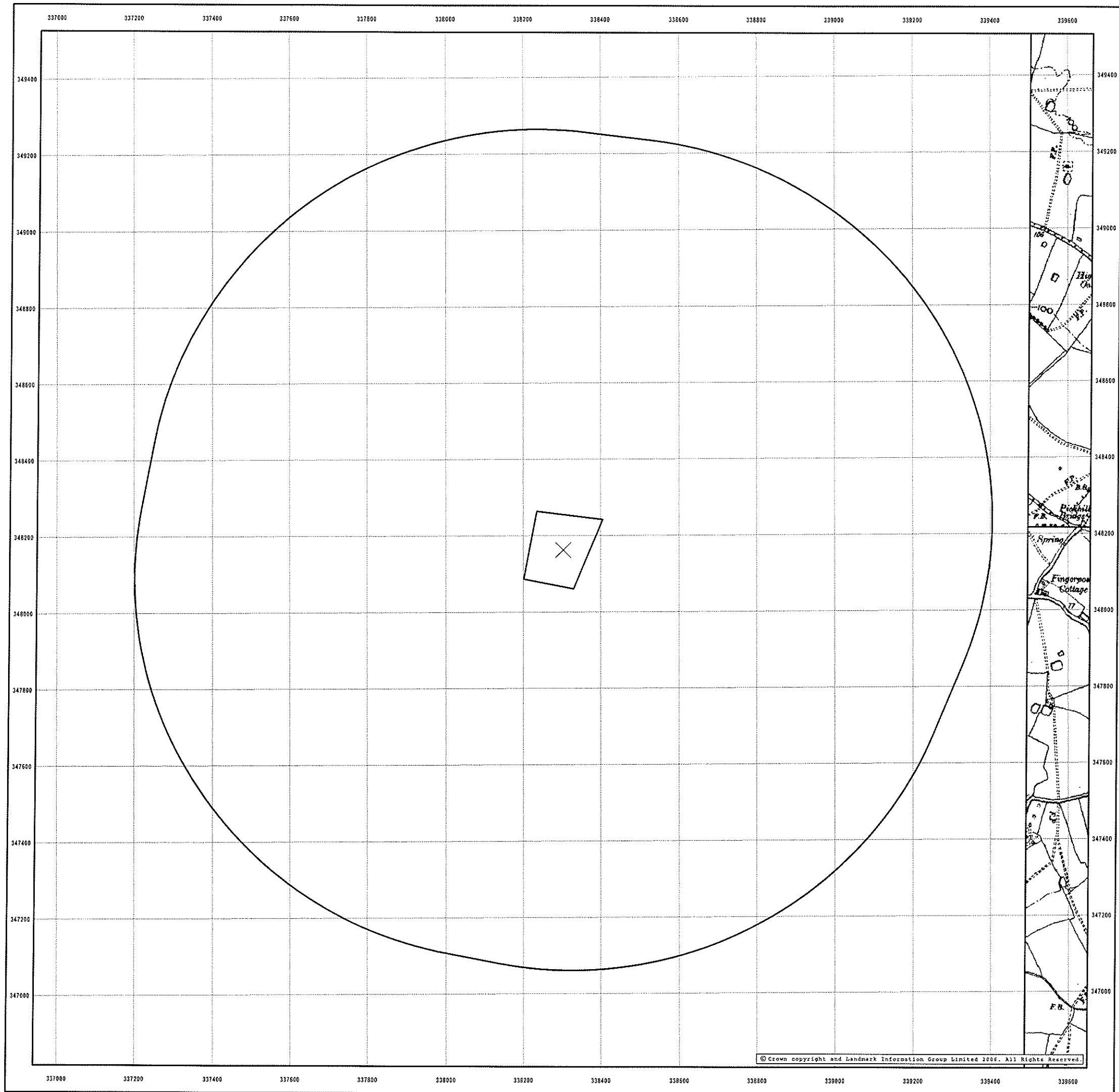
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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CHESHIRE
Published 1881
Source map scale - 1:10,560



Date(s) of Publication 11 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:47)

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	Sunken Road
Marsh	Reeds	Raised Road	Instrumental Contour
Osiers		Arrow denotes flow of Water	Sketched Contour

Ordnance Survey County Series 2

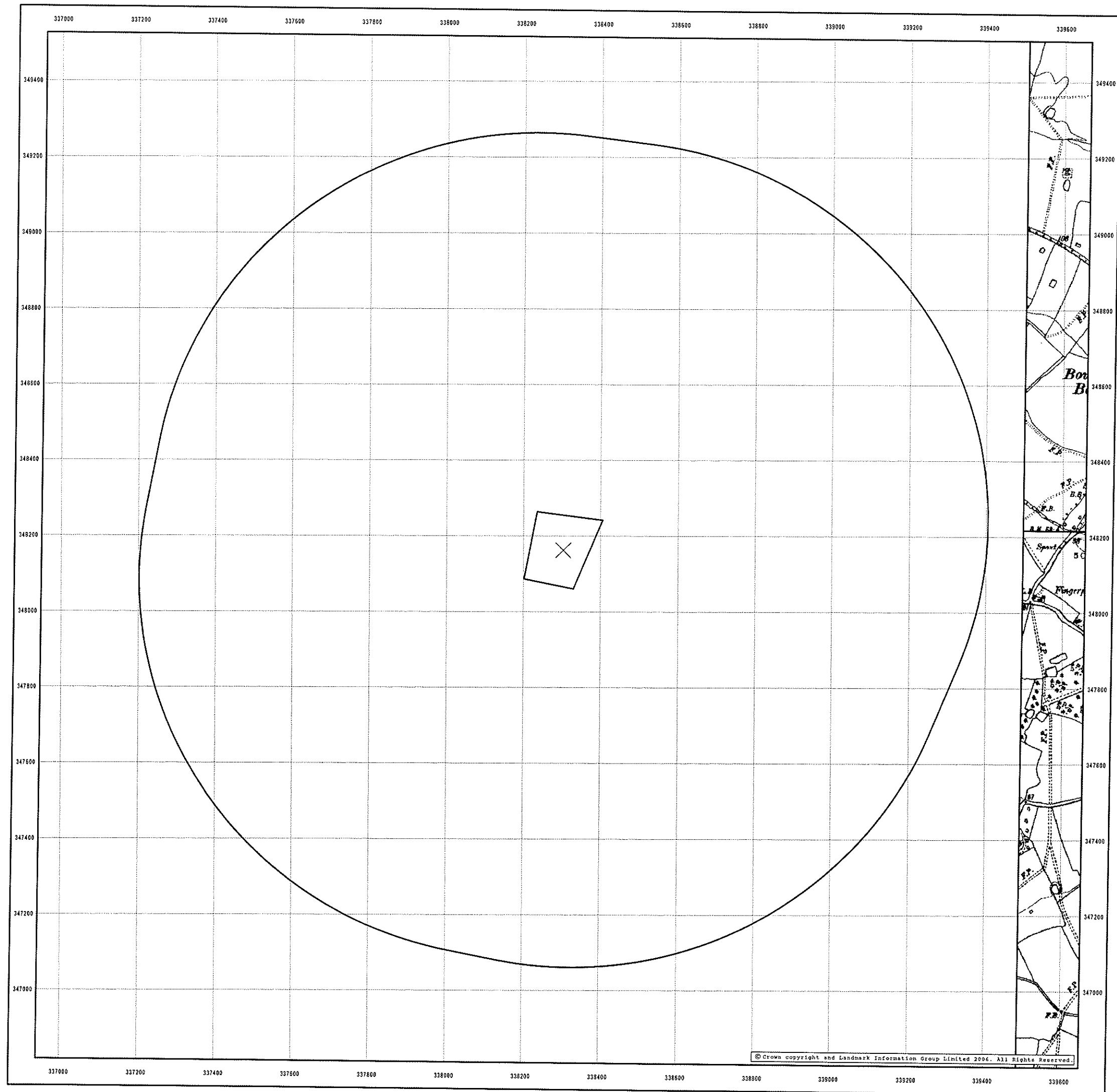
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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CHESHIRE
Published 1899 to 1900
Source map scale - 1:10,560

	1899
	1900

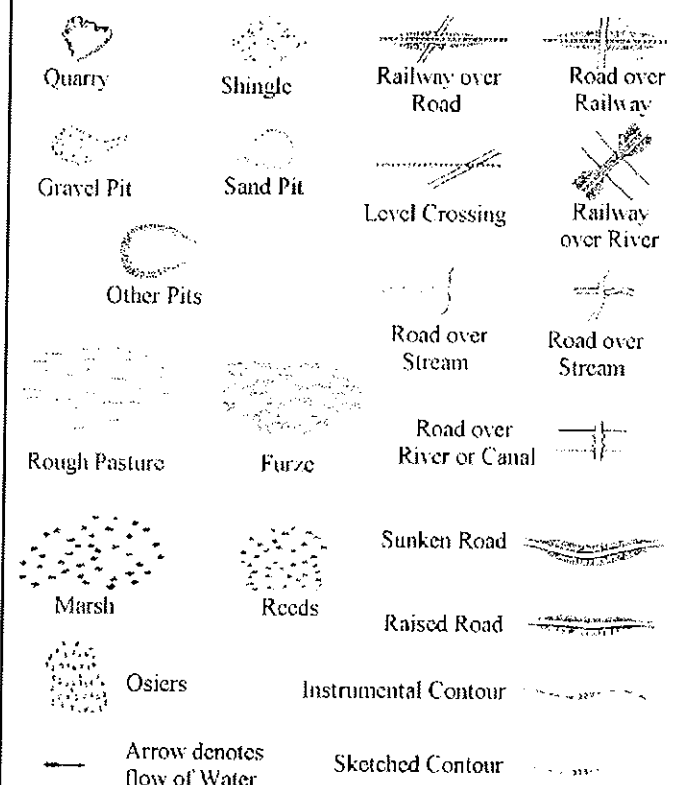
Date(s) of Publication 12 of 24



CLIENT DETAILS Envirocheck Order No. **EC19305141_1_1**
(10-Apr-2016 15:47)
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 Komex Clarke Bond
 3-8 Redcliffe Parade West
 Bristol
 BS1 6SP

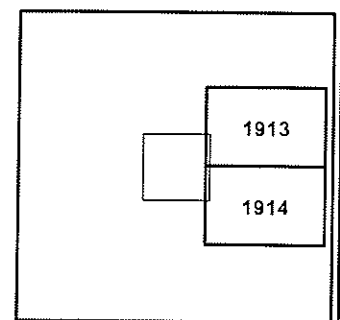
SITE DETAILS Grid Reference **338300 348160**
 3-8 Redcliffe Parade West
 Bristol
 Bristol City
 Bristol BS3 2BA

Historical Map Legend



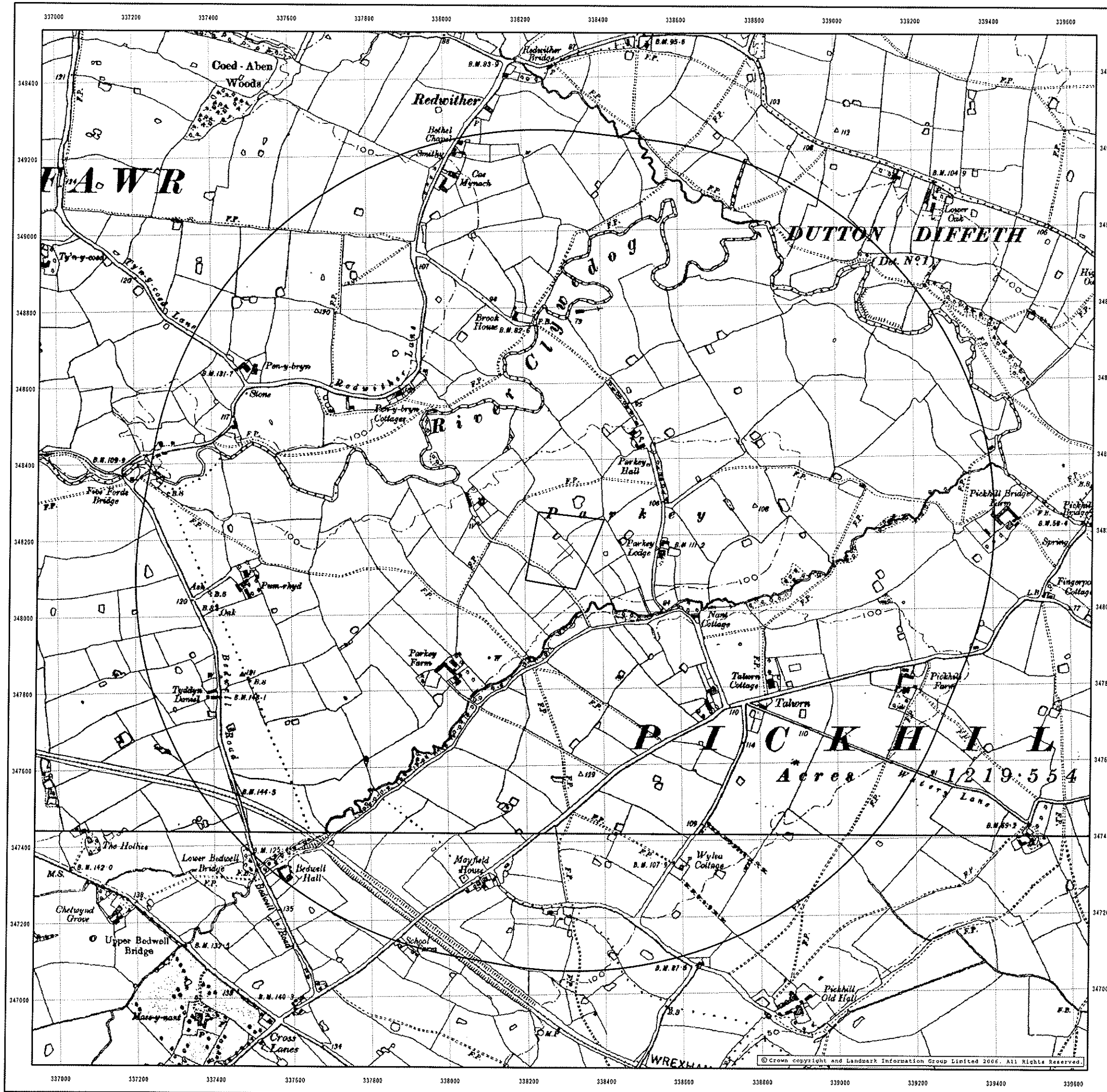
Ordnance Survey County Series 3
 The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.
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CHESHIRE
 Published 1913 to 1914
 Source map scale - 1:10,560



Date(s) of Publication 13 of 24





CLIENT DETAILS

Envirocheck Order No. EC19305141_1_1

Customer Ref: C Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

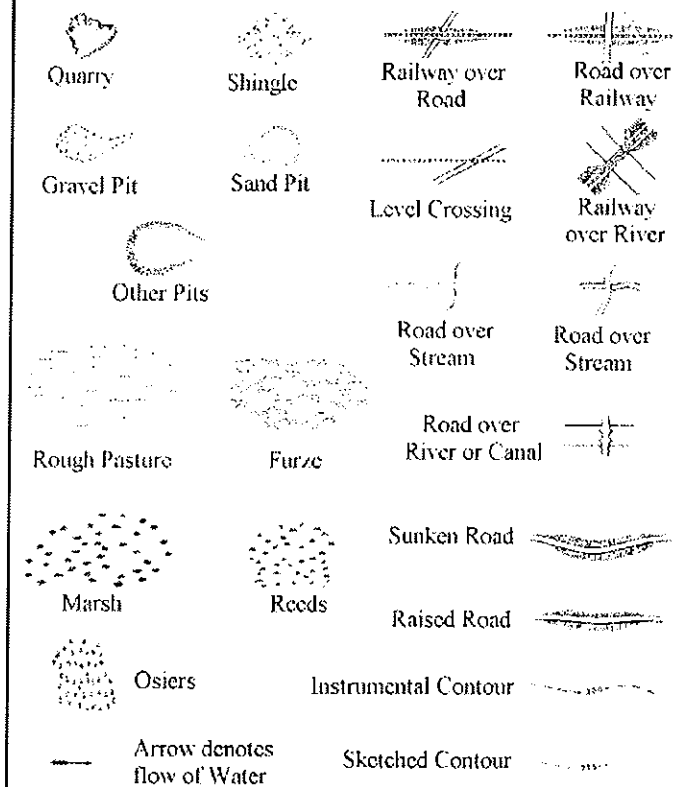
SITE DETAILS

Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

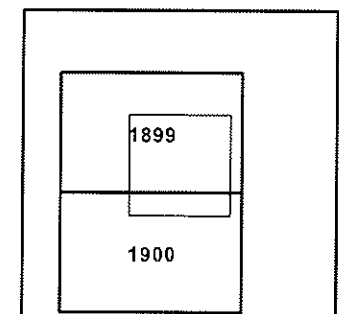
**Ordnance Survey County Series**

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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DENBIGHSHIRE

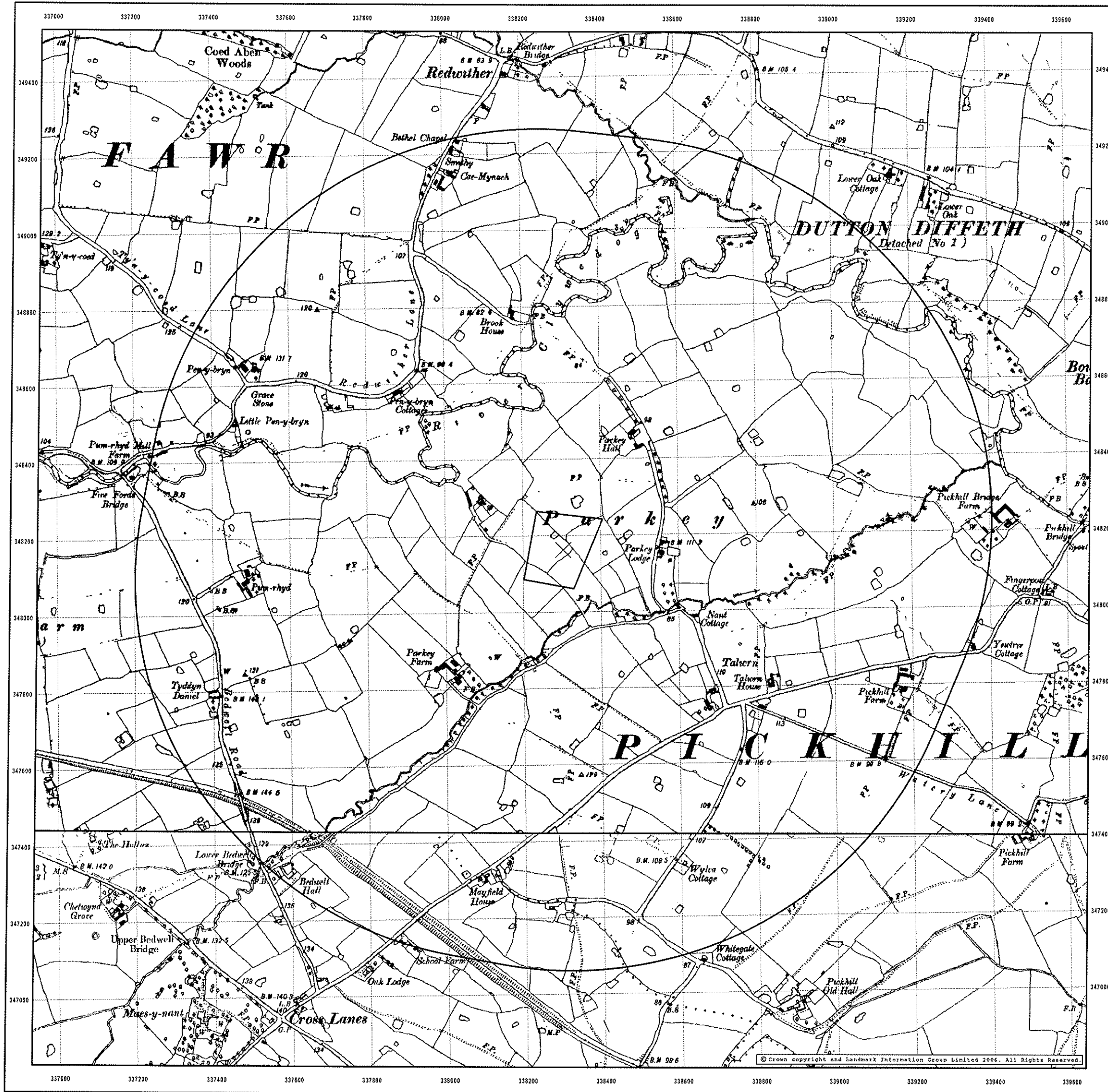
Published 1899 to 1900
Source map scale - 1:10,560



Date(s) of Publication 15 of 24



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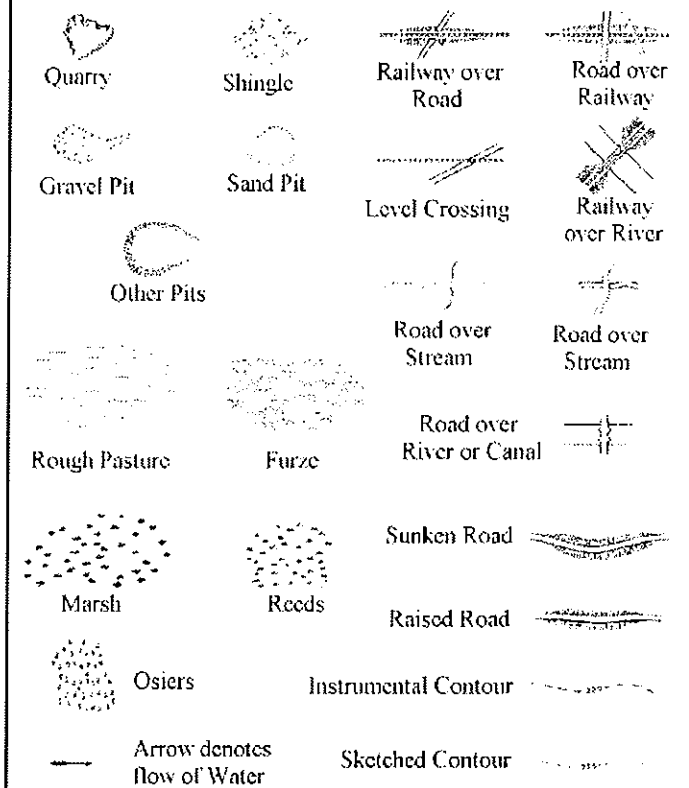
CLIENT DETAILS Envirocheck Order No. EC19305141_1_1

Customer Ref: C Coldrey, 50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

Historical Map Legend



Ordnance Survey County Series

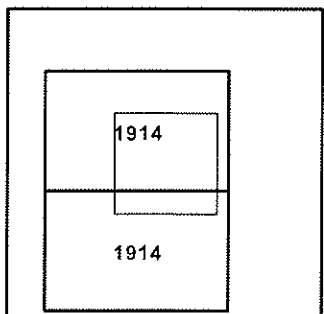
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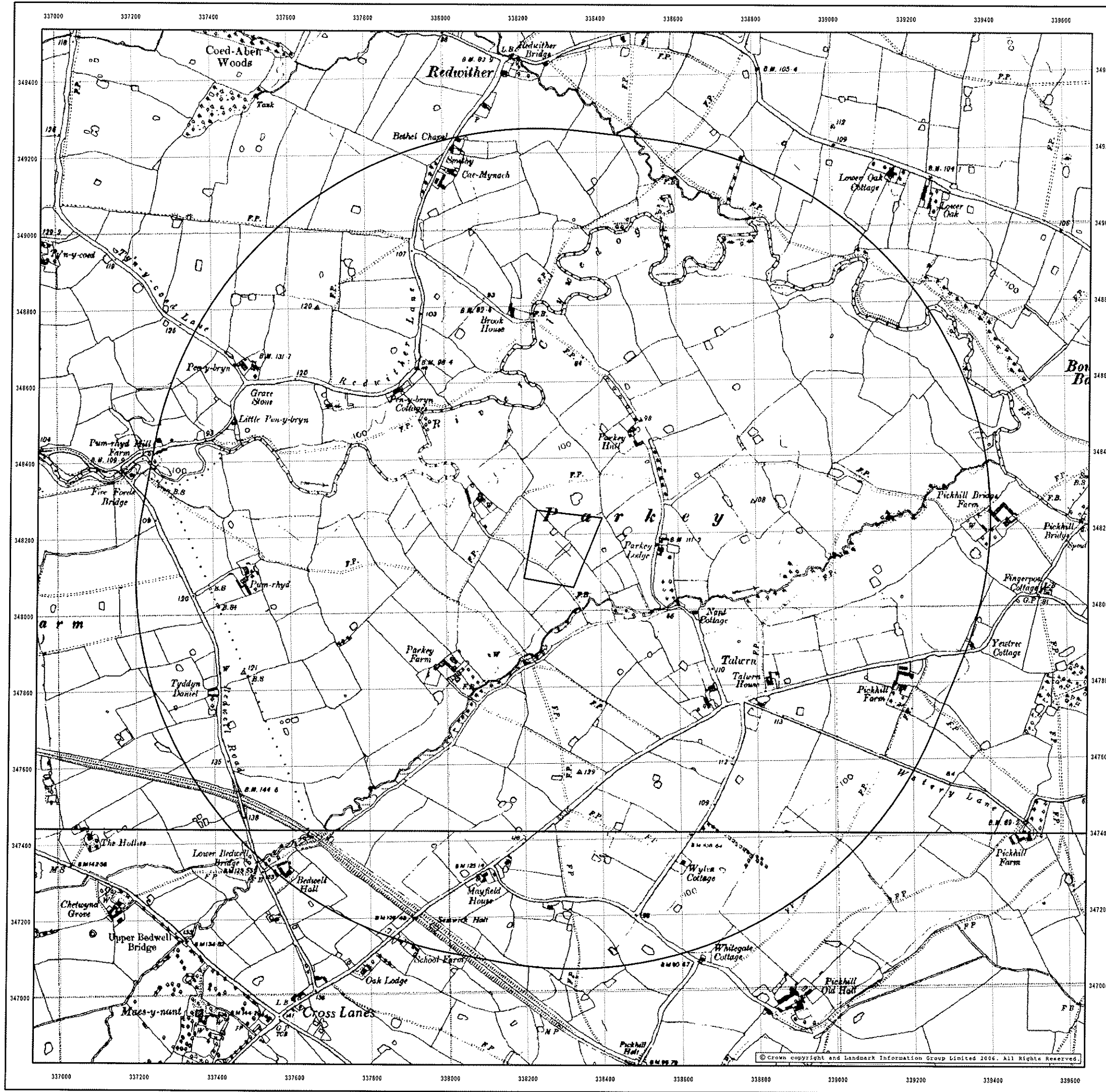
DENBIGHSHIRE

Published 1914

Source map scale - 1:10,560



Date(s) of Publication 15 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(20-Apr-2006 15:43)

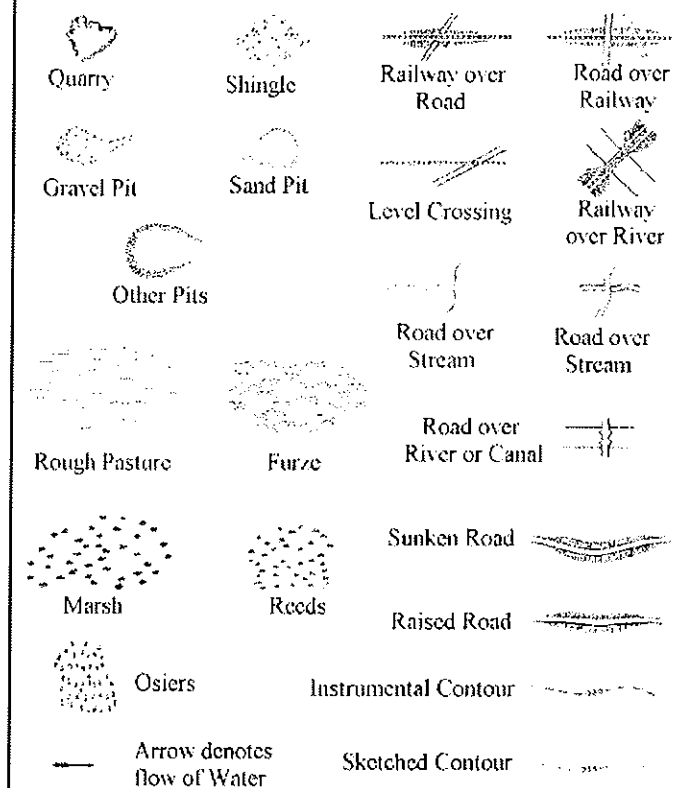
Customer Ref: c Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend

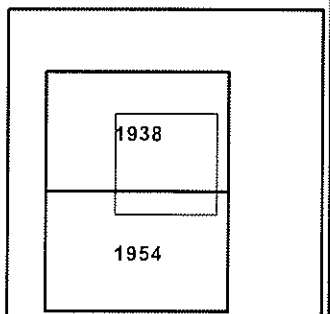


Ordnance Survey County Series

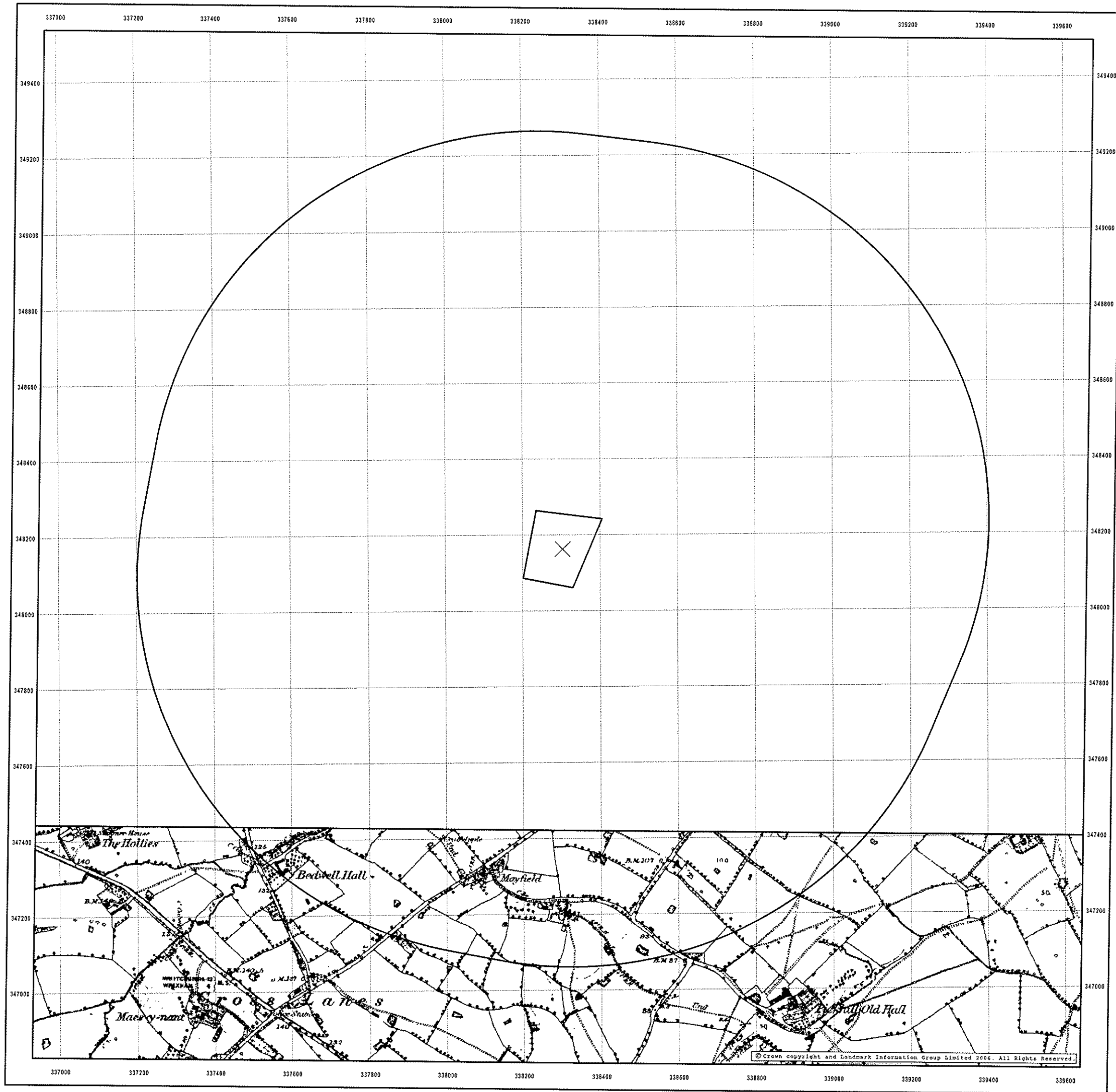
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DENBIGHSHIRE
Published 1938 to 1954
Source map scale - 1:10,560



Date(s) of Publication 17 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
(28-Apr-2006 15:43)
 Customer Ref: C Coldrey_50065-25
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 3-8 Redcliffe Parade West
 Bristol
 BS1 6SP

SITE DETAILS Grid Reference 338300 348160
 3-8 Redcliffe Parade West
 Bristol
 Bristol City
 Bristol BS3 2BA

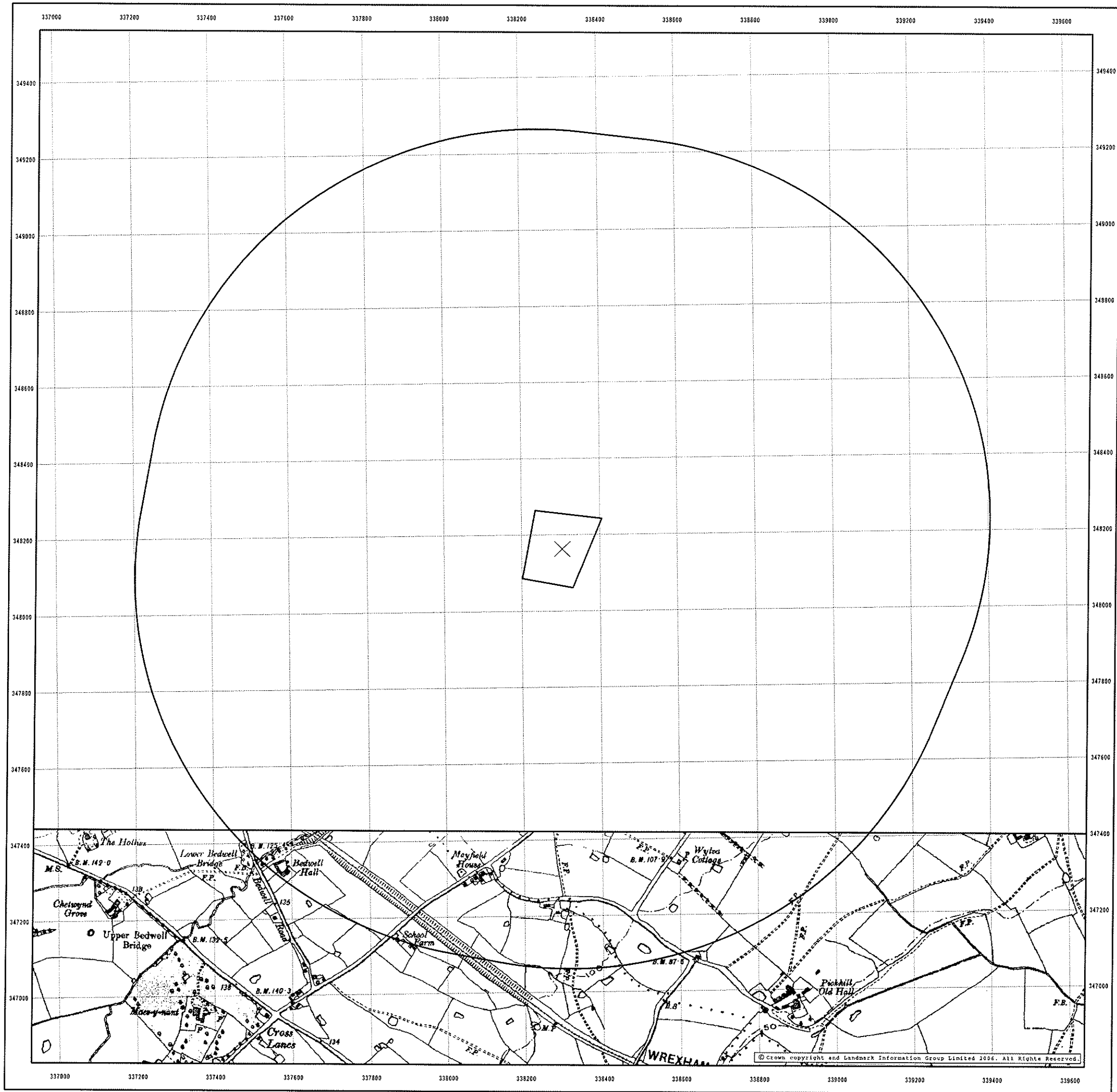
Historical Map Legend			
Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over Stream	Road over Stream
Rough Pasture	Furze	Road over River or Canal	
Marsh	Reeds	Sunken Road	
Osiers		Raised Road	
		Instrumental Contour	
Arrow denotes flow of Water		Sketched Contour	

Ordnance Survey County Series 1
 The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.
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FLINTSHIRE
 Published 1881
 Source map scale - 1:10,560

Date(s) of Publication 18 of 24





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(20-May-2020 12:43)
 Customer Ref: C Coldrey,50065-25
 Komex Clarke Bond
 3-8 Redcliffe Parade West
 Bristol
 BS1 6SP

SITE DETAILS Grid Reference **338300 348160**
 3-8 Redcliffe Parade West
 Bristol
 Bristol City
 Bristol BS3 2BA

Historical Map Legend			
	Quarry		Shingle
	Gravel Pit		Sand Pit
	Other Pits		Level Crossing
	Rough Pasture		Road over Stream
	Marsh		Road over River or Canal
	Osiers		Sunken Road
	Instrumental Contour		Raised Road
	Arrow denotes flow of Water		Sketched Contour

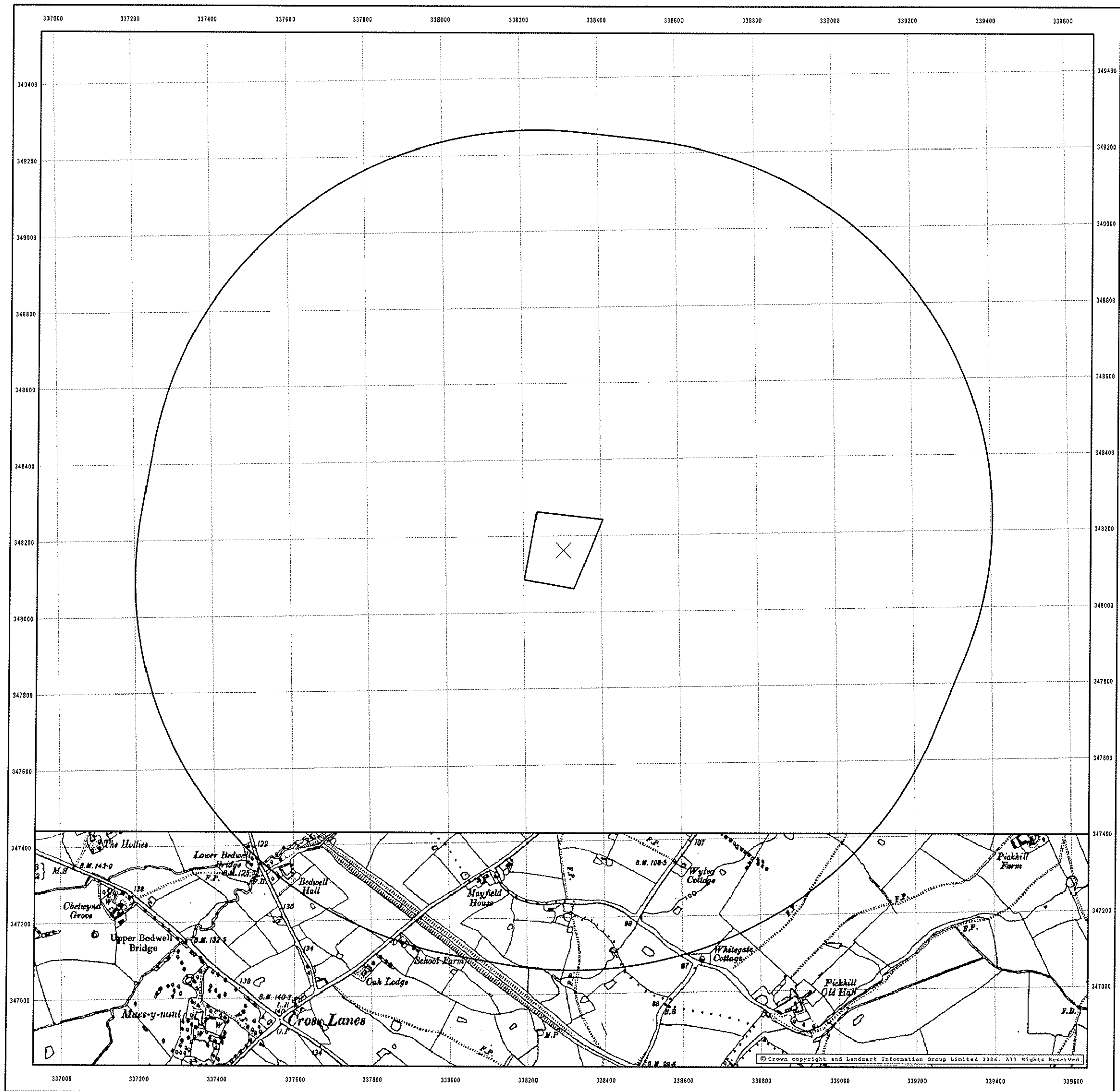
Ordnance Survey County Series 2
 The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.
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FLINTSHIRE
 Published 1900
 Source map scale - 1:10,560

Date(s) of Publication 19 of 24



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(29-Apr-2006 15:43)

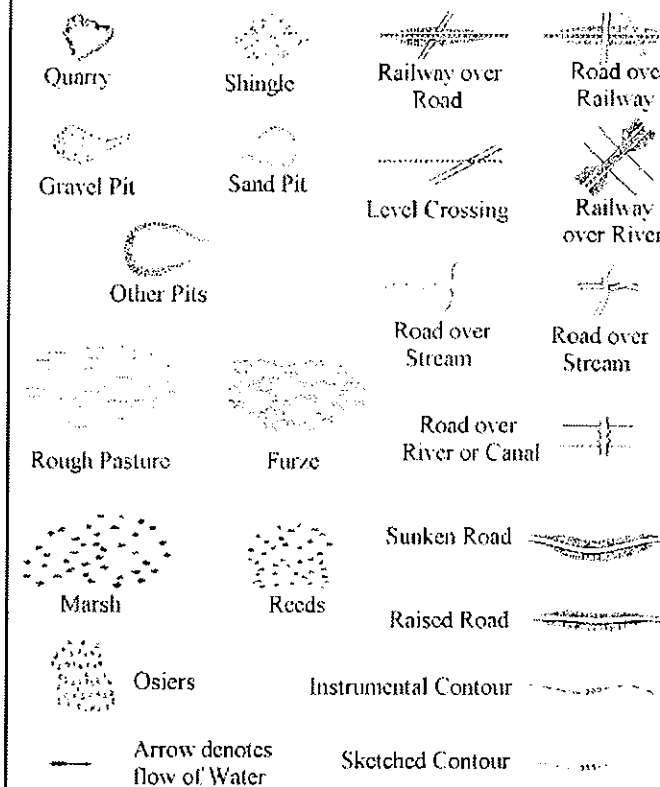
Customer Ref: c Coldrey,50065-25
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference **338300 348160**

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend



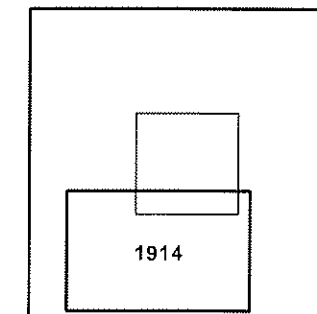
Ordnance Survey County Series

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FLINTSHIRE
Published 1914

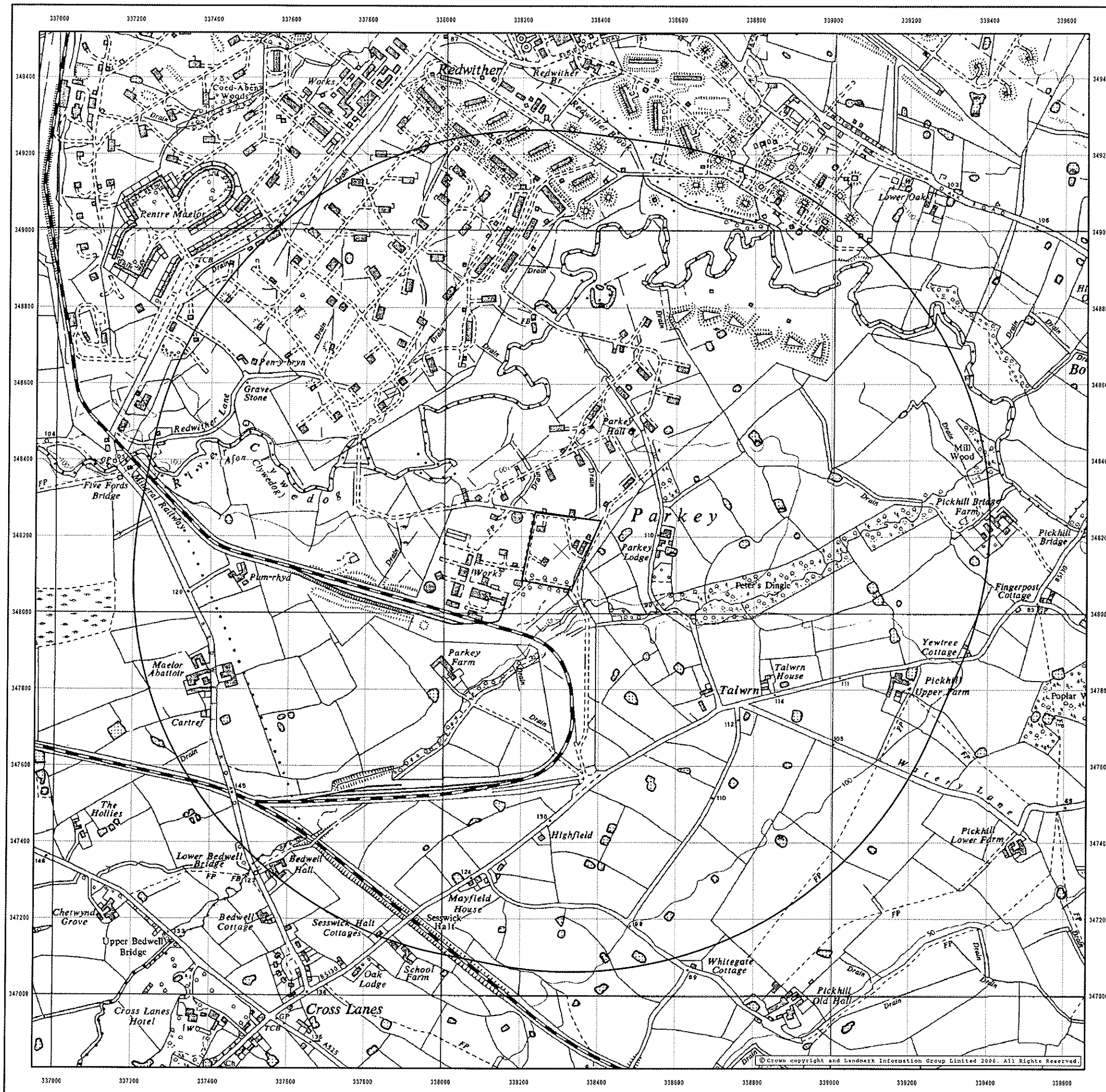
Source map scale - 1:10,560



Date(s) of Publication 20 of 24



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Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA

Historical Map Legend			
	Chalk Pit, Clay Pit, or Quarry		Non-coniferous Trees
	Gravel Pit		Coniferous Trees
	Sand Pit		Scrub
	Disused Pit or Quarry		Lake, Loch or Pond
	Refuse or Slag Heap		Pylen
	Direction of Flow of Water		Electricity
	Cutting		Pole
	Embankment		Transmission Line
	Road Under		Marsh
	Road Over		Shingle
	Level Crossing		Sand
	Foot Bridge		Standard Gauge
	Siding, Tramway or Mineral Line		Multiple Track
	Narrow Gauge		Single Track

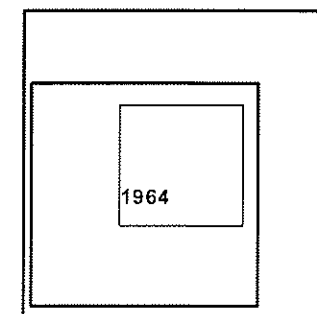
Ordnance Survey Plan

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

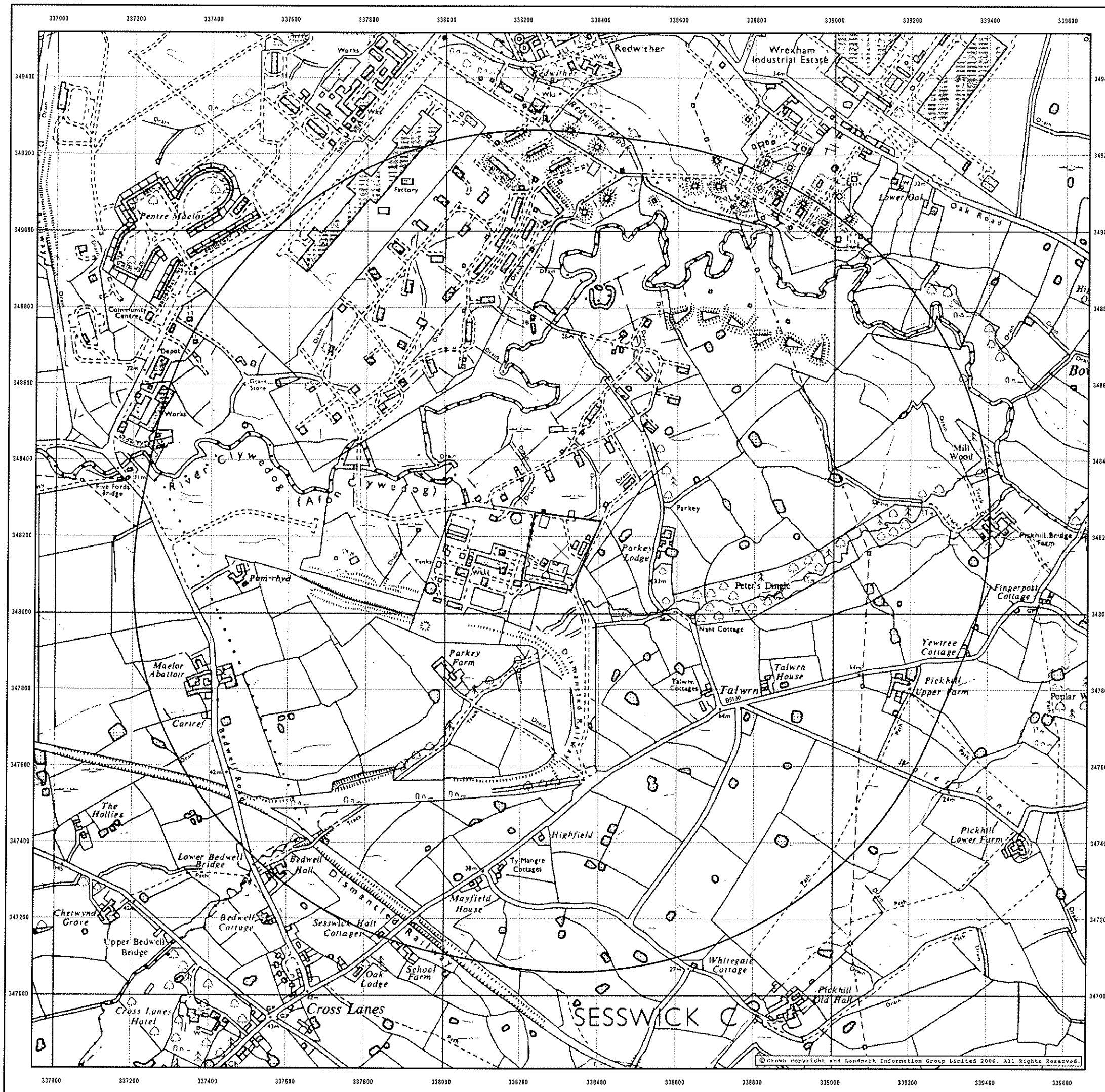
In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

ORDNANCE SURVEY PLAN
Published 1964

Source map scale - 1:10,560



Date(s) of Publication 21 of 24



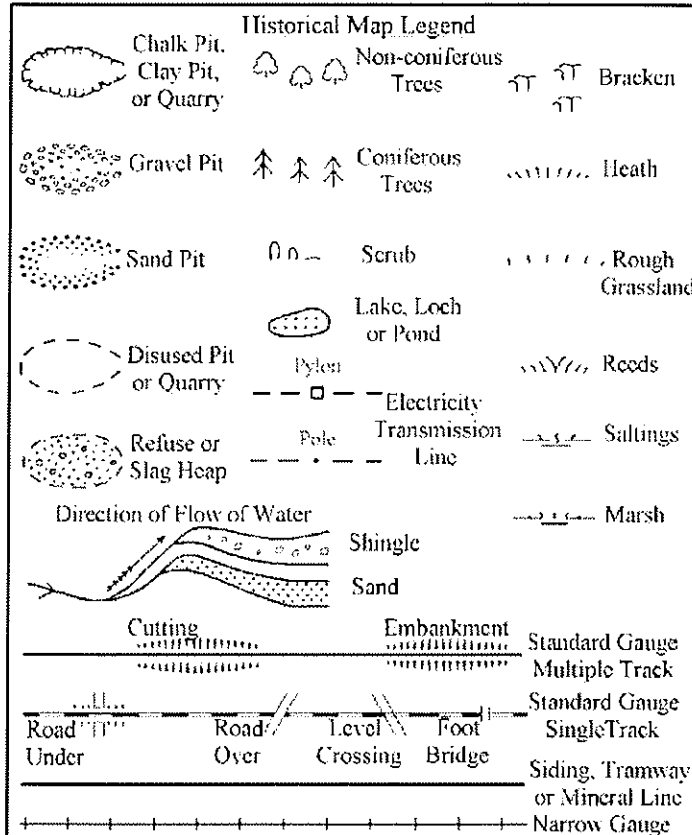
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Customer Ref: C Coldrey, 50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA



Ordnance Survey Plan

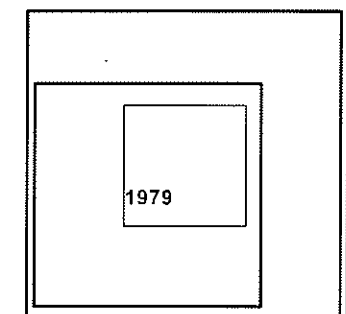
The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given on the right therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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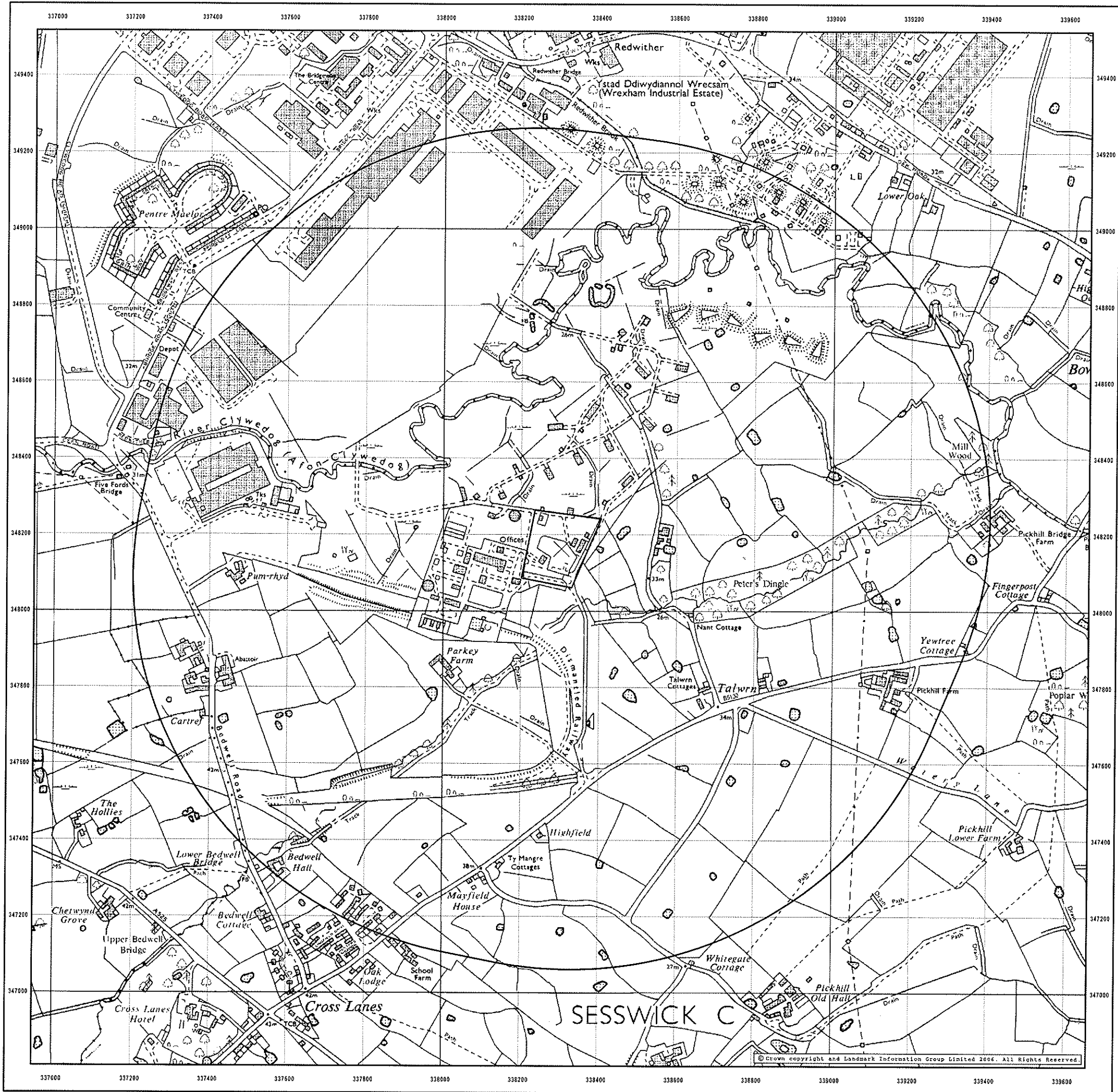
ORDNANCE SURVEY PLAN

Published 1979

Source map scale - 1:10,000



Date(s) of Publication 22 of 24



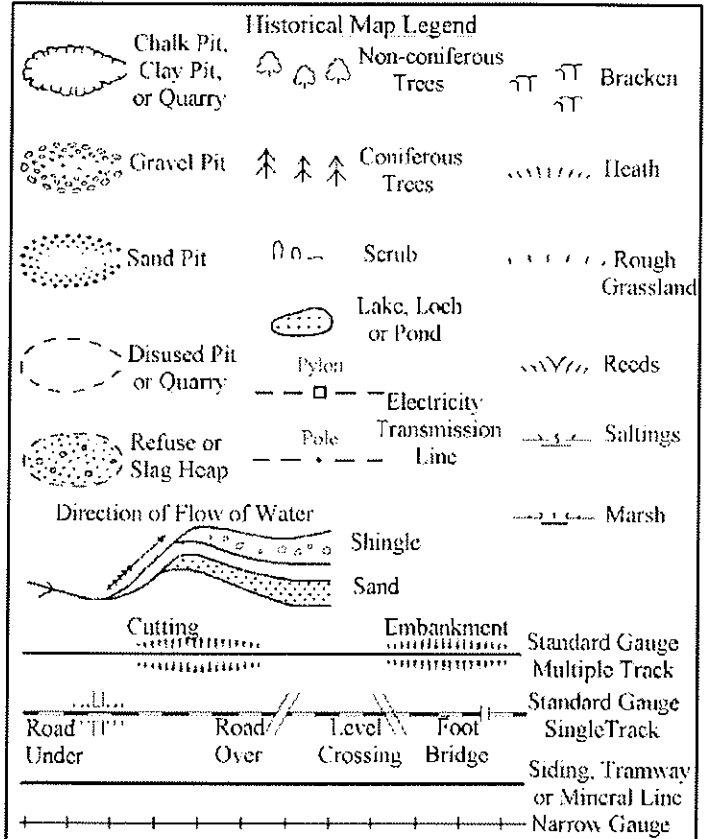
CLIENT DETAILS Envirocheck Order No. **EC19305141_1_1**
(10-Apr-2006 15:55)

Customer Ref: **c Coldrey,50065-25**
Komex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference **338300 348160**

3-8 Redcliffe Parade West
Bristol

Bristol City
Bristol BS3 2BA



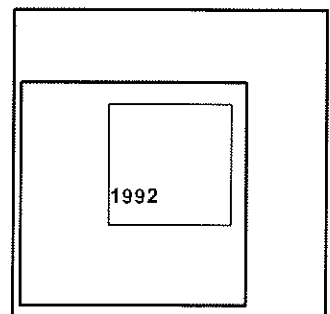
Ordnance Survey Plan

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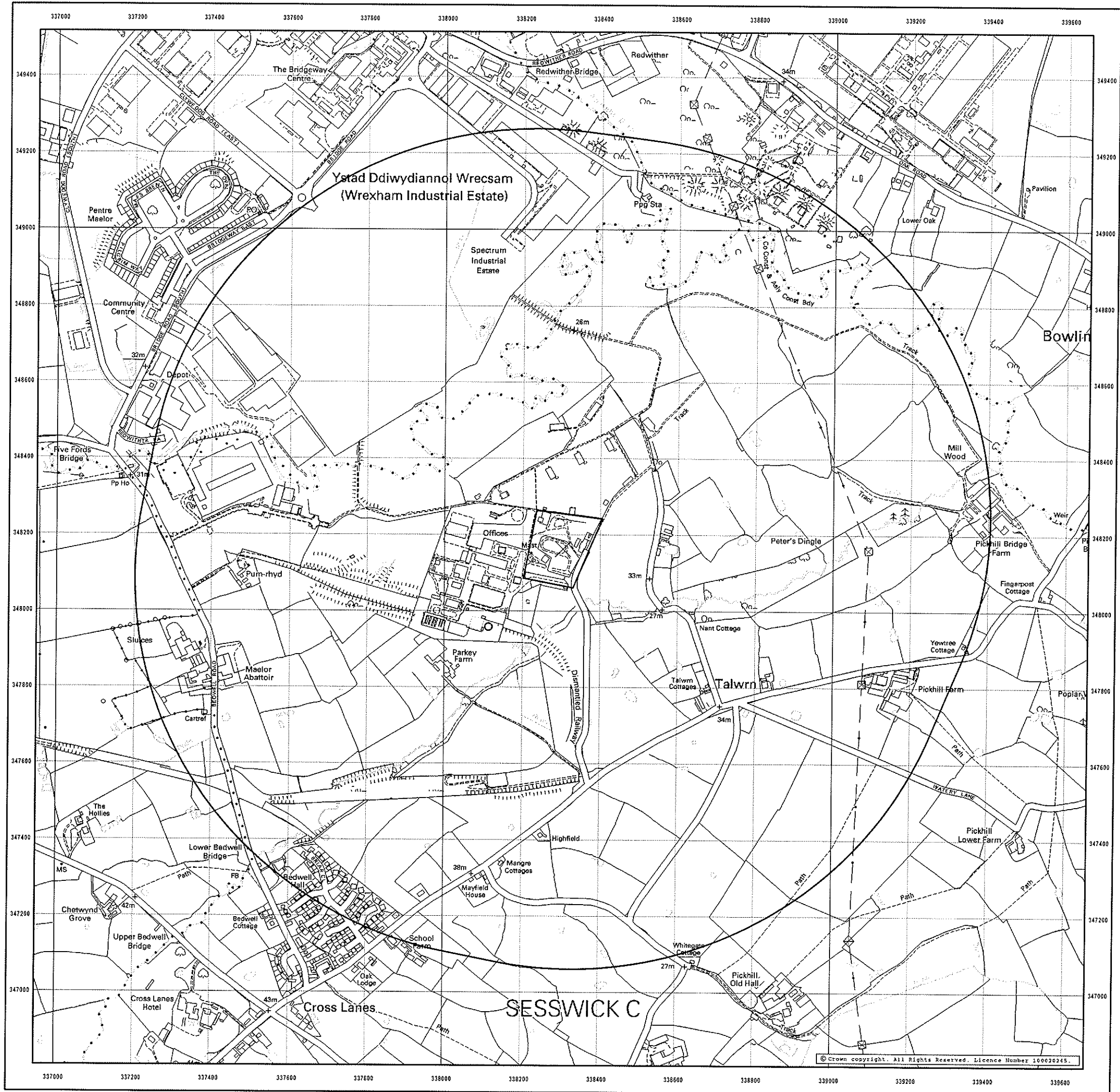
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ORDNANCE SURVEY PLAN
Published 1992

Source map scale - 1:10,000



Date(s) of Publication 23 of 24



CLIENT DETAILS Envirocheck Order No. EC19305141_1_1
Customer Ref: C Coldrey,50065-25
Kornex Clarke Bond
3-8 Redcliffe Parade West
Bristol
BS1 6SP

SITE DETAILS Grid Reference 338300 348160
3-8 Redcliffe Parade West
Bristol
Bristol City
Bristol BS3 2BA

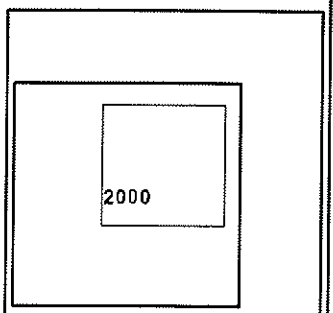
Historical Map Legend

	Non-coniferous Trees		Pylon
	Coniferous Trees		Telephone Line (where shown)
	Orchard		Electricity Transmission Line (with poles)
	Rough Grassland		Gravel Pit
	Heath		Shingle
	Scrub		Refuse Tip or Slag Heap
	Marsh, Salt Marsh or Reeds		Sand
	County Boundary (England only)		Sand Pit
	Civil Parish or Community Boundary		Slopes
	Constituency Boundary		District, Unitary, Metropolitan, London Borough Boundary

10K Raster Mapping

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan® which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

ORDNANCE SURVEY PLAN
Published 2000
Source map scale - 1:10,000



Date(s) of Publication 24 of 24



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"Services" means the provision of any service by Landmark pursuant to these Terms, including without limitation, any Report.

"Landmark Fees" means any charges levied by Landmark for Services provided to You.

"Suppliers" means any organisation who provides data or information of any form to Landmark.

"Terms" means these Terms & Conditions.

"Third Party Content" means the services, software, information and other content or functionality provided by third parties and linked to or contained in the Services.

"Websites" means websites hosted by Landmark and includes the Content and any report, service, document, data-set, software or information contained therein, derived there from or thereby.

1. Terms & Conditions

- These Terms govern the relationship between You and Landmark whether You are an unregistered visitor to the Website or are purchasing Services. Where these Terms are not expressly accepted by You they will be deemed to have been accepted by You, and You agree to be bound by these Terms when You place any Order, or pay for any Services provided
- If the person communicating with Landmark is an Authorised Reseller, they must ensure that You agree to these Terms.
- The headings in these Terms are for convenience only and shall not affect the meaning or interpretation of any part of these Terms.
- Landmark may modify these Terms, and may discontinue or revise any or all other aspects of the Services at our sole discretion, with immediate effect and without prior notice, including without limitation changing the Services available at any given time. Any amendment or variation to these Terms shall be posted on our Websites. Continued use of the Services by You shall be deemed an acceptance by You to be bound by any such amendments to the Terms.
- These Terms, together with the prices and delivery details set out on our Websites, Landmark's Privacy Policy and Your Order comprise the whole agreement relating to the supply of Services to You by Landmark. No prior stipulation, agreement, promotional material or statement whether written or oral made by any sales or other person or representative on our behalf should be understood as a variation of these Terms. Save for fraud or misrepresentation, Landmark shall have no liability for any such representation being untrue or misleading.
- These Terms shall prevail at all times to the exclusion of all other terms and conditions including any terms and conditions which You may purport to apply even if such other provisions are submitted in a later document or purport to exclude or override these Terms and neither the course of conduct between parties nor trade practice shall act to modify these Terms.

2. Services

- Landmark will use reasonable care and skill in providing the Services to You, however, the Services are provided on the express basis that the information and data supplied in the Services are derived from third party sources and Landmark does not warrant the accuracy or completeness of such information or data. Such information is derived solely from those sources specifically cited in the Services and Landmark does not

claim that these sources represent an exhaustive or comprehensive list of all sources that might be consulted.

3. Intellectual Property

- You acknowledge that all Intellectual Property Rights in the Services are and shall remain owned by either Landmark or our Suppliers and nothing in these Terms purports to transfer, assign or grant any rights to You in respect of the Intellectual Property Rights.
- Subject always to these Terms You may, without further charge, make the Services available to;
 - the owner of the Property at the date of the Report,
 - any person who purchases the whole of the Property Site,
 - any person who provides funding secured on the whole of the Property Site,
 - any person for whom You act in a professional or commercial capacity,
 - any person who acts for You in a professional or commercial capacity; and
 - prospective buyers of the Property Site as part of an Information Pack but for the avoidance of doubt, Landmark shall have no liability to such prospective buyer unless the prospective buyer subsequently purchases the Property Site, and the prospective (or actual) buyer shall not be entitled to make the Service available to any other third party.Accordingly Landmark shall have the same duties and obligations to those persons in respect of the Services as it has to You.

- Each of those persons referred to in clause 3.b. shall have the benefit and the burden of Your rights and obligations under these Terms. The limitations of Landmark's liability as set out in clause 6 shall apply to all users of the Service in question in aggregate and Landmark shall not be liable to any other person.

- All parties given access to the Services agree that they will treat as strictly private and confidential the Services and all information which they obtain from the Services and shall restrict any disclosure to employees or professional advisors to enable the relevant party to conduct its internal business. The requirement in this clause to treat the Services as confidential shall include a requirement to maintain adequate security measures to safeguard the Services from unauthorised access, use or copying.

- Each recipient of the Services agrees (and agrees it will cause its employees, agents or contractors who may from time to time have access to the Services to agree) it will not, except as permitted herein or by separate agreement with Landmark:-

- effect or attempt to effect any modification, merger or change to the Service, nor permit any other person to do so; or
 - copy, use, market, re-sell, distribute, merge, alter, add to or carry on any redistribution, reproduction, translation, publication, reduction to any electronic medium or machine readable form or commercially exploit or in any other way deal with or utilise or (except as expressly permitted by applicable law) reverse engineer, decompile or disassemble the Services, Content or Website; or
 - remove, alter or in any way change any trademark or proprietary marking in any element of the Services and You shall acknowledge the ownership of the Content, where such Content is incorporated or used into Your own documents, reports, systems or services whether or not these are supplied to any third party,
 - create any product which is derived directly or indirectly from the data contained in the Services
- The mapping contained in any Services is protected by Crown Copyright and must not be used for any purpose outside the context of the Services or as specifically provided by these Terms.
 - You are permitted to make five copies of any Report, but are not authorised to re-sell the Report, any part thereof or any copy thereof unless you are an Authorised Reseller. Further copies may not be made in whole or in part without the prior written permission of Landmark who shall be entitled to make a charge for each additional copy.

4. Charges

- VAT at the prevailing rate shall be payable in addition to the Landmark Fees. You shall pay any other applicable indirect taxes related to Your use of the Services.
- An individual or a monthly invoice showing all Orders created by You will be generated subject to these Terms. You will pay the Landmark Fees at the rates set out in Landmark's or its Authorised Reseller's invoice. The Landmark Fees are payable in full within 30 days without deduction, counterclaim or set off. You acknowledge that time is of the essence with respect to the payment of such invoices. Landmark reserve the right to amend the Landmark Fees from time to time and the Services will be charged at the Landmark Fee applicable at the date on which the Service is ordered.
- We may charge interest on late payment at a rate equal to 3% per annum above the base lending rate of National Westminster Bank plc.
- Landmark or its Authorised Reseller shall not be obliged to invoice any party other than You for the provision of Services, but where Landmark or its Authorised Reseller does so invoice any third party at Your request, and such invoice is not accepted or remains unpaid, Landmark or its Authorised Reseller shall have the option at any time to cancel such invoice and invoice You direct for such Services. Where Your order comprises a number of

Services or severable elements within any one or more Services, any failure by Landmark or its Authorised Reseller to provide an element or elements of the Services shall not prejudice Landmark's or its Authorised Reseller's ability to require payment in respect of the Services delivered to You.

5. Termination

- Landmark may suspend or terminate Your rights under these Terms without any liability to You with immediate effect if at any time:-
 - You fail to make any payment due in accordance with clause 4;
 - You repeatedly breach or commit or cause to be committed any material breach of these Terms; or
 - You commit a breach and You fail to remedy the breach within 7 days of receipt of a written notice to do so; additionally, without prejudice to the foregoing, Landmark may remedy the breach and recover the costs thereof from You.
- If Your rights are terminated under this clause and You have made an advance payment We will refund You a reasonable proportion of the balance as determined by Us in relation to the value of Services previously purchased.
- Landmark reserves the right to refuse to supply any or all Services to You without notice or reason.

6. Liability

- We provide warranties and accept liability only to the extent stated in this clause 6 and clause 7.
- Nothing in these Terms excludes either party's liability for death or personal injury caused by that party's negligence or wilful default, and the remainder of this clause 6 is subject to this provision and Your statutory rights.
- As most of the information contained in the Services is provided to Landmark by others, Landmark cannot control its accuracy or completeness, nor is it within the scope of Landmark's Services to check the information on the ground. Accordingly, Landmark will only be liable to You for any loss or damage caused by its negligence or wilful default and subject to clause 6.o below neither Landmark nor any person providing information contained in any Services shall in any circumstances be liable for any inaccuracies, faults or omissions in the Services, nor shall Landmark have any liability if the Services are used otherwise than in accordance with these Terms.
- Save as precluded by law, Landmark shall not be liable for any indirect or consequential loss, damage or expenses (including loss of profits, loss of contracts, business or goodwill) howsoever arising out of any problem, event, action or default by Landmark.
- In any event, and notwithstanding anything contained in these Terms, Landmark's liability in contract, tort (including negligence or breach of statutory duty) or otherwise howsoever arising by reason or in connection with this Contract (except in relation to death or personal injury) shall be limited to an aggregate amount not exceeding £1 million if the complaint is in relation to a Report on residential property and an aggregate amount not exceeding £10 million in respect of any other Report or Service purchased from Landmark.
- Landmark will not be liable for any defect, failure or omission relating to Services that is not notified to Landmark within six months of the date of the issue becoming apparent and in any event, within twelve years of the date of the Service.
- You acknowledge that:-
 - Subject to clause 6.o below You shall have no claim or recourse against any Third Party Content supplier nor any of our other Suppliers. You will not in any way hold us responsible for any selection or retention of, or the acts of omissions of Third Party Content suppliers or other Suppliers (including those with whom We have contracted to operate various aspects or parts of the Service) in connection with the Services (for the avoidance of doubt Landmark is not a Third Party Content supplier). Landmark does not promise that the supply of the Services will be uninterrupted or error free or provide any particular facilities or functions, or that the Content will always be complete, accurate, precise, free from defects of any other kind, computer viruses, software locks or other similar code although Landmark will use reasonable efforts to correct any inaccuracies within a reasonable period of them becoming known to us;
 - Landmark's only obligation is to exercise reasonable skill and care in providing environmental property risk information to persons acting in a professional or commercial capacity who are skilled in the use of property and environmental information and You hereby acknowledge that You are such a person;
 - no physical inspection of the Property Site reported on is carried out as part of any Services offered by Landmark and Landmark do not warrant that all land uses or features whether past or current will be identified in the Services. The Services do not include any information relating to the actual state or condition of any Property Site nor should they be used or taken to indicate or exclude actual fitness or unfitness of a Property Site for any particular purpose nor should it be relied upon for determining saleability or value or used as a substitute for any physical investigation or inspection. Landmark recommends that You inspect and take other advice in relation to the Property Site and not rely exclusively on the Services.
 - Subject to clause 6.o below, Landmark shall not be

responsible for error or corruption in the Services resulting from inaccuracy or omission in primary or secondary information and data, inaccurate processing of information and data by third parties, computer malfunction or corruption of data whilst in the course of conversion, geo-coding, processing by computer or electronic means, or in the course of transmission by telephone or other communication link, or printing.

- Landmark will not be held liable in any way if a Report on residential property is used for commercial property or more than the one residential property for which it was ordered.
- The Services have not been prepared to meet Your or anyone else's individual requirements; that You assume the entire risk as to the suitability of the Services and waive any claim of detrimental reliance upon the same; and You confirm You are solely responsible for the selection or omission of any specific part of the Content;
- Landmark offer no warranty for the performance of any linked internet service not operated by Landmark;
- You will on using the Services make a reasonable inspection of any results to satisfy Yourself that there are no defects or failures. In the event that there is a material defect You will notify us in writing of such defect within seven days of its discovery;
- Any support or assistance provided to You in connection with these Terms is at Your risk;

- All liability for any insurance products purchased by You rests solely with the insurer. Landmark does not endorse any particular product or insurer and no information contained within the Services should be deemed to imply otherwise. You acknowledge that if You Order any such insurance Landmark will deem such as Your consent to forward a copy of the Report to the insurers. Where such policy is purchased, all liability remains with the insurers and You are entirely responsible for ensuring that the insurance policy offered is suitable for Your needs and should seek independent advice. Landmark does not guarantee that an insurance policy will be available on a Property Site. All decisions with regard to the offer of insurance policies for any premises will be made solely at the discretion of the insurers and Landmark accepts no liability in this regard. The provision of a Report does not constitute any indication by Landmark that insurance will be available on the property.

- Professional opinions contained in Reports are provided to Landmark by third parties, and such third parties are solely liable for the opinion provided. For the avoidance of doubt, those parties providing assessments or professional opinions on Landmark products include RPS Plc & Wilbourn Associates Limited, and any issues with regard to the provision of such opinion should be taken up with the relevant third party.

If Landmark provides You with any additional service obtained from a third party, including but not limited to any interpretation or conclusion, risk assessment or environmental report or search carried out in relation to a Report on Your Property Site, subject to clause 6.o below Landmark will not be liable in any way for any information contained therein or any issues arising out of the provision of those additional services to You. Landmark will be deemed to have acted as an agent in these circumstances and the supply of these additional services will be governed by the terms and conditions of those Third Parties.

- In any event no person may rely on a Service more than 12 months after its original date.
- If You wish to vary any limitation of liability as set out in these Terms, You must request such variation prior to ordering the Service. Landmark shall use its reasonable endeavours to agree such variation but shall not be obliged to do so.
- Time shall not be of the essence with respect to the provision of the Services.
- Ordnance Survey have undertaken a positional accuracy improvement programme which may result in discrepancies between the positioning of features used in datasets in the Services and the updated Ordnance Survey mapping. Subject to clause 6.o below, Landmark and its Suppliers exclude all and any liability incurred as a result of the implementation of such positional accuracy improvement programme.
- Where Landmark provides its own risk assessment in connection with any Report, Landmark shall carry out such assessment with all reasonable skill and care but shall have no liability for any such risk assessment conclusion which is provided for information only, save where Landmark conducted the same negligently, in which case the provisions of clause 6 shall apply. Notwithstanding the provision of any such risk assessment conclusion you should carefully examine the remainder of the Report and should not take or refrain from taking any action based solely on the basis of the risk assessment. For the avoidance of doubt, the provisions of this clause 6n apply solely to risk assessments conducted by Landmark, and the provision of any other risk assessment by a third party shall be governed by such third party's terms in accordance with the provisions of clause 6i above.
- Landmark obtains much of the information contained in its Report from third parties. Landmark will not accept any liability to You for any negligent or incorrect entry, or error or corruption in the Third Party Content supplied to Landmark, but Landmark's Suppliers may be liable for such

negligent or incorrect entries, or errors or corruptions, subject to the terms and conditions on which they supply the Third Party Content to Landmark.

7. Contribution

- Save where expressly provided, this clause 7 shall apply solely to Envirosearch Residential Reports (regardless of the result of such Report). Nothing in this clause 7 shall operate to override or vary the provisions of clause 6.
 - Landmark are prepared to offer, at their sole discretion, and without any admission or inference of liability a contribution towards the costs of any remediation works required under a Notice (as defined below) on the terms of this clause 7 ("the Contribution")
 - In the event that a Remediation Notice is served on the First Purchaser or First Purchaser's Lender of a Property Site under Part II(A) of the Environmental Protection Act 1990 ("the Notice") Landmark will contribute to the cost of such works as either the First Purchaser or First Purchaser's Lender (but not both) are required to carry out under the Notice subject to the provisions of this clause 7 and on the following terms:
 - the Contribution shall only apply to contamination or a pollution incident present or having occurred prior to the date of the Report;
 - the Contribution shall only apply where the Property Site is a single residential dwelling house or a single residential flat within a block of flats. For the avoidance of doubt, this obligation does not apply to any commercial property, nor to any Property Site being developed or redeveloped whether for residential purposes or otherwise;
 - the Contribution is strictly limited to the cost of works at the Property Site and at no other site.
 - the Contribution will not be paid in respect of any of the following:
 - Radioactive contamination of whatsoever nature, directly or indirectly caused by or contributed to or arising from ionising radiations or contamination by radioactivity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel or the radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof.
 - Asbestos arising out of or related in any way to asbestos or asbestos-containing materials on or in structures or services serving the structures.Naturally occurring materials arising from the presence or required removal of naturally occurring materials except in circumstances where such materials are present in concentrations which are in excess of their natural concentration.Intentional non-compliance arising from the intentional disregard of or knowing wilful or deliberate non-compliance by any owner or occupier of the Property Site with any statute, regulation, administrative complaint, notice of violation, or notice letter of any Regulatory Authority.
- Any condition which is known or ought reasonably to have been known to the First Purchaser or the First Purchaser's Lender prior to the purchase of the Report.
- Any condition which is caused by acts of War or an Act of Terrorism.
- Any property belonging to or in the custody or control of the First Purchaser which does not form a fixed part of the Property Site or the structure.
- Any fines liquidated damages punitive or exemplary damages.
- Any bodily injury including without limitation, death, illness or disease, mental injury, anguish or nervous shock.
- Any financial loss in respect of any loss of any rental, profit, revenue, savings or business or any consequential indirect or economic loss damage or expense including the cost of rent of temporary premises or business interruption.
- Any losses incurred following a material change in use of, alteration or development of the Property Site.
- The maximum sum that shall be contributed by Landmark in respect of any Contribution shall be limited to £60,000. In the event that more than one Report is purchased on the Property Site the Contribution will only be payable under the first Report purchased by or on behalf of any First Purchaser or First Purchaser's Lender and no Contribution will be made in respect of subsequent Reports purchased by or on behalf of such First Purchaser, First Purchaser's Lender or any person connected to them.
- Landmark shall only pay a Contribution where the Notice is served within 36 months of the date of the Report.
- Any rights to a Contribution under this Clause 7 are not assignable in the event of a sale of the Property Site and Landmark will not make any Contribution after the date of completion of such sale.
- In the event the First Purchaser or First Purchaser's Lender wishes to claim any Contribution, it shall notify Landmark in writing within 3 months of the date of the Notice. The First Purchaser or First Purchaser's Lender (as applicable) shall comply with all reasonable requirements of Landmark with regard to the commission and conduct of the remediation works to be carried out under the Notice, and in the event the First Purchaser or First Purchaser's Lender (as applicable) does not do so, including without limitation, obtaining Landmark's prior written consent to any estimates for such works or

complying with any other reasonable request by Landmark, Landmark shall not be required to pay any Contribution. Notwithstanding the payment of the Contribution by Landmark the First Purchaser or First Purchaser's Lender as applicable shall take all reasonable steps to mitigate any costs incurred in connection with the conduct of works required under the terms of any Notice.

- In the event that the First Purchaser or First Purchaser's Lender receives any communication from a statutory authority to the effect that there is an intent to serve a notice received under PartII(A) of the Environmental Protection Act 1990 they will advise Landmark within a maximum period of two months from receipt of such communication. This clause 7h and the service of any notice under it shall not affect the provisions of clauses 7 e and g, and any such communications, even if advised to Landmark will not operate as notice under clause 7e.
- Landmark reserve the right at any time prior to a claim for Contribution being made in accordance with clause 7 g) above, to withdraw the offer of payment of Contributions without further notice.

8. Events Beyond Our Control

- You acknowledge that Landmark shall not be liable for any delay, interruption or failure in the provision of the Services which are caused or contributed to by any circumstance which is outside our reasonable control including but not limited to, lack of power, telecommunications failure or overload, computer malfunction, inaccurate processing of data, or delays in receiving, loading or checking data, corruption of data whilst in the course of conversion, geo-coding, processing by computer in the course of electronic communication, or printing.

9. Severability

- If any provision of these Terms are found by either a court or other competent authority to be void, invalid, illegal or unenforceable, that provision shall be deemed to be deleted from these Terms and never to have formed part of these Terms and the remaining provisions shall continue in full force and effect.

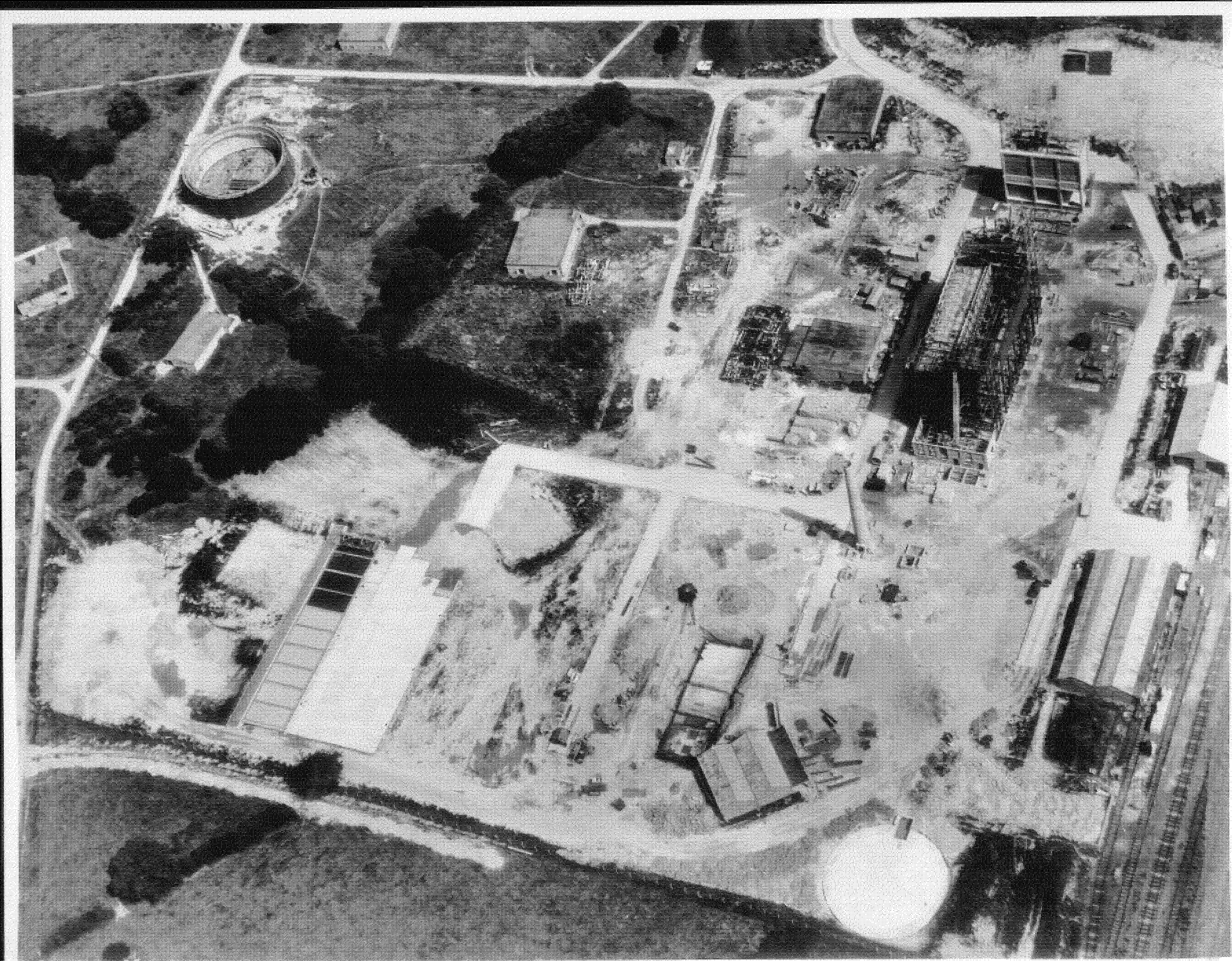
10. Governing Law

- These terms shall be governed by and construed in accordance with English law and each party agrees irrevocably submit to the exclusive jurisdiction of the English courts if any dispute arises out of or in connection with this agreement (a "Dispute") the parties undertake that, prior to the commencement of Court proceedings, they will seek to have the Dispute resolved amicably by use of an alternative dispute resolution procedure acceptable to both parties with the assistance of the Centre for Dispute Resolution (CEDR) if required, by written notice initiating that procedure. If the Dispute has not been resolved to the satisfaction of either party within 60 days of initiation of the procedure or if either party fails or refuses to participate in or withdraws from participating in the procedure then either party may refer the Dispute to the Court.

11. General; Complaints

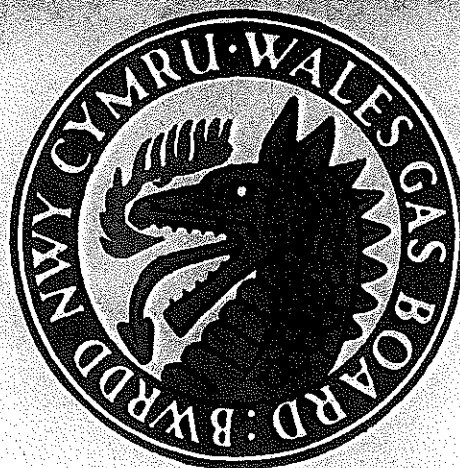
- Landmark may assign its rights and obligations under these Terms without prior notice or any limitation.
- Landmark may authorise or allow our contractors and other third parties to provide to Landmark and/or to You services necessary or related to the Services and to perform Landmark's obligations and exercise Landmark's rights under these Terms, which may include collecting payment on Landmark's behalf.
- No waiver on Landmark's part to exercise, and no delay in exercising, any right, power or provision hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any right, power or provision hereunder preclude the exercise of that or any other right, power or provision.
- Unless otherwise stated in these Terms, all notices from You to Landmark must be in writing and sent to the Landmark registered office (or in the case of an Authorised Reseller, to its registered office address) and subject to paragraph e below all notices from Landmark to You will be displayed on our Websites from time to time.
- Any complaints in relation to the Services should, in the first instance, be in writing addressed to the Customer Service Support Manager at the Landmark registered office. Landmark or its agents will respond to any such complaints in writing as soon as practicably possible.
- A person who is not a party to any contract made pursuant to these Terms shall have no right under the Contract (Right of Third Parties) Act 1999 to enforce any terms of such contract and Landmark shall not be liable to any such third party in respect of any Services supplied.
- Landmark's Privacy Policy as displayed on the Website governs the use made of any information You supply to Landmark.







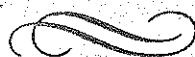




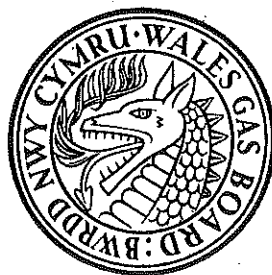
WREXHAM UNDERTAKING

OFFICIAL OPENING
OF
MAELOR GAS WORKS

BY THE
LORD LLOYD, M.B.E.
Parliamentary Under Secretary of State for
the Home Department and Welsh Affairs



14TH OCTOBER, 1953



WREXHAM UNDERTAKING



14TH OCTOBER, 1953

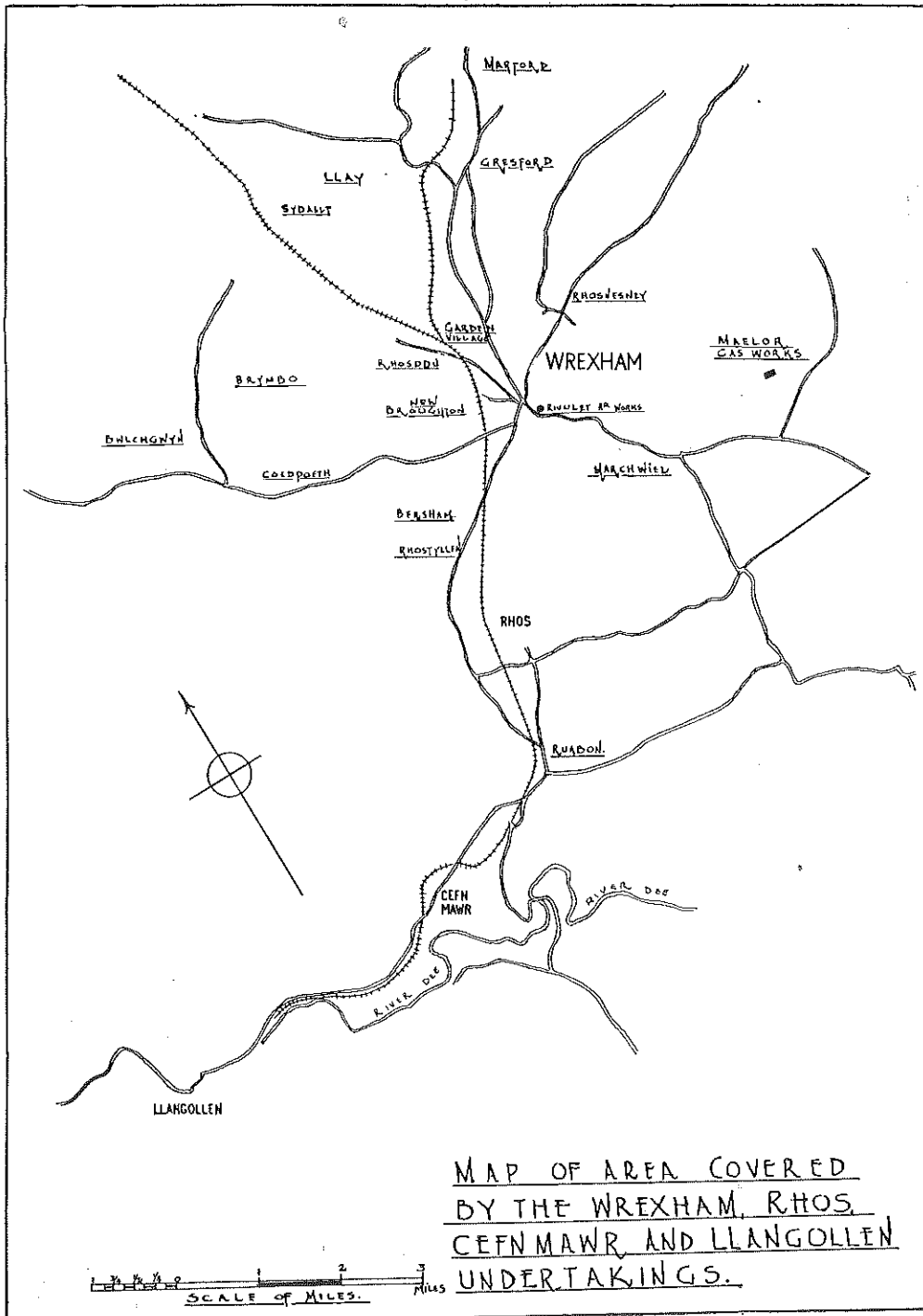
R. H. JOHNS LTD.
NEWPORT . MON.



THE LORD LLOYD, M.B.E.
Parliamentary Under Secretary of State for the Home Department and Welsh Affairs



MR. J. F. LLOYD, M. INST. GAS. E.
Engineer and Manager, Wrexham Undertaking



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HISTORY

GAS was first introduced in Wrexham in 1827 when Messrs. Keay, Edwards and Company provided gas lighting. In 1839 the Wrexham Gas and Coke Company was formed and took over the assets of the original suppliers at a cost of £705. A new works was then erected in Willow Road, total cost of various buildings amounting to £507.

The output of the works increased steadily and in 1869 a larger site was necessary. During the period 1869-70 the whole of the works was transferred to the present site in Rivulet Road. At this time the Company obtained its first Act of Parliament and became a Statutory Company under the name of the Wrexham Gaslight Co., the capital involved being £15,000 and the manufacturing plant consisting of 56 hand-charged horizontal retorts. The second Act of Parliament in 1905 changed its name to the Wrexham Gas Company.

During the years 1902-1907, the works were almost wholly rebuilt, new carbonising plant comprising 72 machine-charged horizontal retorts, purifying plant and a new gasholder of 500,000 cu. ft. capacity being installed.

The distribution side of the Undertaking was expanding rapidly and supplies were now made available to Coedpoeth and Rhostyllen. In 1912 the then new method of high pressure distribution was adopted for supplying outlying villages. By this means Rhosnessey and Gresford were supplied before the outbreak of the 1914-1918 War, whilst the supply to Brymbo was completed shortly after cessation of hostilities.

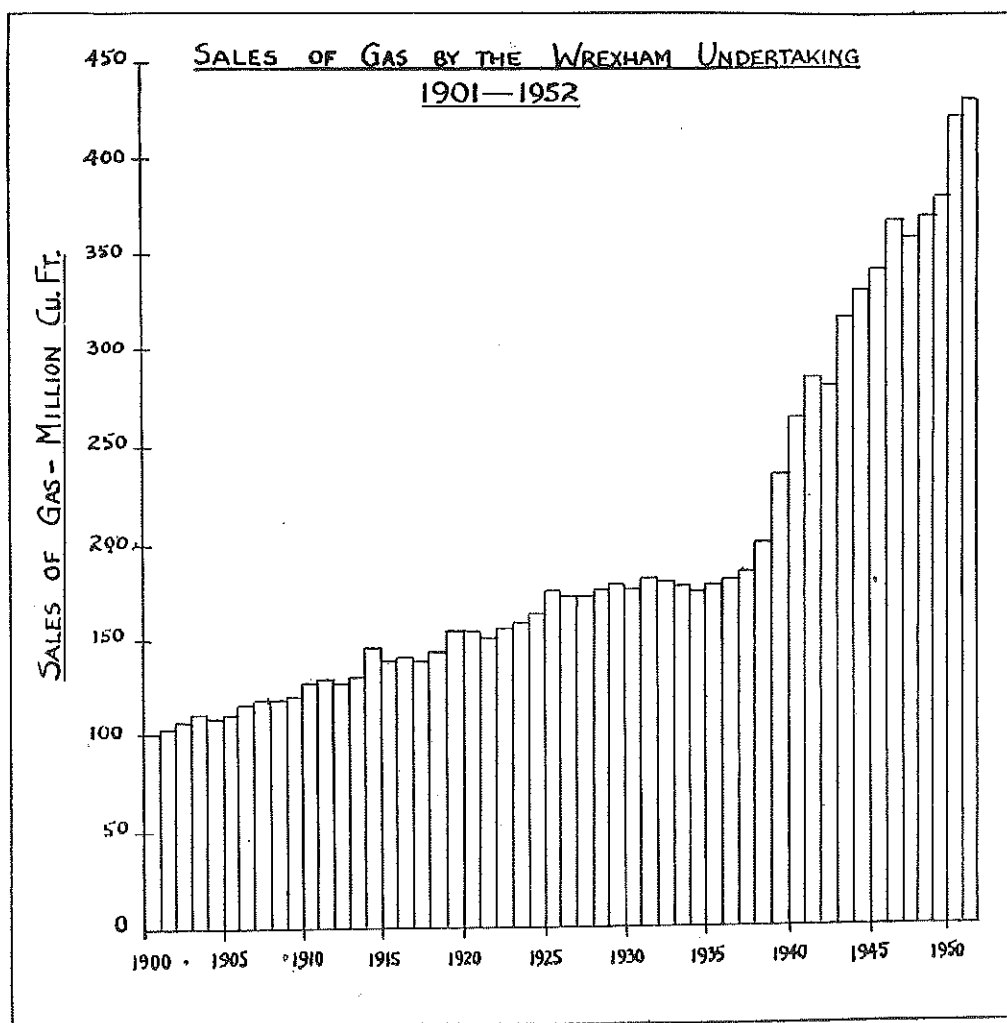
By 1938 the make of gas had increased from the 1900 figure of 100,000,000 cu. ft. per annum to 223,000,000 cu. ft.

The second World War brought about a rapid increase in gas consumption and new carburetted water gas plants were installed in 1943 and 1947 by which time the annual make of gas had increased to 406,000,000 cu. ft. Requests were also being received for bulk supplies of gas to the neighbouring Undertakings of Rhos, Cefn Mawr and Llangollen.

By reason of the state of the manufacturing plant, now forty years old, and of the continuing increasing demand for gas supplies, it became obvious that new plant was urgently required and permission was sought by the Company,

and obtained from the Ministry of Fuel and Power, for the construction of a modern Intermittent Vertical Chamber Oven Plant of 25 Chambers, with a capacity of 2,250,000 cu. ft. per day, on a site adjacent to the existing works. This plant was to be so arranged that a duplicate setting could be later added to give a total output of 4,500,000 cu.ft. per day. With the existing water gas plants a total maximum daily output from the present site of 6,000,000 cu. ft. was to have been possible.

This then was the position on 1st May, 1949, when the Wrexham Gas Company became vested in the Wales Gas Board under the Gas Act, 1948.



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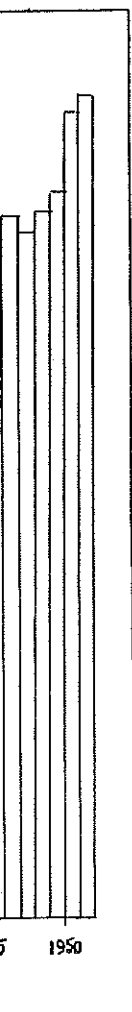
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Wrexham Gas
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It was now possible to review the gas supplies in the North Wales Area with a wider outlook, and as a result it was decided to choose a new site for the erection of the carbonising plant and to expand the proposals of the former Company to include the provision of the necessary purification, compressing, storage, steam raising, electricity generation and other ancillary plant on a new works which should not only supply gas southwards in the Rhos—Cefn Mawr—Llangollen area but also northwards to Mold, Buckley and Deeside.

In the Autumn of 1949 the Wales Gas Board acquired a site of 27 acres on the Wrexham Trading Estate some $3\frac{1}{2}$ miles south-east of the centre of the town for the purpose of erecting the Maelor Works.

NORTH WALES GAS GRID

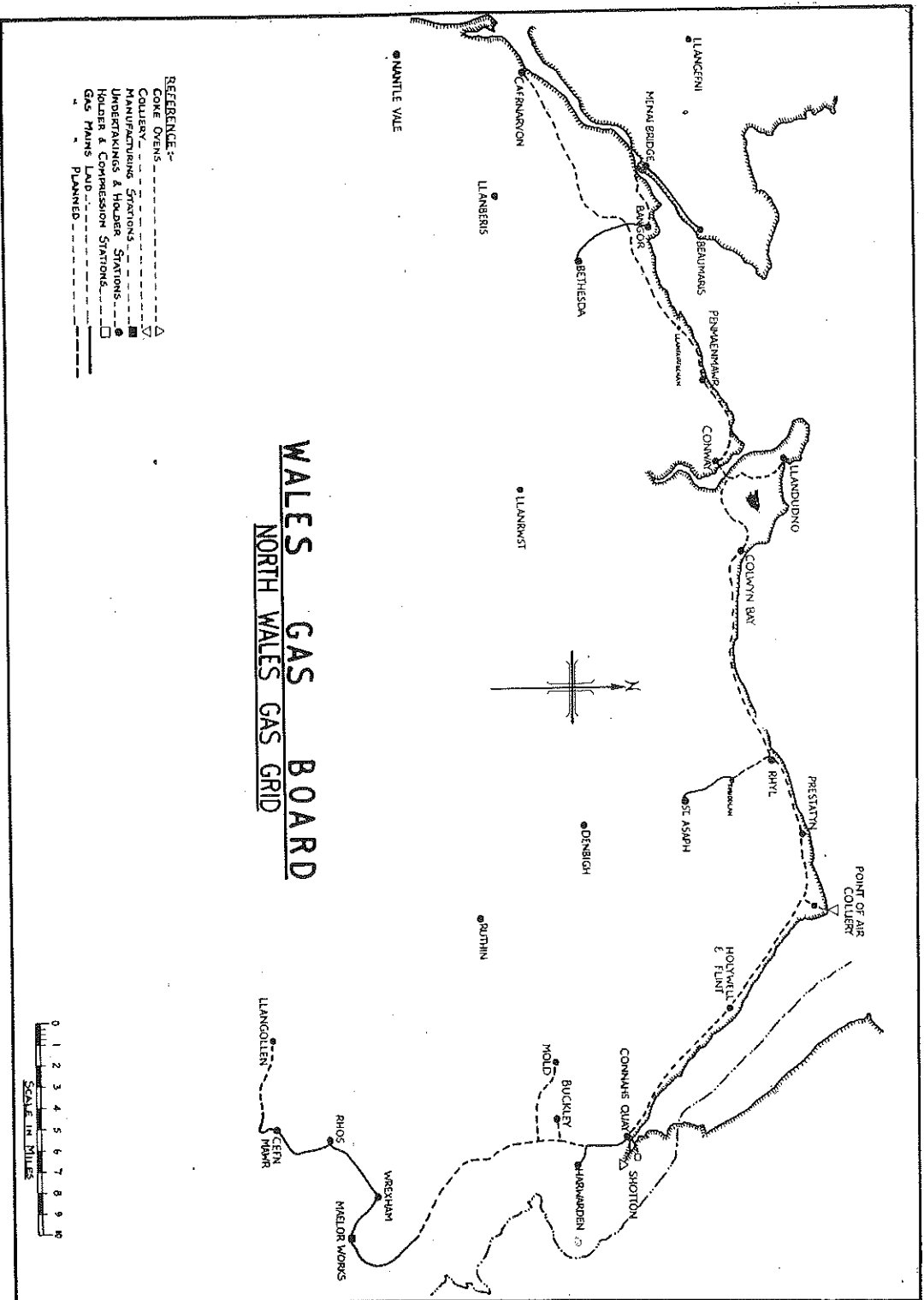
THE new gasworks at Maelor is an important part of the co-ordinated scheme that has been prepared for the integration of gas supplies in the North Wales area.

Initially the gas produced at Maelor will supply the needs of consumers in the Wrexham, Rhos, Cefn Mawr and Llangollen areas. The construction of mains for Rhos and Cefn Mawr has been completed, and the mains to Llangollen are well advanced.

When the main north from Wrexham—which is in process of being laid—is ready, gas from Maelor will meet part of the requirements of the consumers at Mold, Buckley and Deeside.

Reference to the drawing on page 10 will indicate the extent of the gas grid planned up to the present time : local sections of this grid have already been laid. It will be seen that the grid planned will be supplied with gas from three principal sources of supply, viz. Maelor Works, coke oven gas from the Shotton Works of Messrs. John Summers and Sons, Ltd., and Methane (or 'firedamp') drained from Point of Ayr Colliery and subsequently treated to render it suitable as Town's gas. The latter project is the first large scale development of a process new to Great Britain, and the use of Methane from Point of Ayr will save the Nation some 30,000 tons of coal annually. This large scale commercial experiment will assist in determining the extent of similar development elsewhere.

The planned grid system, extending through the Counties of Denbighshire, Flintshire and Caernarvonshire, and into Anglesey, will serve not only the



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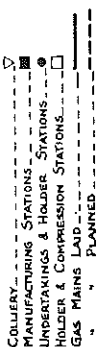
important developing industrial districts of Wrexham and Deeside, but also the North Wales coastal resorts as far as Caernarvon, with supplies to other communities. The system is designed so that further development can later proceed.

STATISTICAL INFORMATION

It is estimated that the Maelor Works will carbonise some 36,000 tons of coal per annum, producing 2,900,000 therms of gas, 18,000 tons of coke and 435,000 gallons of tar.

The area of supply of the Wrexham Undertaking alone covers approximately 38 square miles, some 80 miles of main being laid to serve 14,500 gas consumers. A further 8.5 miles of main have been laid to supply gas from Maelor to an additional 4,300 consumers in the areas served by the Rhos and Cefn Mawr Undertakings.

Extension of mains to serve Llangollen and the Deeside area north of Wrexham will add another 12,000 consumers to the mains system supplied from Maelor.



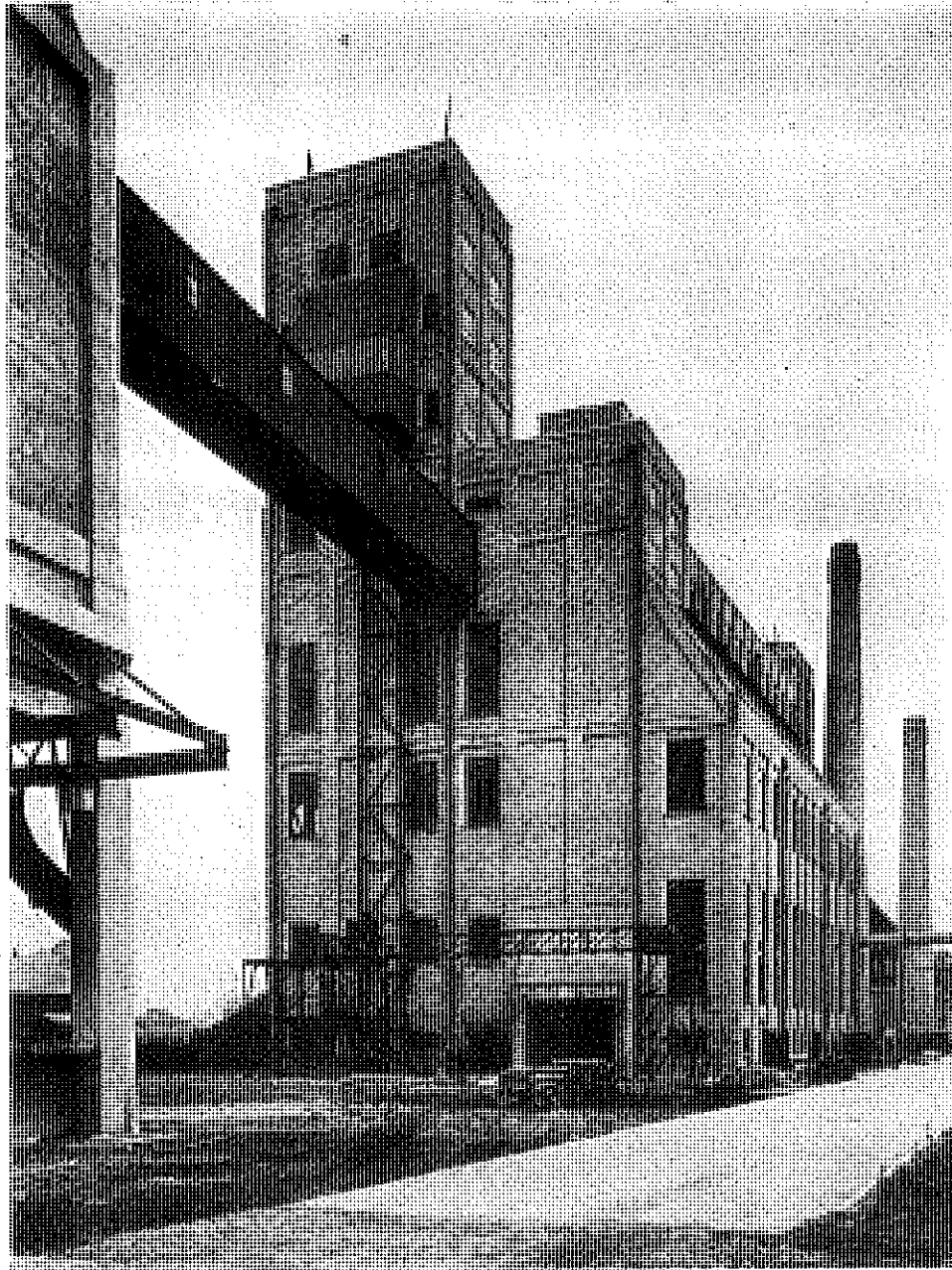


PLATE 1

General View of the Intermittent Vertical Chamber Oven Plant on the Coke Quenching and Handling Gable end; Belt Conveyor gantry and corner of R.C. coke screening and storage plant are shown.

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DESCRIPTION OF PLANT AND BUILDINGS

INTERMITTENT VERTICAL CHAMBER OVEN PLANT

THE Carbonising Plant is the fourth of its type to be installed in Wales, the others being Holywell (1933), Milford Haven (1936), and Abertillery (1937) ; selection of this type has been steadily growing in Great Britain over the last 20 years and particularly since the end of the World War II.

Intermittent Chambers are not limited to selected high grade coals but will deal adequately with a wide range, and particularly those of lower coking value, at the same time producing good yields of gas with a high degree of flexibility of output, and in particular a strong coke of low breeze content suitable for both domestic and industrial use.

The Carbonising Plant, complete with the necessary Coal and Coke handling equipment and Coke Grading, Storage and Loading plant has been designed and built by Messrs. W. J. Jenkins and Co., Ltd., of Retford, Notts.

The new installation consists of 25 chambers each of 3.65 tons capacity, arranged in one bench of five equal settings, and has a nominal maximum output of 2,250,000 cu. ft. per day. It is housed in a modern steel-frame brick-embellished building of pleasing architectural appearance and is designed for extension to double the present size in one or more stages. (See Plate 1).

COAL HANDLING PLANT

Coal brought to the site by road vehicles is discharged into an underground Receiving Hopper, from which it is extracted by means of a Feeder Conveyor of the De Brouwer type, either into a Coal Crusher or, in the case of small coal, into a by-pass chute, both of which discharge into a 40-ton per hour Elevator. From the Elevator the coal is discharged on to the first of two rubber belt conveyors, the second one running the full length of the overhead bunkers from which it is discharged by a travelling throw-off carriage. (See Plate 2). The overhead bunkers have a total storage capacity to cover 72 hours working and are completely enclosed to minimise dust nuisance and fire. Feeding doors in the bunker cover platforms are automatically opened and closed by a plough on the travelling throw-off carriage. Integral with these bunkers and extending

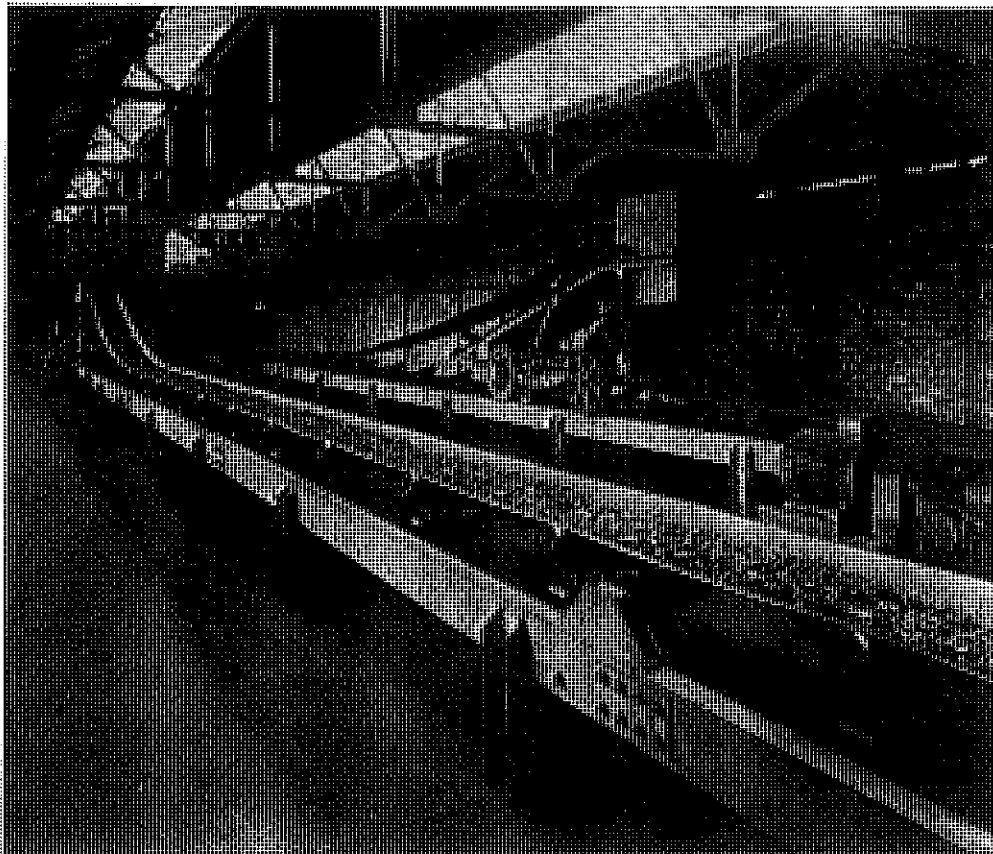


PLATE 2

Distributing Conveyors for Coal (foreground) and Coke (background), showing travelling throw-off carriages and the design of bunker top platform with plough operated filling doors.

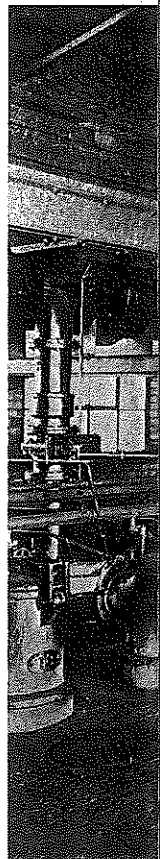
the full length of the bench are Coke Hoppers, also 72 hours storage capacity, for Producer fuel. The bunkers feed fuel through a series of outlets into a charging car which carries a measured quantity of coal for the charging of each chamber. This charging car is electrically propelled on an overhead track and is of special design to ensure uniform filling of each chamber to a pre-determined height. A compartment of the car contains small coke which is fed to each chamber to protect the bottom door ; interlocked levers ensure that this breeze feed is dropped in before the coal charge. (See Plate 3).

Provision has been made for the installation of a duplicate Coal Elevator ; either Elevator will feed the present bench or the future extension.

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BENCH AND BRICKWORK

The bench is made up of 5 equal settings each of 5 chambers ; each setting is heated by a built-in step grate producer and has its own secondary air recuperator. The whole is rigidly braced by massive vertical side and end buckstays with horizontal members, and longitudinal and transverse tierods which are spring loaded to control expansion.

The chambers are constructed of 95% silica and measure approximately 19 ft. 2 in. high by 9 ft. 10 in. wide and are tapered 10 $\frac{1}{4}$ "—13" on the minor axis. The chamber heating flues are formed by continuous tongued and grooved key tiles bonding adjacent chambers throughout the full width, thus forming an entirely monolithic structure which gives maximum strength in the oven walls

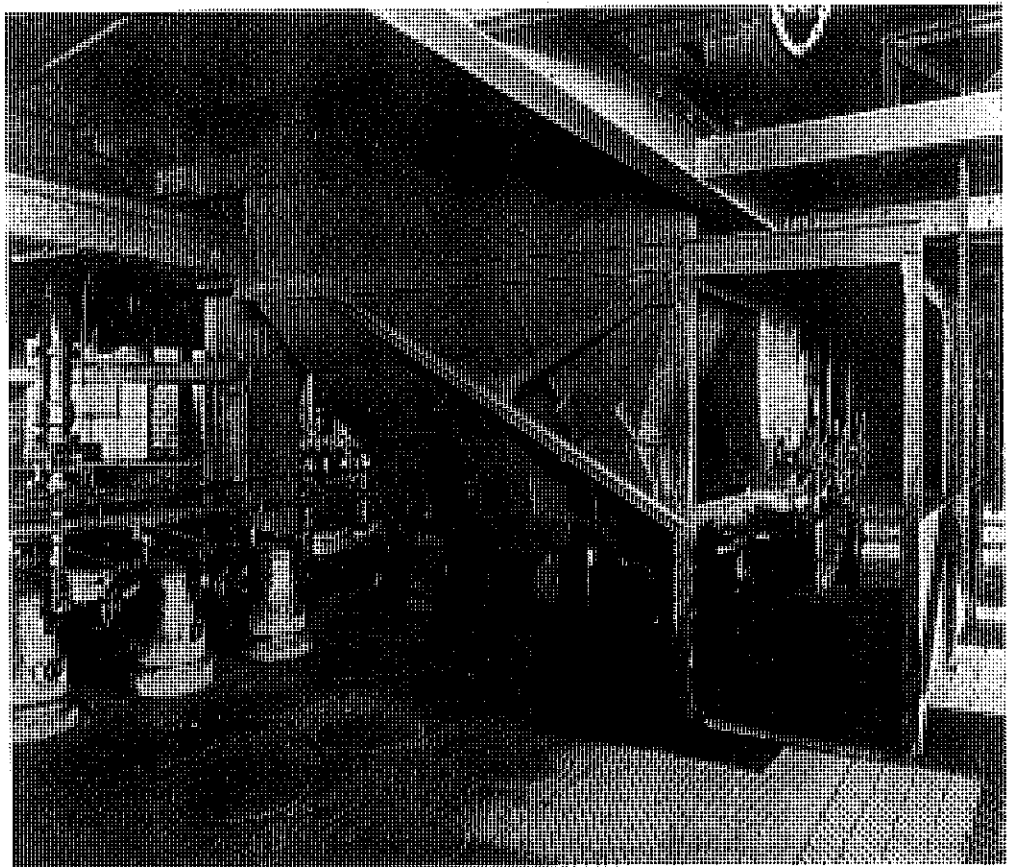


PLATE 3

Top of bench showing chamber charging car.

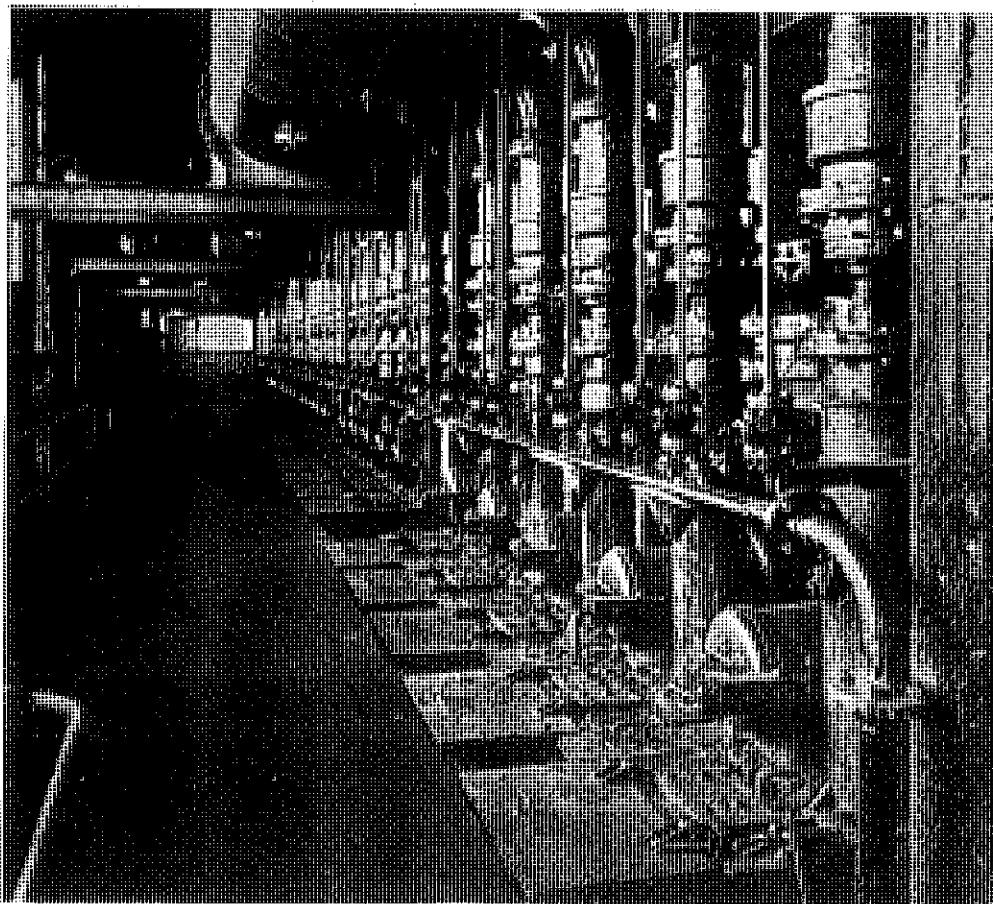


PLATE 4

Top Mains platform showing individual hydraulic mains.

to withstand the pressures exerted by strongly swelling coals. Expansion of the silica materials is provided for on the periphery of the silica work and this avoids the possibility of distortion thereby ensuring a long working life. The producer fittings are of the loose type to allow for expansion and to permit easy renewal. The recuperators are of the contra-flow type and a feature of this design, which gives absolute and easy control of temperature, is that each secondary air flue is entirely independent from the inlet slide to the combustion chamber. The settings are adequately insulated on bench top and side walls

GAS OFFTAKES AND DISCHARGE DOORS

Gas is taken away from the chambers by offtakes fitted at both top and bottom. Each top offtake feeds an individual hydraulic main from which the

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gas passes into a common collecting main (See Plate 4). The bottom gas offtake is of patented type and is actually formed in the dome of the bottom discharge doors. Along the length of the dome, which is virtually a semi-circular section pipe, there are a number of slots through which the gas flows to the collecting mains. (See Plate 5). Pressure in the lower part of the chamber is eliminated, thus permitting the use of water-sealed bottom doors. Counter balanced hand-operated closing gear is fitted to the bottom doors.

The gas offtakes, hydraulic mains, valves and collecting mains are continuously sprayed with hot ammoniacal liquor. Liquor is circulated by one of two pumps, one centrifugal type electrically driven, the other a reciprocating type steam driven which acts as a standby.

COKE QUENCHING AND HANDLING

At the conclusion of the carbonising period, coke is discharged from the chambers by manual opening of the bottom doors into a flat bottomed hot coke wagon which is traversed under the bench to the quenching tower by means of push button operated electrically-driven haulage gear. After quenching by a predetermined quantity of water, the wagon is removed from the quenching chamber and the coke discharged by hydraulically tipping the pivotted body of the wagon into a Receiving Hopper, from which it is extracted by means of a De Brouwer Conveyor, on which additional quenching can be carried out. This Conveyor discharges into a second hopper which feeds an electrically driven automatic Skip Hoist elevating the coke to a hopper in the Chamber House. From this hopper a reciprocating feeder delivers the coke onto a high speed vibratory screen where all material below $\frac{1}{2}$ " is removed, this being directed into a compartment of the overhead bunkers for use as the protecting pad for the bottom doors of the chambers before coal is charged into them.

The coke passing over the screen can then be either taken to the distributing conveyor over the bunkers in the Chamber House, for producer fuel, shown in Plate 2, or directly to the coke grading and storage plant.

COKE GRADING AND STORAGE PLANT

A Belt Conveyor from the Chamber House conveys this coke to a reinforced concrete building composed of screen house and bunkers of 350 tons capacity. On reaching the screening house, the coke first passes over a scalping screen which removes the fraction over 3" which flows via a spiral anti-breakage chute directly into the large coke compartment.

The coke below 3" passes on to a main grading screen of the balanced reciprocating type, which grades into four sizes :—0— $\frac{1}{2}$ ", $\frac{1}{2}$ —1 $\frac{1}{4}$ ", 1 $\frac{1}{4}$ "—2", 2"—3", spiral anti-breakage chutes again being employed for the two larger sizes of coke.

The cones of the bunker are lined with special hard burnt tiles and are fitted with discharge doors below which are vibratory screens and loading chutes. All sizes of coke (except breeze) are re-screened to remove breeze and smalls, before being loaded to road or rail vehicles or into bags.

WASTE HEAT RECOVERY

The bench is equipped with a Spencer Bonecourt Waste Heat Boiler generating steam at a pressure of 150 lbs. per sq. in., the boiler being complete with electrically driven draught fan, feed pump and automatic boiler feed controls. This Boiler deals with the full output of waste gas from the bench ; a brick chimney deals with the waste gas during the boiler overhaul but provision has been made for the later addition of two more boilers.

GENERAL

The whole plant has been designed to ensure economical working as regards fuel and power and labour requirements and is very fully instrumented for ease of control.

Much thought has been given to the ease of operation and comfort of the stokers ; adequate natural and artificial lighting is ensured with roomy platforms and staircases and a goods/passenger lift gives access to all levels. Mess, locker and bathing and lavatory accommodation have all been provided in the building.

BUILDINGS

When the site was taken over it held several buildings that had been erected during the War while the site was part of the Ordnance Factory. These are mostly in fair condition and a serious endeavour was made to use some or all of them for works' purposes. They had been erected for a special purpose and it was found that, except as stores and one building to be made into a repair shop, they were unsuitable for gas works' purposes.

Four of these buildings have had to be removed.

Four new buildings have been erected ; the Retort House which has already been described, the Carburetted Water Gas House, Compressor and Power House, and the block containing the laboratory and offices, which are all described in later sections.

ROADWAYS AND YARDS

The site has a clay subsoil and in wet weather is impassable to vehicles.

The whole of roadways and yards where vehicular traffic is expected have been covered with an 8" layer of reinforced concrete, carefully laid and drained.

CARBURETTED WATER GAS HOUSE

This is a sheeted building of brick and steel frame construction and is so designed that protection is given to overhead bunkers for water gas plant and boiler fuel within the building.

The building houses two solid fuel boilers and is intended to accommodate Two-750,000 cu. ft. per day capacity carburetted water gas sets that are to be transferred to Maelor from the existing Rivulet Road Works in Wrexham.

A separate blower room for the water gas plant is provided in the building.

The building is designed to hold a third boiler and Two-1,750,000 cu. ft. per day capacity carburetted water gas sets (in place of the present 750,000 cu. ft. sets), and for extension if required.

SOLID FUEL BOILERS

The boiler installation in the carburetted water gas house consists of 2 Economic Boilers, 16' long $\times$ 10' 6" dia., fitted with Oldbury Chain Grate Stokers for firing Coke Breeze. Automatic control of feed water level is provided, together with comprehensive panel of recording instruments. The boilers are fitted with forced draught and induced draught fans, grit arresters and superheaters. Each boiler is rated at 6,000 lbs. of steam per hour when firing Coke Breeze. Steam is generated at 150 lbs. per sq. in. and superheated, as in the case of the Retort House waste heat boiler.

COMPRESSOR AND POWER HOUSE

This new brick building of modern design houses gas exhausting and compressing plant and a bulk supply gas meter in one section, and in an entirely separate section electricity generating plant, switchboard and high tension equipment for the electro-detarrer.

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EXHAUSTERS AND COMPRESSORS

Two steam driven Rootes type exhausters, each of 200,000 cu. ft. per hour capacity, are installed for handling coal gas or carburetted water gas, or a mixture of these gases.

Overhead gas connections are so arranged that the present units can be replaced by larger machines at some future date if required.

COMPRESSORS

The compressor installation consists of two steam-driven Rootes type compressors, capable of handling 120,000 cu. ft. of gas per hour against 7 lbs./p.s.i. pressure, for supplying gas to the Wrexham district and into the grid main supplying gas to Rhos, Cefn Mawr and Llangollen.

One steam-driven vertical reciprocating compressor, capable of handling 70,000 cu. ft. of gas per hour against 15 lbs. p.s.i. pressure, is also provided for supplying gas north to the Deeside Undertakings.

A Connersville meter with a rating of 150,000 cu. ft. per hour, is installed for metering under pressure the gas supplied into the grid main running north from Wrexham.

There is room in this section of the compressor and power house for the installation of two more exhausters and an additional compressor, at some future date.

ELECTRICITY GENERATING PLANT

Two-250 kilowatt alternator sets, driven by 365 B.H.P. compound condensing steam engine are provided.

A small diesel engine-driven alternator set is provided for emergency use.

A 10-ton overhead travelling crane is installed.

LABORATORY AND OFFICE BLOCK

This is a flat-roofed brick building, adjacent to the purification plant, which will contain Laboratories, Fairweather Calorimeter Room and offices for Works' Management and Technical Staff.

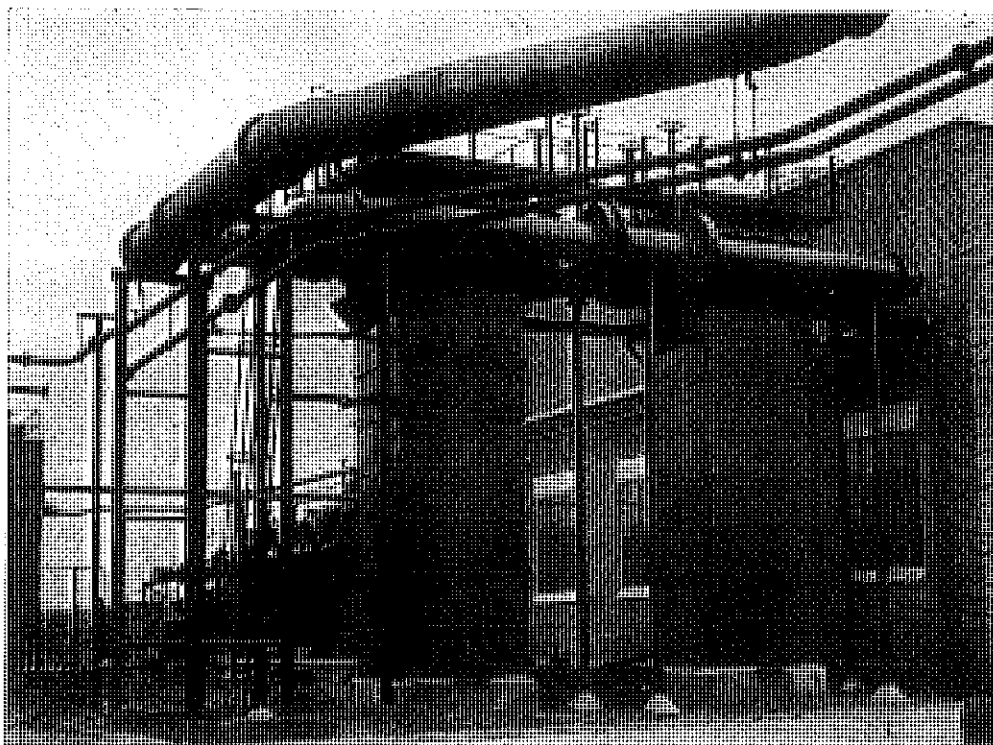


PLATE 6 — CONDENSERS

ANCILLARY PLANT

CONDENSERS

Two vertical water-cooled condensers, of 5,000,000 cu. ft. per day capacity, are provided. (See Plate 6).

Each condenser consists of a mild steel vertical chamber measuring $6' 7\frac{1}{2}''$ x $5' 6\frac{3}{4}''$ x $25' 6''$ high with vertical water tubes and 24" dia. gas connections.

Automatic control of the outlet gas temperature is provided by means of thermostatically-operated cooling water supply valve.

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DETARRER

The detarrer is installed in the gas stream at outlet of exhausters and is designed to handle 5,000,000 cu. ft. of gas per day with 99% efficiency of removal of tar fog. (See Plate 7).

The detarrer consists of a mild steel circular vessel, 6' dia. x 26' high and is fitted with 24" gas connections.

The electrical equipment is fitted with safety interlocking gear and consists of transformer, rectifier and control panel situated in the power house.

AMMONIA WASHER

The ammonia washer consists of a static type washer in two sections, of all steel construction, with 24" valves and connections, designed for a capacity of 5,000,000 cu. ft. per day. Each section measures 10' 8" x 5' 4" x 13' 1" high and contains 4 washing bays packed with board filling.

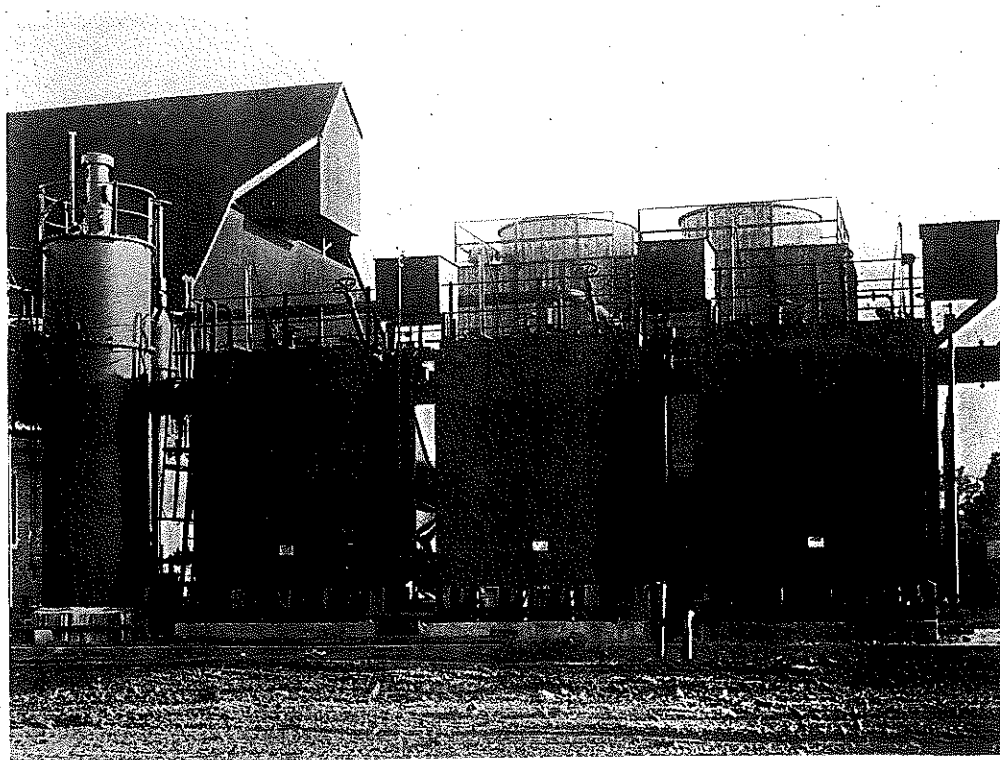


PLATE 7—DETARRER AND STATIC WASHERS

Individual liquor circulating pumps are provided for each bay, there being a separate electric motor and counter-shaft for each section.

NAPHTHALENE WASHER

This consists of a single mild steel rectangular vessel, board filled, with 4 bays, overall dimensions being 10' 8" x 5' 4" x 13' 1" high, designed for a capacity of 5,000,000 cu. ft. per day. Valves and connections of 24" dia. are provided with electric motor and circulating pumps as for the Ammonia washers.

This washer stands in line with and is of similar design to the ammonia washers.

PURIFIERS

Five reinforced concrete ground level purifiers are installed with suitably braced steel lids, each box measuring 35' x 35' x 6' deep. There are two lids to each box and the purifying material is carried on two layers of grids.

The five boxes are arranged for series rotation through 20" dia. valves and connections, with split flow to each box. A gas heater is provided on the main inlet to the purifiers.

A travelling gantry is provided for lifting the lids when the purifiers are to be emptied and filled.

Oxide handling will be by means of a 24 R.B. Diesel-driven crane with special bucket.

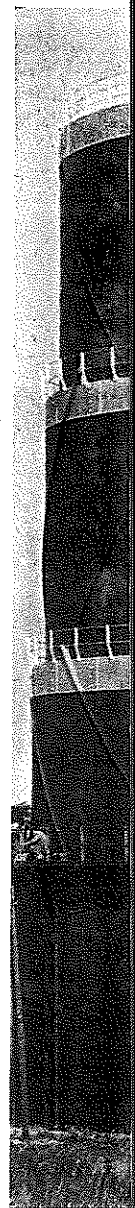
STATION METER

A Connersville Station Meter with a rated capacity of 200,000 cu. ft. per hour is provided on inlet holder, with valves and connections of 20" dia.

TOWN'S GASHOLDER

The main gasholder has three spirally guided lifts in a steel tank and when fully inflated has a capacity of 500,000 cu. ft. It is equipped with 30" dia. valves and connections and is of rivetted construction. (See Plate 8).

Anti-flood pipes are provided on the inlet and outlet mains, as well as a safety by-pass governor between inlet and outlet.



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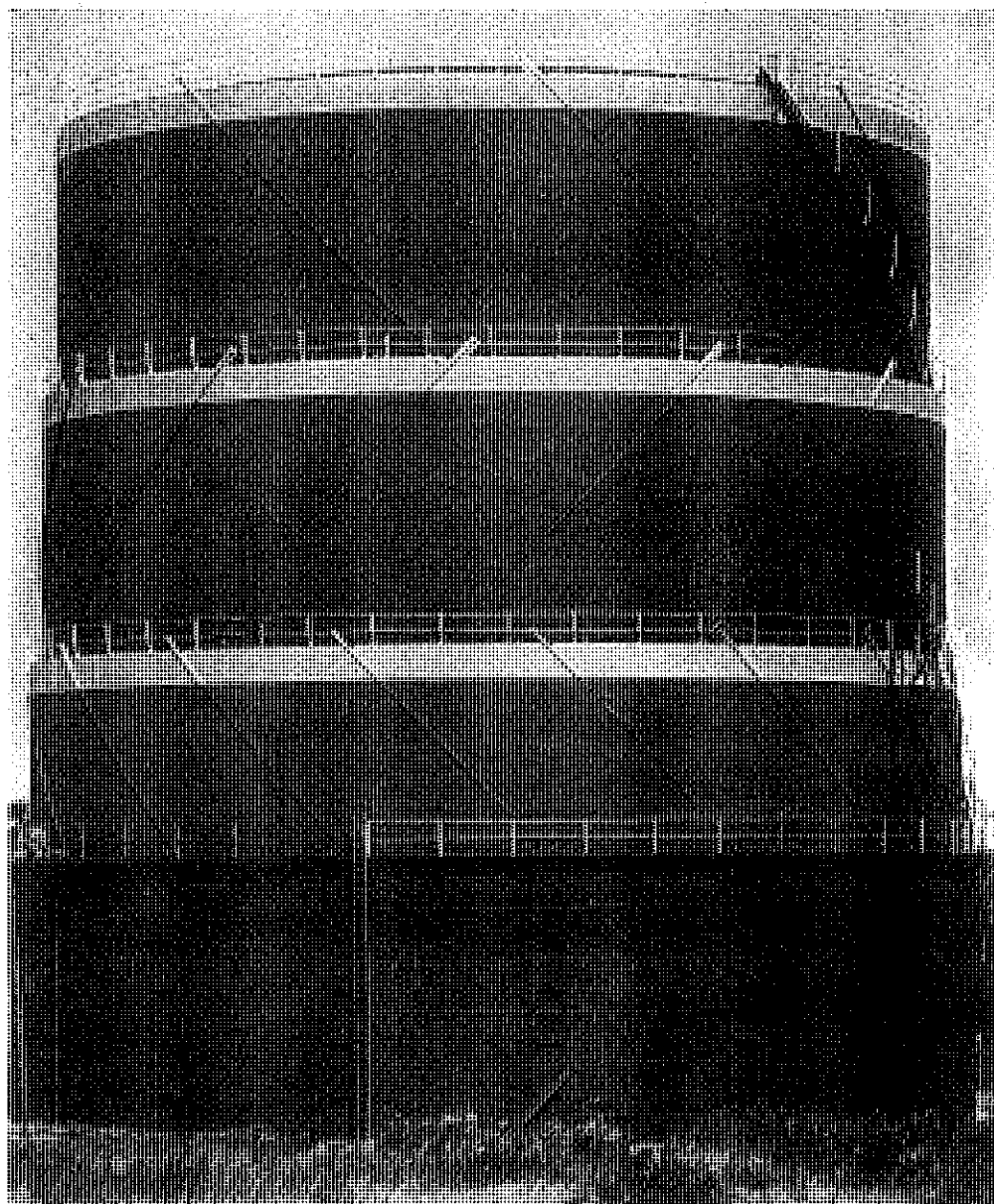


PLATE 8 — 500,000 CU. FT. GASHOLDER

The practice of using hot enamel for protecting parts of the holder exceptionally liable to corrosion, as adopted at Pontypool has been repeated in the case of this holder.

The principal dimensions of the holder are :—

Inner Lift	88' 2" dia.	x 27' 9" deep.
Middle Lift	90' 10" „	x 27' 9" „
Outer Lift	93' 6" „	x 27' 9" „
Steel Tank	96' 0" „	x 28' 6" „

The pressure thrown by the holder is 13.4" when fully inflated.

CARBURETTED WATER GAS RELIEF HOLDER

A two-lift spirally guided holder in steel tank, of all welded construction, with a capacity of 250,000 cu. ft. is provided for storage of carburetted water gas prior to its being mixed with the coal gas stream.

The following are the principal dimensions :—

Inner Lift	77' 0" dia.	x 27' 3" deep.
Outer Lift	79' 8" „	x 27' 3" „
Steel Tank	81' 11" „	x 27' 9" „

GAS DEHYDRATION PLANT

A calcium chloride gas-drying plant is provided on outlet holder, having a capacity of 5,000,000 cu. ft. per day. Valves and connections are 24" dia. The plant consists of a cast iron static washer of 4 chambers, brush-filled, dimensions 4' 6" x 10' x 15' high. The plant is provided with rack cooler, pumps, storage tanks and concentrator for calcium chloride.

WATER COOLING TOWER

An induced draught water cooling tower, capable of dealing with 45,000 gallons of water per hour, is installed to allow for re-circulation of condenser cooling water. The tower is of rectangular timber construction, with board filling, and stands over a reinforced concrete water basin which forms its foundation.

Two electrically-driven centrifugal water circulating pumps with 9" water connections are provided.

LIQUOR CONCENTRATION PLANT

A liquor concentration plant for the automatic production of concentrated liquor of 20% ammonia content, and capable of dealing with 20,000 gallons per hour of crude liquor, is provided.

A cylindrical storage tank of 11,000 gallons capacity is provided for storing the concentrated liquor.

TAR AND LIQUOR STORAGE

Underground storage for the tar, crude liquor and the effluent from the concentrated liquor plant, is provided by an underground reinforced concrete tank, having a total capacity of 280,000 gallons.

A mass concrete foundation forms the bottom of the tank and the tank is covered by a reinforced concrete roof which carries the detarrer and static washers for removal of ammonia and naphthalene.

Tar and liquor pumps and necessary connections are also carried on the tank top.

Incoming tar and liquor passes through an underground separating tank, capacity 6,000 galls., adjacent to the main storage tank.

WEIGHBRIDGE

A 30-ton platform road vehicle weighbridge is provided at the entrance to the works.

STEAM AND POWER

Works' steam requirements will be met by recovery of heat from the flue gases leaving the retort bench by means of waste heat boiler in the Retort House.

This boiler has a rated capacity of 7,500 lbs. of steam per hour at 150 lbs. p.s.i., and superheated to 500°F.

An alternative and supplementary source of steam supply will be provided by two Economic Boilers in the water gas plant house which are equipped with chain grate mechanical stokers for Breeze firing.

These boilers are each rated at 6,000 lbs. of steam per hour when firing Breeze, also at 150 lbs. p.s.i. and 500°F. superheat.

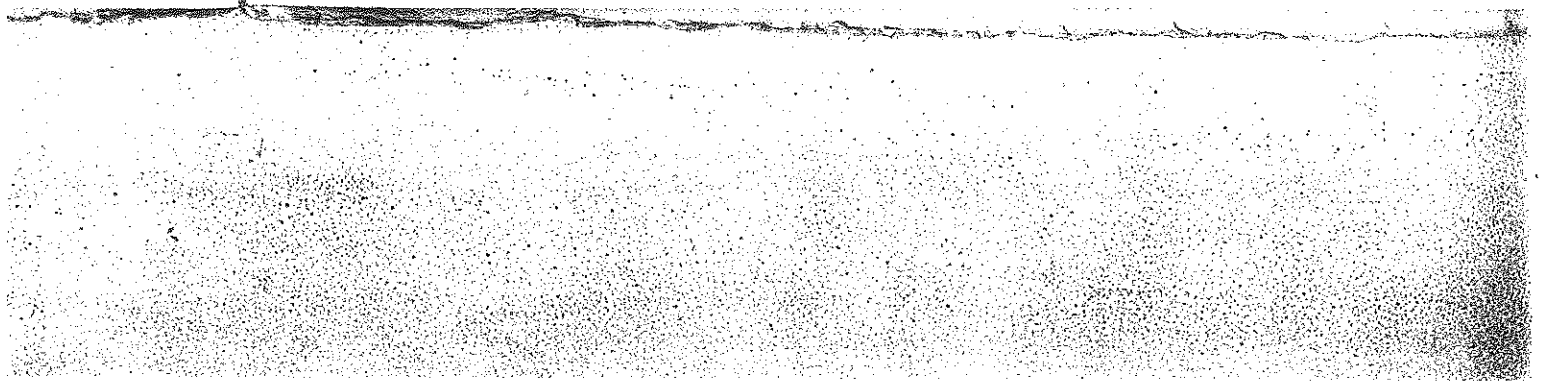
Steam used for driving exhausters, compressors and boiler feed pumps is exhausted at 30 lbs. p.s.i. to provide a supply of low pressure steam for process work.

Electricity is generated by alternators driven by compound steam engines which are condensing.

All other machinery on the works is electrically driven.

WALES GAS BOARD
WREXHAM UNDERTAKING
MAELOR WORKS — SITE LAYOUT

engines



LIST OF MAIN CONTRACTORS

Intermittent Vertical Chamber	
Oven Plant	W. J. JENKINS & Co., LTD.
Coke Grading Plant	W. J. JENKINS & Co., LTD.
Condensers	WHESOE, LTD.
Detarrer	WHESOE, LTD.
Ammonia Washer	WHESOE, LTD.
Naphthalene Washer	WHESOE, LTD.
Purifiers	PETER LIND & Co., LTD.
Station Meter	W. C. HOLMES & Co., LTD.
Gas Dehydration Plant	W. C. HOLMES & Co., LTD.
Concentrated Liquor Plant	W. C. HOLMES & Co., LTD.
Gas Holders	DRUMMOND & Co. WHESOE, LTD.
Economic Boilers	FOSTER, YATE & THOM, LTD. EDWIN DANKS & Co., LTD. (Chain Grate Stokers). UNIT SUPERHEATER & PIPE Co., LTD. (Superheaters). CLYDE BLOWERS, LTD. (Soot Blowing Equipment). DAVIDSON & Co., LTD. (Induced Draught Fans and Grit Arresters). G. & J. WEIR, LTD. (Feed Pumps).
Carburetted Water Gas House	T. C. JONES, LTD. (Steelwork). WM. HALL & SON, LTD. (Brickwork). HUMPHREYS & GLASGOW, LTD. (Skip Hoist and Coke Chutes). T. E. WARRINGTON, LTD. (Chimney).
Compressor and Power House	T. C. JONES, LTD. (Steelwork). WM. HALL & SON, LTD. (Brickwork).
Exhausters and Compressors	GEO. WALLER & SON. BRYAN DONKIN Co., LTD.
Steam Engines	BELLISS & MORCOM, LTD.
Alternator Sets	BELLISS & MORCOM, LTD.
Electrical switchgear and cables	THORNTONS, WREXHAM.
Steam Pipe Lines	UNIT SUPERHEATER & PIPE Co., LTD. VERSIL LTD. (Insulation).
Gas Mains	STEWARTS & LLOYDS, LTD.
Gas Valves	WESTWOOD & WRIGHTS, LTD.
Site Preparation, Roads, Fencing and Drainage	WHITLEY BROS.
Foundations	W. J. JENKINS & Co., LTD. (F.C. Construction Co.) PETER LIND & Co., LTD. A. MONK & Co., LTD.

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Cement	.	.	.	TUNNEL PORTLAND CEMENT CO.
Roof Sheetting	.	.	.	ROBERTSON THAIN, LTD.
Consultants	.	.	.	SOIL MECHANICS, LTD.
				SCOTT & WILSON.
				VULCAN BOILER & GENERAL INSURANCE CO., LTD.
				BRITISH ENGINE BOILER & ELECTRICAL INSURANCE, CO.,
				LTD.
Architects	.	.	.	W. J. JENKINS, LTD.
				E. COLWYN FOULKES, Colwyn Bay.

A large amount of work has been carried out by the Board's own staff. This includes pipe fitting and plumbing work on gas, water and liquor services and other general pipework, together with painting and final preparation of the site and plant for full operation.

Appendix K
QA/QC Laboratory Data

Method Statements for Wrexham Project:

DETS 046 (DETSC 1004): MOISTURE CONTENT/LOSS ON DRYING OF SOIL

Loss on drying is determined by loss of mass on drying in an oven set at 28°C or 50°C. Moisture content is determined by loss of mass on drying in an oven set at 105°C. The procedure is carried out during the sample preparation stage.

DETS 062 (DETSC 3321): BTEX, MTBE & PRO IN SOILS BY HEADSPACE GC-FID

BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.

DETSC 1003: STONE AND GLASS/METAL/PLASTIC CONTENT OF SOIL

The Stone and Glass/Metal/Plastic content of soil samples is carried out during the sample preparation stage. A defined weight of sample is sieved and all stone/glass/metal/plastic from the portion removed and weighed.

DETSC 1101: ASBESTOS BULK ANALYSIS

Samples are examined visually for the presence of asbestos containing materials or asbestos fibres. Suspect fibres are removed from the sample and examined using polarised light microscopy to determine whether they are asbestos fibres.

If no asbestos fibres are identified by the method after an adequate length of examination time, and after at least two small pinch samples have been examined, then the sample may be reported as 'NAD' (no asbestos detected).

DETSC 1102: GRAVIMETRIC QUANTIFICATION OF ASBESTOS IN SOILS, LOOSE AGGREGATES AND BALLAST

The method of quantification is divided into three procedures: Gravimetric analysis, detailed gravimetric analysis and PCOM analysis. The analysis may be affected by the client's requirements as determined by contract review, and by the nature of the asbestos found in the sample, e.g. whether ACMs are present, and whether fibre bundles large enough to pick out using tweezers are have been found in the sample.

Gravimetric Analysis

The entire sample is weighed using a calibrated balance, and then examined inside a fume cabinet. Any items that may contain asbestos are removed from the sample for identification. All suspect ACMs are identified using stereomicroscopy and Polarised Light Microscopy as described in DETSC 1101 and HSG 248. Items confirmed as containing asbestos are weighed using a calibrated balance, and the mass percentage ACM content of the sample is calculated. The asbestos content of the sample is then calculated based on the typical asbestos content of the particular ACMs found, with reference to HSG 264, Appendix 2.

DETSC 1102 GRAVIMETRIC QUANTIFICATION OF ASBESTOS IN SOILS, LOOSE AGGREGATES AND BALLAST (Continued)

Detailed Gravimetric Analysis

Any bundles of asbestos fibres observed during asbestos identification analysis that are large enough to be removed using tweezers are removed and weighed using a calibrated balance. The mass% asbestos in the subsample is calculated, and the total mass% in the entire sample is calculated based on the relative weights of the greater than/less than 1cm fractions. The analyst should spend no more than approximately 20 minutes on the detailed gravimetric analysis. If bundles are too numerous to pick out then PCOM analysis should be undertaken.

PCOM Analysis

If asbestos fibres are still present in the subsample following the detailed gravimetric analysis stage, or if the clients' requirements state that it should be carried out, PCOM analysis can be undertaken in order to assess the mass% and / or number of free fibres. A known mass of between 8g and 12g is removed and made up to 1000ml using water. The mixture is stirred for 1 hour using a magnetic stirrer then a known quantity is filtered through four cellulose-ester filter papers. Each filter is then placed onto a microscope slide, allowed to air dry, and then cleared and fixed using the acetone/triacetin method described in HSG 248. The slides are then evaluated using PCOM. From the number and size of the fibres observed on the slides the mass percentage of asbestos in the sample is estimated, and, if required, the number of potentially respirable fibres calculated.

DETSC 2003: LOSS ON IGNITION

Soil is ignited at 440°C ±25°C and the amount of sample lost on ignition is determined gravimetrically. Other specified temperatures may be used but are not accredited.

DETSC 2008: pH VALUE OF SOIL AND WATER

The pH value of a soil suspension in water or of a groundwater or leachate sample is determined by the electrometric method using a glass electrode.

DETSC 2009: ELECTRICAL CONDUCTIVITY OF SOIL AND WATER

The electrical conductance of a soil suspension in water or of a water sample is determined by voltammetry using a conductivity meter.

In some cases, the soil may need to be extracted with an aqueous solution of an inorganic salt e.g. the conductivity of topsoil is determined by preparing a suspension of the soil in saturated calcium sulphate.

DETSC 2033: TOTAL AND DISSOLVED ORGANIC CARBON IN WATER

The term TOC (Total Organic Carbon) is used to describe the total content of organically bound carbon in dissolved and undissolved compounds. The TOC content is expressed in mg/l. If DOC (Dissolved Organic Carbon) is required, samples are filtered through a 0.45µm filter paper prior to analysis.

Inorganic carbon is expelled by acidification of the sample. TOC is then determined by digestion of the sample with sulphuric acid and peroxodisulphate. Carbon containing compounds are transformed into carbon dioxide. The carbon dioxide evolves and reacts with an indicator solution. The colour change is measured using a spectrophotometer.

DETSC 2034: SUSPENDED AND SETTLEABLE SOLIDS IN WATER

Suspended matter is removed from a measured volume of sample by filtration under reduced pressure through a pre-treated, pre-weighed glass fibre filter paper. The paper is washed with deionised water to remove dissolved salts and the total suspended matter is determined gravimetrically after drying at $105 \pm 5^\circ\text{C}$

Settleable solids are determined by subtracting the solids left in suspension after settlement for 1 hour (or other agreed time) from the total suspended matter in the sample.

DETSC 2055: ANIONS IN WATER AND AQUEOUS SOIL EXTRACTS BY ION CHROMATOGRAPHY

Groundwater, wastewater, leachate samples and aqueous soil extracts are filtered through a $0.22\mu\text{m}$ syringe filter. The filtered samples are injected into an Ion Chromatograph. The anions of interest are separated on the basis of their affinity for the active sites of the column packing material. The separated anions are converted into their highly conductive acid forms and measured by conductivity. The anions are identified on the basis of retention time as compared to standards and quantisation is by measurement of peak area.

DETSC 2076: SULPHATE AND MAGNESIUM CONTENT OF 2:1 AQUEOUS EXTRACT OF SOIL BY ICP-OES

The sulphate and magnesium in the soil are extracted in an aqueous extract having water: soil ratio of 2:1 and the insoluble material is removed by filtration. The concentrations of sulphate and magnesium in the filtrate are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelengths used for identification and quantification are 181.972nm for sulphate and 285.213nm for magnesium.

DETSC 2084: TOTAL ORGANIC CARBON BY PRIMACS^{ATC} ANALYSER

Soil samples are treated with phosphoric acid to expel any inorganic carbonates. The samples are then heated at high temperature in a continuous flow of air so that any organic carbon is oxidised to carbon dioxide. The gas is then allowed to cool and analysed by an infra-red detector.

DETSC 2085: TOTAL AND DISSOLVED ORGANIC CARBON IN WATER

Direct TOC Analysis. The sample is acidified, stirred and purged to remove the IC before the sample is injected and handled as in the TC Analysis.

TC Analysis

The sample is injected by an automated septum less rotary port into a high temperature reactor. In the reactor, at a temperature of $750 - 950^\circ\text{C}$ all organic and inorganic carbon is oxidized to the gaseous carbon dioxide (CO_2). The catalyst that is present in the reactor catalysis the oxidation to completion. A flow of air transports these oxidation products to the detectors. The oxygen required for reaction is taken from the airflow. The products are led into the non-dispersive infrared detector where the carbon dioxide is determined. The carbon dioxide is measured at a wavelength of $4.2\mu\text{m}$ by NDIR detection.

Auto sampler

Sample pre-treatment for direct TOC determination is fully controlled by the operational software and can be set in preferred mode by the operator. The instrument has a dual needle set-up to acidify and purge the following sample while analysing the current one to save analysis time. Stirring is possible either by top stirrer or magnetic stirrer. An option for making automatic working standards, as well as pre- and post-dilutions is available in the software

DETSO 2119: EXCHANGEABLE AMMONIA IN SOIL

An intense blue-green complex, related to indophenol blue, is formed by the reaction of ammonia with hypochlorite and sodium salicylate, in the presence of sodium nitroprusside acting as a catalyst. The complex is measured spectrophotometrically at wavelength 655nm and is related to the ammonia concentration by means of a calibration curve. Sodium citrate is added to overcome interfering ions.

DETSO 2123: WATER SOLUBLE BORON IN SOIL & BORON IN WATER

Boron in soil is extracted in boiling saline water.

Waters are filtered prior to analysis to remove any particulates in suspension.

The water soluble boron in the extract or filtrate reacts with azomethine-H to produce a yellow coloured complex. The resulting colour absorbance is measured at 420nm using a suitable visible spectrophotometer.

DETSO 2130: CYANIDES & MONOHYDRIC PHENOLS BY SKALAR

Solid samples are extracted with 1M caustic soda prior to analysis on the automated flow analyzer.

The method determines total cyanide, easily liberated cyanide, thiocyanate and monohydric phenols. The automated procedure is based on the following reactions.

DETSO 2207: LOW LEVEL AMMONIA IN WATERS & LEACHATES BY KONELAB 60i

Ammonia reacts with hypochlorite ions generated by the alkaline hydrolysis of sodium dichloroisocyanurate to form monochloramine. Monochloramine reacts with salicylate ions in the presence of sodium nitroprusside at around pH 12.6 to form a blue compound. The absorbance of this compound is measured spectrophotometrically at wavelength 660nm and is related to the ammonia concentration by means of a calibration curve.

The Konelab60i analyses a series of manually prepared standards. These standards are used to produce a calibration graph. Filtered samples are analysed and the Ammonia content determined by plotting the result on the calibration graph.

DETSO 2208: SULPHIDE IN WATERS & LEACHATES BY KONELAB 60i

Sulphide is determined colorimetrically using the Konelab 60i autoanalyser. Potassium Dichromate converts N-N-Diethyl-p-phenylene-diamine to the free radical which reacts rapidly with sulphide to produce the coloured 'DPD Blue' or 'Ethylene Blue'. The absorbance can then be measured at wavelength 660nm.

The Konelab 60i analyses a series of manually prepared standards. These standards are used to produce a calibration graph. Filtered samples are analysed and the Sulphide content determined by plotting the result on the calibration graph.

DETSO 2301: METALS IN SOILS BY ICP-OES

Metals in soil are extracted by microwave or hot-block using a mixture of aqua regia and hydrogen peroxide. Their concentrations are determined by Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES). The wavelengths used for identification and quantification of each metal are given in Table 4.1.

DETSO 2306: METALS IN WATERS BY ICP-MS

Concentrations of metals in water are determined by Inductively Coupled Plasma Mass Spectroscopy (ICP-MS).

DETSO 2325: MERCURY IN SOIL BY ATOMIC FLUORESCENCE SPECTROSCOPY

The mercury is extracted from soil in aqua regia with gentle refluxing. The extract is filtered to remove particulates and diluted to volume. Treatment with tin (II) chloride reduces mercury (II) to mercury (0) vapour which is detected using atomic fluorescence spectrometry.

DETSC 3049: ELEMENTAL SULPHUR IN SOILS AND WATERS BY HPLC

The method is suitable for all soil samples and is validated for the following matrices to the MCERT's Standard for Soils: Sandy soil, loam and clay

The method is UKAS accredited for the following aqueous matrices: Clean water (non regulatory) River water, Groundwater, Trade effluent, prepared and landfill leachates.

DETSC 3072: ALIPHATIC / AROMATIC TPH BY GC-FID

Aliphatic and aromatic petroleum hydrocarbons (C_{10} - C_{35}) are extracted from soil and water using n-Hexane. The fractions are separated by solid phase extraction using silica columns, whereby the aliphatic fraction is eluted first with n-Hexane and the aromatic portion is eluted second with dichloromethane. The total, aliphatic, and aromatic concentrations are determined by gas chromatography flame ionisation detection (GC-FID) using a capillary column and hydrogen as the carrier gas. The chromatographic data is further characterized by subdivision into approximate boiling point/carbon number ranges with respect to n-alkane retention time markers.

DETSC 3301: PAH IN SOIL BY GC-FID

Soils are extracted in dichloromethane (DCM) using sonication. The PAH concentration is recorded both as "Total PAH" and as "Speciated PAH", specified in terms of the 16 US EPA "Priority Pollutant" Polycyclic Aromatic Hydrocarbons. Concentrations are determined by gas chromatography using a BPX 50 (30m; 0.25 μ m ID; 0.25 μ m film) capillary column (or equivalent).

DETSC 3311: EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) IN SOIL, BALLAST AND WATER

This method is designed to determine total concentrations of extractable petroleum hydrocarbons (EPH) in solid and aqueous matrices. This method uses a dichloromethane (DCM) extraction followed by quantification using gas chromatography/flame ionisation detection (GC-FID) analysis using a 1:1 mixture of diesel and mineral oil as calibration standards and n-alkane markers to establish the boiling point ranges. This method is used for the quantitative analysis of "Total EPH" (C_{10} - C_{40}) and as "Speciated EPH", specified in terms of the "diesel range" (C_{10} - C_{24}), and "mineral oil range" (C_{24} - C_{40}).

DETSC 3322 BTEX, MTBE & PRO IN WATERS & LEACHATES BY HEADSPACE GC-FID

BTEX, MTBE and PRO in soils are determined via Headspace GC-FID. Individual aromatic compounds are quantified by external calibration against known standards. PRO range is banded using alkane markers to define retention time windows.

Analytical Quality Control Summary

KEY

Det	Determination code (Test)
Aqc name	Name of Analytical Quality Control (AQC) sample
Target	Target value for AQC from validation or AQC chart review
Target sd	Target standard deviation (sd) used as basis for 2sd (warning) and 3sd (action) limits
Mean	Mean value of data plotted on AQC chart for summary period
Sd	sd value of data plotted on AQC chart for summary period
% Rsd	Precision of results expressed as percent relative standard deviation
Bias	Target value minus Mean value
Max	Maximum AQC value on chart for summary period
Min	Minimum AQC value on chart for summary period
Count	Number of AQC values on chart for summary period

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
B-WS-3iS	AQC 0612 B INO 066	9.6068	0.67293	9.62800	0.789107	8.196	0.0212	11.2300	7.9100	135
Cl-2:1i3S	AQC 0510 INO 021	99.0920	12.15514	106.84181	8.061837	7.546	7.7498	126.3300	91.0100	36
Cl-2:1i3S	AQC 0510 INO 085	100.6936	11.62492	104.60455	6.880844	6.578	3.9110	121.5048	91.8073	30
Cl-2:1i3S	AQC 0510 INO 086	104.0017	11.10522	98.63310	5.884708	5.966	-5.3839	114.9665	91.8069	24
CN-FREE3iS	AQC 0513 INO 087	9.2913	0.63619	9.19540	0.646304	7.029	-0.0959	10.5200	7.4670	119
CN-FREE3iS	AQC 0513 INO 050	9.4077	0.52043	9.38112	0.500546	5.336	-0.0266	10.3500	8.0300	76
CN-TOT3iS	AQC 0513 INO 087	14.1133	0.78518	13.11988	0.693574	5.286	-0.9934	15.0320	11.0330	144
CN-TOT3iS	AQC 0513 INO 050	13.9063	0.87951	13.12986	0.529172	4.030	-0.7764	14.3060	12.0050	81
LOI-1iS	AQC LOI 0613	5.2378	0.22131	5.26937	0.219257	4.161	0.0316	5.8380	4.9300	56
NH4-N3iS	AQC 0613 NH3 INO 066	7.5199	0.52440	7.65475	0.825221	10.781	0.1348	9.4700	5.9500	40
pH-iS	AQC 0513 PH INO 036	8.1322	0.07357	8.13489	0.076553	0.941	0.0027	8.2900	7.9800	47
pH-iS	AQC 0513 PH INO 094	8.1453	0.05475	8.17887	0.054322	0.664	0.0336	8.3200	8.0400	390
SCN-3iS	AQC 0513 INO 087	97.9451	5.19077	100.05760	5.759523	5.756	2.1125	111.5460	87.5650	43
SCN-3iS	AQC 0513 INO 050	100.7359	5.53453	101.69941	5.611231	5.517	0.9635	110.3650	87.4520	32
SO4oe2:1iS	AQC 0613 MET NV	292.7392	22.65028	294.56303	23.422685	7.952	1.8238	356.5130	251.2970	185
SO4oe2:1iS	AQC 0613 MET 006	304.5264	19.53227	276.95983	7.105640	2.566	-27.5666	288.7850	268.5410	6
SO4oe2:1iS	AQC 0114 MET 006	693.6633	41.83930	707.70621	43.390806	6.131	14.0429	815.8660	577.7060	33
SO4oe2:1iS	AQC 0114 MET NV	656.2603	58.57172	702.31545	51.040454	7.267	46.0551	821.3330	564.1990	92
TOC-man1iS	AQC 0109 OM	1.9170	0.05634	1.91658	0.055524	2.897	-0.0004	2.0540	1.8000	206

The above data is the AQC Summary from 2nd December 2013 – 11th February 2014.

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
As-oe3iS	AQC 0910 MET NV	7.6664	0.36568	7.46714	0.372234	4.985	-0.1993	8.6883	6.8983	29
As-oe3iS	AQC 0910 MET 005	7.9034	0.36796	8.02749	0.396871	4.944	0.1241	9.2517	7.0156	279
Cd-oe3iS	AQC 0910 MET NV	12.7516	0.45516	12.54160	0.345974	2.759	-0.2100	13.0172	11.4392	29
Cd-oe3iS	AQC 0910 MET 005	11.8669	0.39572	12.38964	0.559070	4.512	0.5227	13.5544	10.7354	278
Cr-oe3iS	AQC 0910 MET NV	32.7974	1.99786	34.64716	1.954359	5.641	1.8498	38.5609	29.9867	29
Cr-oe3iS	AQC 0910 MET 005	36.4382	1.90980	35.02287	2.224558	6.352	-1.4153	40.7642	28.5990	278
Cu-oe3iS	AQC 0910 MET 005	60.9469	2.26147	59.58753	3.694307	6.200	-1.3594	69.2802	48.8418	279
Cu-oe3iS	AQC 0910 MET NV	57.5251	3.38585	60.07794	2.805437	4.670	2.5528	67.4854	55.4025	29
Hg-ps3iS	AQC HG 0911 MET 014	1.6089	0.10823	1.62182	0.109896	6.776	0.0129	1.9330	1.3680	284
Ni-oe3iS	AQC 0910 MET NV	29.3673	1.48515	29.93996	0.909249	3.037	0.5727	32.1208	28.1288	29
Ni-oe3iS	AQC 0910 MET 005	30.5569	0.88747	29.62940	1.309798	4.421	-0.9275	33.0272	25.6559	278
Pb-oe3iS	AQC 0910 MET NV	33.9494	2.11518	33.77975	2.342167	6.934	-0.1697	38.5694	30.4610	29
Pb-oe3iS	AQC 0910 MET 005	35.8592	1.85598	35.22324	2.011715	5.711	-0.6360	41.0354	29.6238	280
Se-oe3iS	AQC 0910 MET NV	44.7737	2.29912	43.87601	1.871222	4.265	-0.8977	47.7370	39.5915	30
Se-oe3iS	AQC 0910 MET 005	41.7153	1.84282	43.83552	2.571532	5.866	2.1202	49.6807	37.9097	279
Zn-oe3iS	AQC 0910 MET NV	91.4933	3.69153	92.03094	3.587019	3.898	0.5376	102.4480	85.6100	30
Zn-oe3iS	AQC 0910 MET 005	96.3399	3.05920	92.46249	4.635938	5.014	-3.8774	101.4440	79.3443	282

The above data is the AQC Summary from 2nd December 2013 – 11th February 2014.

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
BENZ-3iS	AQC ORG 016	1.7909	0.14119	1.79040	0.135392	7.562	-0.0005	1.9800	1.3600	75
BENZ-3iS	AQC ECOS8083	1.7652	0.11378	1.73102	0.112606	6.505	-0.0342	1.9400	1.4400	155
ETHBEN3iS	AQC ECOS8083	1.7590	0.10778	1.71794	0.108279	6.303	-0.0411	1.9200	1.4700	155
ETHBEN3iS	AQC ORG 016	1.7659	0.13414	1.76547	0.128118	7.257	-0.0004	1.9600	1.4000	75
S-FREE3iS	AQC SULPHUR 0513	127.1881	11.24286	129.23355	15.766993	12.200	2.0455	167.4174	96.0050	52
TOLU3iS	AQC ORG 016	1.7796	0.14256	1.77947	0.136806	7.688	-0.0001	2.0000	1.3400	75
TOLU3iS	AQC ECOS8083	1.7703	0.11278	1.71942	0.111537	6.487	-0.0509	1.9400	1.4800	155
TPH-T3iS	AQC ORG 034	1079.7368	89.28977	1080.48798	93.687840	8.671	0.7512	1285.6760	799.5310	80
TPH-T3iS	AQC ORG 027	1113.8562	111.73050	1127.92101	82.600951	7.323	14.0648	1335.6330	917.5420	92
XYLEN3iS	AQC ECOS8083	5.1730	0.31870	5.09706	0.331176	6.497	-0.0759	5.7400	4.4000	153
XYLEN3iS	AQC ORG 016	5.2674	0.38180	5.24397	0.390010	7.437	-0.0234	5.8500	4.1600	73

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
ANAPT-3iS	AQC ORG 025F 0810	20.8094	1.40593	20.97717	1.329284	6.337	0.1678	22.9460	17.8276	59
ANAPT-3iS	AQC ORG 062B 0114	21.5779	1.66674	22.38075	0.690631	3.086	0.8028	22.8691	21.8924	2
ANAPT-3iS	AQC ORG 032F 0211	21.1532	1.25743	20.36942	1.595880	7.835	-0.7838	23.1842	17.3293	92
ANAPT-3iS	AQC ORG 032M 0211	21.2506	1.20773	20.63378	1.492535	7.233	-0.6168	22.9916	17.2822	88
ANAPT-3iS	AQC ORG 062F 0114	21.2060	1.25202	20.21383	1.571796	7.776	-0.9922	21.8090	18.6665	3
ANAPT-3iS	AQC ORG 025M 0810	20.5027	1.24028	20.19720	1.483933	7.347	-0.3055	21.8518	17.7724	7
ANAPY-3iS	AQC ORG 025M 0810	20.0611	1.31272	20.98767	0.982008	4.679	0.9266	22.4425	19.6917	7
ANAPY-3iS	AQC ORG 062F 0114	21.0963	1.23890	20.38700	1.521387	7.463	-0.7093	21.9290	18.8871	3
ANAPY-3iS	AQC ORG 032M 0211	21.0266	1.26840	20.59884	1.480877	7.189	-0.4278	23.0856	16.9590	88
ANAPY-3iS	AQC ORG 032F 0211	20.7819	1.33583	20.37220	1.543196	7.575	-0.4097	22.8500	17.3910	92
ANAPY-3iS	AQC ORG 062B 0114	21.7903	1.68664	22.57060	0.709794	3.145	0.7803	23.0725	22.0687	2
ANAPY-3iS	AQC ORG 025F 0810	20.4098	1.38768	20.58678	1.502875	7.300	0.1770	23.0752	17.4776	59
ANTHR-3iS	AQC ORG 025M 0810	20.0402	1.39330	20.44703	0.991137	4.847	0.4068	21.8914	18.9873	7
ANTHR-3iS	AQC ORG 062F 0114	20.8402	1.14781	20.42157	2.216968	10.856	-0.4186	22.7960	18.4058	3
ANTHR-3iS	AQC ORG 032M 0211	20.7646	1.30030	20.61447	1.411350	6.846	-0.1501	22.7599	17.6634	88
ANTHR-3iS	AQC ORG 032F 0211	20.9144	1.18730	20.12701	1.476819	7.337	-0.7874	22.6275	17.0872	92
ANTHR-3iS	AQC ORG 062B 0114	22.7872	2.03628	23.79820	0.837922	3.521	1.0110	24.3907	23.2057	2
ANTHR-3iS	AQC ORG 025F 0810	20.6258	1.26488	21.01050	1.223852	5.825	0.3847	23.1396	18.0260	59
BENAA-3iS	AQC ORG 025F 0810	19.7696	1.85331	19.37881	1.926354	9.941	-0.3908	23.0732	15.9041	59
BENAA-3iS	AQC ORG 025M 0810	19.0655	1.63405	19.70519	0.844912	4.288	0.6397	21.0857	18.4902	7
BENAA-3iS	AQC ORG 062F 0114	21.1692	1.13099	20.54810	1.220843	5.941	-0.6211	21.7920	19.3517	3
BENAA-3iS	AQC ORG 032M 0211	19.8833	2.00400	19.78307	1.880898	9.508	-0.1002	23.2899	15.5364	88
BENAA-3iS	AQC ORG 032F 0211	20.3725	1.35013	19.12668	1.632649	8.536	-1.2458	22.2431	16.0156	92

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
BENAA-3iS	AQC ORG 062B 0114	21.4187	1.84535	21.61850	0.623385	2.884	0.1998	22.0593	21.1777	2
FANTH-3iS	AQC ORG 025M 0810	20.3961	1.29120	20.76894	0.594491	2.862	0.3728	21.5611	20.0178	7
FANTH-3iS	AQC ORG 062F 0114	21.3969	1.18752	20.48180	1.772818	8.656	-0.9151	22.3550	18.8302	3
FANTH-3iS	AQC ORG 032M 0211	20.7300	1.59684	20.41259	1.672777	8.195	-0.3174	23.1080	16.0657	88
FANTH-3iS	AQC ORG 025F 0810	20.1706	1.58993	20.79197	1.546471	7.438	0.6214	23.1438	17.0901	59
FANTH-3iS	AQC ORG 062B 0114	21.5995	1.78115	22.22540	0.715168	3.218	0.6259	22.7311	21.7197	2
FANTH-3iS	AQC ORG 032F 0211	21.0625	1.25716	19.77538	1.720374	8.700	-1.2871	22.7303	16.9784	92
FLOUR-3iS	AQC ORG 062F 0114	20.8676	1.22015	19.74517	1.766916	8.949	-1.1224	21.5630	18.0340	3
FLOUR-3iS	AQC ORG 032M 0211	20.1947	1.40633	19.80753	1.537600	7.763	-0.3872	22.3585	16.3338	88
FLOUR-3iS	AQC ORG 032F 0211	20.3206	1.26715	19.56733	1.601936	8.187	-0.7533	22.6497	16.5416	92
FLOUR-3iS	AQC ORG 062B 0114	21.2070	1.70252	22.02225	0.712976	3.238	0.8152	22.5264	21.5181	2
FLOUR-3iS	AQC ORG 025F 0810	19.9818	1.44715	19.99831	1.691555	8.458	0.0165	22.7412	17.0042	59
FLOUR-3iS	AQC ORG 025M 0810	19.6957	1.64405	20.21446	1.256383	6.215	0.5188	22.5823	18.4875	7
NAPH-3iS	AQC ORG 062F 0114	21.1963	1.09501	20.14057	1.055890	5.243	-1.0557	21.1670	19.0575	3
NAPH-3iS	AQC ORG 032M 0211	20.9237	1.16978	20.31901	1.414182	6.960	-0.6047	23.0243	16.6944	88
NAPH-3iS	AQC ORG 032F 0211	20.1839	1.37033	19.72125	1.451770	7.361	-0.4627	22.1962	16.8265	92
NAPH-3iS	AQC ORG 062B 0114	20.9552	1.41482	21.50475	0.576221	2.680	0.5496	21.9122	21.0973	2
NAPH-3iS	AQC ORG 025F 0810	19.8159	1.47304	19.77699	1.466364	7.414	-0.0389	22.7534	17.1704	59
NAPH-3iS	AQC ORG 025M 0810	19.7588	1.53604	20.02577	0.758291	3.787	0.2670	21.0774	18.6870	7
PHENA-3iS	AQC ORG 025F 0810	19.5857	1.87048	19.45559	2.007849	10.320	-0.1301	23.0307	15.0727	59
PHENA-3iS	AQC ORG 025M 0810	19.8303	1.36516	20.60657	1.153693	5.599	0.7763	22.5215	19.3104	7
PHENA-3iS	AQC ORG 062F 0114	21.4644	1.24440	20.84393	1.499385	7.193	-0.6205	22.2950	19.3005	3
PHENA-3iS	AQC ORG 062B 0114	21.5412	1.76945	22.32770	0.717148	3.212	0.7865	22.8348	21.8206	2

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
PHENA-3iS	AQC ORG 032F 0211	20.6190	1.48026	19.51863	1.811948	9.283	-1.1004	22.9209	15.9796	92
PHENA-3iS	AQC ORG 032M 0211	19.8255	1.92158	19.83088	1.975733	9.963	0.0054	22.7489	15.0044	88
PYRE-3iS	AQC ORG 032F 0211	21.0757	1.17115	19.64333	1.689667	8.602	-1.4324	22.9241	16.9278	92
PYRE-3iS	AQC ORG 062B 0114	20.3756	1.65594	20.93745	0.656973	3.138	0.5618	21.4020	20.4729	2
PYRE-3iS	AQC ORG 025F 0810	20.4820	1.52747	20.64222	1.475392	7.147	0.1602	23.5082	17.1552	59
PYRE-3iS	AQC ORG 032M 0211	20.6878	1.48189	20.22306	1.578177	7.804	-0.4647	23.0474	16.0621	88
PYRE-3iS	AQC ORG 062F 0114	20.8862	1.08326	19.99420	1.705958	8.532	-0.8920	21.8140	18.4312	3
PYRE-3iS	AQC ORG 025M 0810	20.6192	1.23339	20.71576	0.819150	3.954	0.0966	22.1545	20.0018	7

The above data is the AQC Summary from 2nd December 2013 – 11th February 2014.

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
BAPYR-3iS	AQC ORG 025F 0810	19.8051	1.76246	20.31016	1.530013	7.533	0.5051	23.2827	16.5458	59
BAPYR-3iS	AQC ORG 062B 0114	20.7504	1.59558	21.03130	0.530896	2.524	0.2809	21.4067	20.6559	2
BAPYR-3iS	AQC ORG 032F 0211	19.8658	1.55791	19.12943	1.651731	8.635	-0.7364	22.3617	15.5971	92
BAPYR-3iS	AQC ORG 032M 0211	20.2886	1.56248	20.20885	1.672615	8.277	-0.0798	22.7538	16.6803	88
BAPYR-3iS	AQC ORG 062F 0114	20.6251	1.02386	20.46953	0.699093	3.415	-0.1556	21.0690	19.7016	3
BAPYR-3iS	AQC ORG 025M 0810	20.0495	1.48286	20.72863	1.112743	5.368	0.6791	22.2672	19.5107	7
BENBF-3iS	AQC ORG 025M 0810	19.6969	1.84029	19.78140	1.591955	8.048	0.0845	22.1744	17.9648	7
BENBF-3iS	AQC ORG 062F 0114	20.5854	0.99492	20.36737	0.593251	2.913	-0.2180	21.0445	19.9390	3
BENBF-3iS	AQC ORG 032M 0211	19.4946	1.94267	19.46059	1.858711	9.551	-0.0340	22.8342	15.9386	88
BENBF-3iS	AQC ORG 032F 0211	20.2083	1.69436	18.94190	1.841985	9.724	-1.2664	23.0051	15.4914	92
BENBF-3iS	AQC ORG 062B 0114	19.7499	1.52723	19.97235	0.471852	2.363	0.2224	20.3060	19.6387	2
BENBF-3iS	AQC ORG 025F 0810	19.5603	1.96539	19.07961	1.977193	10.363	-0.4807	22.1257	14.3588	59
BKFLO-3iS	AQC ORG 025M 0810	20.4014	1.38176	20.68616	1.580422	7.640	0.2848	22.7748	18.0247	7
BKFLO-3iS	AQC ORG 062F 0114	20.2283	0.78239	19.92407	0.846874	4.251	-0.3042	20.7200	19.0341	3
BKFLO-3iS	AQC ORG 032M 0211	21.0529	1.34676	20.76023	1.522339	7.333	-0.2927	23.0657	17.3470	88
BKFLO-3iS	AQC ORG 032F 0211	20.0738	1.45815	19.28481	1.703019	8.831	-0.7890	22.9096	16.3594	92
BKFLO-3iS	AQC ORG 062B 0114	21.2037	1.64128	21.30215	0.546523	2.566	0.0984	21.6886	20.9157	2
BKFLO-3iS	AQC ORG 025F 0810	20.8249	1.66828	21.43495	1.395208	6.509	0.6101	23.7368	17.5267	59
BPERY-3iS	AQC ORG 025F 0810	19.8279	1.63697	20.37031	1.402942	6.887	0.5424	22.8282	16.7823	59
BPERY-3iS	AQC ORG 025M 0810	20.2610	1.40392	20.28170	1.408209	6.943	0.0207	22.4850	18.4056	7
BPERY-3iS	AQC ORG 062F 0114	20.3757	0.73962	20.42407	0.340134	1.665	0.0484	20.7389	20.0633	3
BPERY-3iS	AQC ORG 062B 0114	20.1822	1.48848	20.30160	0.476731	2.348	0.1194	20.6387	19.9645	2
BPERY-3iS	AQC ORG 032F 0211	20.0455	1.37444	19.39128	1.543567	7.960	-0.6542	22.7310	16.7575	92

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
BPERY-3iS	AQC ORG 032M 0211	20.5642	1.45039	20.50618	1.485762	7.245	-0.0580	23.5659	17.3386	88
CHRY5-3iS	AQC ORG 032M 0211	20.4669	1.47276	20.27454	1.682421	8.298	-0.1924	22.9645	15.9490	88
CHRY5-3iS	AQC ORG 062F 0114	20.8600	0.89060	20.63533	1.095658	5.310	-0.2247	21.7170	19.5262	3
CHRY5-3iS	AQC ORG 025M 0810	20.0222	1.49112	20.64813	1.185197	5.740	0.6259	22.2959	19.2258	7
CHRY5-3iS	AQC ORG 032F 0211	20.1699	1.31287	19.28142	1.576670	8.177	-0.8885	22.3114	16.4566	92
CHRY5-3iS	AQC ORG 062B 0114	21.2519	1.69486	21.62215	0.591353	2.735	0.3702	22.0403	21.2040	2
CHRY5-3iS	AQC ORG 025F 0810	20.1832	1.59665	20.59530	1.494407	7.256	0.4121	22.8465	17.2919	59
DIBEN-3iS	AQC ORG 025M 0810	20.1382	1.63579	20.20747	1.491551	7.381	0.0693	22.5946	18.5256	7
DIBEN-3iS	AQC ORG 062F 0114	20.5447	0.84561	20.76087	0.449499	2.165	0.2162	21.0487	20.2429	3
DIBEN-3iS	AQC ORG 032M 0211	20.7344	1.66991	20.62121	1.641759	7.962	-0.1132	23.2098	15.4430	88
DIBEN-3iS	AQC ORG 032F 0211	19.1496	1.49404	19.01003	1.456611	7.662	-0.1396	22.2411	16.0917	92
DIBEN-3iS	AQC ORG 062B 0114	20.5466	1.52053	20.63945	0.505369	2.449	0.0928	20.9968	20.2821	2
DIBEN-3iS	AQC ORG 025F 0810	20.3688	1.59188	20.73085	1.428022	6.888	0.3620	23.1240	17.2338	59
INDE-3iS	AQC ORG 062B 0114	20.5535	1.41443	20.55440	0.457922	2.228	0.0009	20.8782	20.2306	2
INDE-3iS	AQC ORG 032F 0211	20.3621	1.71187	19.45562	1.740017	8.944	-0.9065	23.2362	16.3325	92
INDE-3iS	AQC ORG 032M 0211	19.9902	1.96732	20.40376	1.823176	8.935	0.4136	23.1223	16.1004	88
INDE-3iS	AQC ORG 062F 0114	20.6784	0.75547	20.87247	0.354371	1.698	0.1941	21.1933	20.4921	3
INDE-3iS	AQC ORG 025M 0810	19.3680	1.68294	20.18754	1.548639	7.671	0.8195	22.3357	18.6618	7
INDE-3iS	AQC ORG 025F 0810	19.6499	2.01593	19.64800	2.057521	10.472	-0.0019	23.0225	14.5474	59
PAH-3iS	AQC ORG 025M 0810	320.7619	15.40243	318.99275	24.350065	7.633	-1.7691	347.6348	268.6147	8
PAH-3iS	AQC ORG 062F 0114	334.0524	14.23418	326.23040	17.627972	5.404	-7.8220	343.3600	308.1431	3
PAH-3iS	AQC ORG 032M 0211	327.8786	19.52922	324.45858	22.782545	7.022	-3.4200	359.8817	278.1349	88
PAH-3iS	AQC ORG 032F 0211	326.2814	14.56591	312.71570	21.319719	6.818	-13.5657	352.2371	276.6247	92

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
PAH-3iS	AQC ORG 062B 0114	337.4908	25.80922	344.80900	9.821006	2.848	7.3182	351.7535	337.8645	2
PAH-3iS	AQC ORG 025F 0810	323.8939	20.00574	324.78753	21.358263	6.576	0.8936	363.8142	278.9905	59

The above data is the AQC Summary from 2nd December 2013 – 11th February 2014.

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
ANTHR-4iL	AQC ANTHR-L	57.8643	3.38105	57.61451	3.699034	6.420	-0.2498	65.6329	49.7386	78
As-msS4iL	AQC ICPMS 0712	4.3046	0.24086	4.25177	0.299922	7.054	-0.0528	4.9059	3.4803	219
BENZ-4iL	AQC ORG 051	105.2233	8.78100	104.47500	6.631950	6.348	-0.7483	114.1800	99.2200	4
BENZ-4iL	AQC ORG 016	99.6642	7.72069	101.62309	7.477063	7.358	1.9589	118.8600	82.7000	55
BPERY-4iL	AQC BENZO-GHI-L	60.9425	5.32769	60.72197	5.026386	8.278	-0.2205	70.9404	47.2859	78
Cd-msS4iL	AQC ICPMS 0712	2.1356	0.12796	2.13235	0.128100	6.007	-0.0033	2.4363	1.7983	224
CHRY-S-4iL	AQC CHRY-S-L	61.5430	3.85593	61.20750	3.429353	5.603	-0.3355	68.1827	50.2390	78
Cl-an3iL	AQC 8192	5.0286	0.22599	5.28109	0.267047	5.057	0.2525	5.8775	4.5627	82
Cl-an3iL	AQC INO 021	5.1065	0.30754	5.06071	0.352271	6.961	-0.0458	5.9600	4.2400	42
Cl-an3iL	AQC 8193	5.2330	0.23926	5.28276	0.242747	4.595	0.0498	5.8677	4.6170	135
CN-FREE4iL	AQC FREECN SKALAR2-L	492.2330	31.45565	466.08493	15.119114	3.244	-26.1481	493.6500	445.5800	14
CN-FREE4iL	AQC FREE CN-L	489.3230	19.08834	476.77463	17.725540	3.718	-12.5484	515.4700	436.9300	89
CN-TOT4iL	AQC TOTAL CYANIDE-L	522.6868	19.42369	494.21245	21.632317	4.377	-28.4743	549.6100	449.9000	99
CN-TOT4iL	AQC TOT CN SKALAR2-L	503.9980	26.30497	487.66627	18.880971	3.872	-16.3317	531.7900	464.8660	15
COND-iL	AQC EC 12.91	12.8955	0.01245	12.89218	0.012121	0.094	-0.0033	12.9200	12.8700	206
COND-iL	AQC EC 1413	1411.2642	1.68561	1411.58937	1.637095	0.116	0.3252	1414.0000	1407.0000	207
COND-iL	AQC EC 147	147.4677	1.06429	147.33043	1.084843	0.736	-0.1373	149.1000	144.9000	207
Cr-msS4iL	AQC ICPMS 0712	20.4101	1.01402	20.35549	1.133105	5.567	-0.0546	22.9470	17.4320	226
Cu-msS4iL	AQC ICPMS 0712	20.0938	1.08473	19.32867	1.160852	6.006	-0.7651	21.8510	16.5400	225
ETHBEN-4iL	AQC ORG 051	104.9933	7.93539	106.02750	6.106048	5.759	1.0342	113.7900	99.0200	4
ETHBEN-4iL	AQC ORG 016	101.7409	7.60253	101.19236	7.336566	7.250	-0.5485	118.3300	84.4100	55
Fe-msS4iL	AQC ICPMS 0712	383.2431	24.92675	382.51206	23.232028	6.074	-0.7310	449.0900	324.2500	160
Hg-msS4iL	AQC ICPMS 0712	0.1193	0.01054	0.11977	0.010846	9.056	0.0005	0.1443	0.0898	208

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
NH4N-k3iL	AQC KONE NH3 HIGH L	30.6200	0.69647	31.05846	0.711950	2.292	0.4385	32.0689	28.9000	18
NH4N-k3iL	AQC NH3 LOW INO 098	1.5651	0.03501	1.56906	0.029910	1.906	0.0040	1.6399	1.5077	69
NH4N-k3iL	AQC NH3 HIGH INO 098	30.7362	0.97165	30.69577	0.999064	3.255	-0.0404	32.8830	28.7400	84
NH4N-k3iL	AQC KONE NH3 LOW L	1.5464	0.07076	1.52537	0.101080	6.627	-0.0210	1.7035	1.3593	20
Ni-msS4iL	AQC ICPMS 0712	20.3334	1.06221	19.98288	1.261336	6.312	-0.3505	23.5380	16.6700	225
PAH-4iL	AQC PAH-L	924.2935	60.54595	915.00757	61.239701	6.693	-9.2859	1011.2201	777.6477	46
Pb-msS4iL	AQC ICPMS 0712	20.3292	1.28331	19.82231	1.287273	6.494	-0.5069	22.7240	16.9860	232
pH-iL	AQC PH-L 0409 MANUAL	7.9923	0.01457	7.99447	0.015046	0.188	0.0022	8.0400	7.9500	255
pH-iL	AQC PH-L 0409 ROBOT	8.0096	0.05046	0.00000			-8.0096	7.9500	7.9500	1
S-FREE4iL	AQC SULPHUR-L 0510	1078.2843	125.95434	988.79964	139.899981	14.148	-89.4847	1218.7678	727.2326	19
S2-kl4iL	AQC S2 INO 098	242.3294	10.65647	245.00408	12.107510	4.942	2.6747	265.9300	231.7700	10
S2-kl4iL	AQC KONE S2 LIQUID	236.3240	11.48327	232.72727	10.213727	4.389	-3.5967	255.4600	209.5600	44
SCN-4iL	AQC THIOCN-L	2401.7200	104.90834	2391.64154	110.366948	4.615	-10.0785	2573.4800	2224.1200	26
SCN-4iL	AQC THIOCN SKALAR2-L	2473.5998	170.06111	2470.37380	116.642507	4.722	-3.2260	2589.3650	2304.8880	5
Se-msS4iL	AQC ICPMS 0712	4.3006	0.31177	3.98705	0.300064	7.526	-0.3135	4.6800	3.1796	206
SO4-an3iL	AQC INO 021	5.0884	0.20930	5.24178	0.276375	5.273	0.1534	5.7100	4.5700	45
SO4-an3iL	AQC 8192	5.1187	0.19956	5.27275	0.236188	4.479	0.1540	6.0859	4.6962	93
SO4-an3iL	AQC 8193	5.1308	0.25097	5.13318	0.274232	5.342	0.0024	6.1258	4.4264	138
SS-SUS-3iL	AQC SUSPENDED SOLIDS	196.5752	3.20583	195.93962	2.826206	1.442	-0.6356	204.5000	191.0000	53
TOC-man3iL	AQC TOC-L HIGH RANGE	98.7750	1.19173	98.76200	1.361105	1.378	-0.0130	101.0000	96.0000	50
TOC-man3iL	AQC TOC-L	10.0090	0.29747	9.95791	0.299350	3.006	-0.0511	10.5000	9.4200	67
TOLU-4iL	AQC ORG 051	105.0767	7.96986	108.09750	8.655027	8.007	3.0208	116.1100	98.3000	4
TOLU-4iL	AQC ORG 016	100.3183	7.80097	101.17127	7.599992	7.512	0.8530	118.0800	84.3900	55

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Det	Aqc name	Target	Target sd	Mean	Sd	% Rsd	Bias	Max	Min	Count
TPH-T4iL	AQC ORG 027	100.2546	6.85912	104.97053	7.867952	7.495	4.7159	117.3840	91.3030	19
TPH-T4iL	AQC ORG 034	99.7784	5.67145	101.35522	5.557938	5.484	1.5768	109.4660	90.2940	27
Zn-msS4iL	AQC ICPMS 0712	20.3726	1.37242	22.31502	1.734529	7.773	1.9424	27.2600	17.8020	247

The above data is the AQC Summary from 2nd December 2013 – 11th February 2014.

Appendix L
Site Diaries

	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
18-11-13/ 0730	Wrexham Maelor Gas Works	Environmental Supervision	18-11-13/ 1630
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/ Rotary Site Investigations/ Aurora Radiation Specialists/ Burrell Plant Hire/ Ecology Consultants (TBC)	Dry, Cloudy and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site
0800	Site Induction with IH Brown
0900	Meeting with Wales and West Utilities for explanation of works
1030	Meeting with Flogas for explanation of works
1100	Ecological Habitat Survey Walkover
1300	Lunch
1600	Ecological Habitat Survey Walkover Complete
1630	Leave Site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	18/11/13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
19-11-13 /0730	Wrexham Maelor Gas Works	Environmental Supervision	19-11-13 /1630
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Cloudy and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Walkover Site with James Wood (JW) of IH Brown looking at access to all areas of the site for intrusive works.
1030	Ring DETS labs to arrange delivery of containers and collections of samples
1100	Call Dave Cooke (DAC) to discuss works including BH depths, numbers in area B and types of covers for BHs.
1200	Lunch
1300	Site walkover to locate and monitor existing boreholes
1500	Walkover Site with James Wood (JW) of IH Brown looking at access to all areas of the site for intrusive works looking at service constraints
1630	Leave site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	19-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
20-11-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	20-11-13/ 1100
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire/L and M service clearance	Wet, Cloudy and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Get service clearance for all BHs and TPs in area A and C with L and M service clearance
1100	Drive to IKM in Grangemouth

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	20-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
25-11-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	25-11-13/1630
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Sunny and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Mobilise Terrier Rig to BH3
0900	Ring G2o to check diameter of stand pipe required for pump and treat system.
0930	Start Trial Pits (TPs) in area C looking for spent oxide.
1000	TP 15, 16 and TP17
1200	Lunch
1300	TP 18 and 19
1500	Go and Log BH1
1530	Clear TP locations and access for tomorrow with JW
1600	Call and Update DAC
1630	Leave Site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	25-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
26-11-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	26-11-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Grey and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Mobilise and supervise drilling of BH2
1000	TP10,11,12
1300	Lunch
1400	Call and Update DAC
1400	Service strike of water main during digging of TP21 whilst on phone to DAC and TP being supervised by IH Brown. TP abandoned. Move onto TP 18, 19 20
1630	Call and Update Liz Copland of IKM then sort samples for next day collection and new ones for tomorrow
1730	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	26-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
27-11-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	27-11-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Cloudy and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Choose and clear locations in the eastern area of area B for window sampling and show drillers locations. BHs 8,9,12,13,10,11,14,15,16 Drilled.
1000	Call Lab for more soil containers
1030	TP7,10
1300	Lunch
1330	Ring and update DAC
1400	TP 9,8
1530	BHs 8,9,12,13,10,11,14,15,16 sampled
1630	Sort samples for collection and next day
1800	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	27-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
28-11-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	28-11-13/1700
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Dull and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Walk and choose and clear locations for BHs 17-21 for drillers in western area of area B. BHs 17-21 drilled.
1000	Ring and arrange collections and more containers from the Lab.
1030	TP8A,TP5
1300	Lunch
1400	TP6 and TP4
1530	Sample BHs 17-21
1630	Sort samples for collection and new ones for tomorrow
1700	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	28-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
29-11-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	29-11-13/1400
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Damp and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	TP3 (spacers found), TP2 and TP23.
1300	Sample BH4
1400	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	29-11-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
02-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	02-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Cloudy and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Clear for services and dig TP 24,26,25,22,27,28
1300	Lunch
1400	Clear for services and dig TP31 and 32 in Bedwell Brook area in area C.
1600	Drillers complete BH6 and BH7 to 7mbgl.
1615	Call DAC for update
1730	MS sorts samples for collection and new containers for next day

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	02-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
03-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	03-12-13/1700
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/ Rotary Site Investigations/Aurora Radiation Specialists/ Burrell Plant Hire	Overcast and Cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	TP 33,34,35,36
1300	Call DAC for update
1400	TP37,38,39,40.41
1630	Sort samples for collection and containers for next day
1630	Drillers complete BH8
1700	Marks off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	03-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
04-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	04-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Rain Showers with sunny spells and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	TP42-46
1300	Lunch
1400	Neil calls about petrol pump for purge
1415	TP47 and HP48, TP49-51 looking for spent oxide in area C
1700	Sort samples for collection and containers for the next day
1730	Call DAC for update
1800	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	04-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
05-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	05-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Rain Showers with sunny spells windy	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	HBR on site and sample TP6, TP7, TP52, Drilling of BH4
1300	Lunch
1415	Drilling of BH4
1700	Sort samples for collection and containers for the next day
1730	Call DAC for update
1800	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	05-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
06-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	06-12-13/1000
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire/HBR	Rain Showers and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Drilling of WS22
1000	Mark off site Drive to Scotland

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	06-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
09-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	09-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Rotary Site Investigations/Aurora Radiation Specialists/Burrell Plant Hire	Sunny spells and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Drilling WS23 and Soil Sampling
0800	Sediment and Water Sampling
1300	Lunch
1400	Drilling WS24 and Soil Sampling, Sediment and Water Sampling
1700	Sort samples for collection and containers for the next day
1730	Call DAC for update
1800	Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	09-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
10-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	10-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/GEO2 /Aurora Radiation Specialists	Rain Showers with sunny spells and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	GEO2 on site for pump test
0800	Sediment and Water Sampling
1300	Lunch
1400	Sediment and Water Sampling
1700	Sort samples for collection and containers for the next day
1730	Call DAC for update
1800	GEO2 and IHB and Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	10-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
11-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	11-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/Aurora Radiation Specialists	Rain Showers with sunny spells and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Sediment and Water Sampling
1100	Aurora Leave Site
1300	Lunch
1400	Sediment and Water Sampling
1700	Sort samples for collection and containers for the next day
1730	Call DAC for update
1800	IHB and Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	11-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
12-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	12-12-13/1800
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown	Cloudy and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Sediment and Water Sampling
1100	Aurora Leave Site
1300	Lunch
1400	Sediment and Water Sampling
1700	Sort samples for collection and containers for the next day
1730	Call DAC for update
1800	IHB and Mark off site

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	12-12-13
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	ENVIRONMENTAL DAILY DIARY	Document Number: ENV-012
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PROJECT NO:	13627	PROJECT TITLE:	Wrexham Mitigation Site Investigation
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START DATE/TIME	SITE	PURPOSE OF SITE VISIT	FINISH DATE/TIME
13-12-13/0730	Wrexham Maelor Gas Works	Environmental Supervision	13-12-13/1300
IKM STAFF	THIRD PARTY STAFF/COMPANY	WEATHER	
Mark Sweeney	I&H Brown/ Rotary Site Investigations/Aurora Radiation Specialists/ Burrell Plant Hire	Rain Showers with sunny spells and cold.	

TIME	COMMENT
0700	Leave Hotel
0730	On site and IH Brown Tool Box Talk.
0800	Sediment and Water Sampling
1300	Mark off site. Leave site for Scotland

ADDITIONAL ITEMS	ACTION

DIARY COMPLETED BY:	Mark Sweeney	DATE:	13-12-13
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Appendix M
Controlled Waste Certificates

creating a better place



Ms Jan Edwards
Alan's Skip Hire Ltd
Unit 5
Oasis Business Park
Road One,
Winsford Industrial Estate,
Winsford,
Cheshire,
CW7 3RY

Our ref: CBDa

Your ref:

Reg. Customer I.D. No: a300110054

Date: 09/08/2012

Dear Ms Edwards

**The Waste (England and Wales) Regulations 2011
Registration approved
Application for registration as an Upper Tier Carrier Broker Dealer of controlled waste**

Registration Number:- CB/RN5719WL

Further to your recent application we have registered you/renewed your registration as an Upper Tier Carrier Broker Dealer of controlled waste. Your registration lasts for three years and the expiry date appears on your certificate.

It is your responsibility to ensure you renew your registration before the expiry date if you wish to remain registered. We will send you a reminder by post (or e-mail if we have your e-mail address) about one month before your registration is due to expire.

You can see your registration details on your certificate – if any of this information changes you must inform us within 28 days of the change. If you do not we may remove you from the register.

Your certificate of registration is enclosed. Copy certificates are available as plastic cards and cost £5 each. You can order these by completing the enclosed order form and returning it to us along with the appropriate payment. Please make cheques payable to the **Environment Agency**.

Your certificate and copy cards are important documents; please look after them.

If you cease to be registered for any reason or if an amended certificate is issued in the future you must return the original to us.

The Environment Agency does not endorse any business. You cannot use our logo on your website or promotional literature or say that we specifically recommend or approve you. However you can state that you are registered by the Environment Agency, if this is the case, and have a link to our website <http://www.environment-agency.gov.uk>.

If you have any queries about your registration please contact:-
Environment Agency, National Customer Contact Centre, 99 Parkway Avenue, Parkway Business Park, Sheffield, S9 4WF
Customer Services Line: 03708 506 506
Fax: 01142 626 697
Email: NCCC-carrierbroker@environment-agency.gov.uk





Environment
Agency

CERTIFICATE OF REGISTRATION UNDER
THE WASTE (ENGLAND AND WALES) REGULATIONS 2011

Regulation Authority

Name: Environment Agency
Address National Customer Contact Centre
99 Parkway Avenue
Sheffield
S9 4WF
Tel: 03708 506 506 Fax: 0114 2626697

The Environment Agency certify that the following information is entered in the register which they maintain under regulation 28 of the Waste (England and Wales) Regulations 2011:-

Name(s) of registered carrier: Alan's Skip Hire Ltd
Registered as an: Upper Tier Carrier Broker Dealer
Registration number: CB/RN5719WL
Business name (if any):
Address of principal place of business: Bretton Transfer Station,
Bretton,
Flintshire,
CH4 0BY,
Wales
Tel: 01244 663 500 Fax:
Date of registration: 19/08/2012
Date of expiry of registration (unless revoked): 18/08/2015

Signature of authorised officer
of the regulation authority:

Date: 09/08/2012



238327



Alan's Skip Hire Ltd
Broughton Mills Road
Bretton
Flintshire
CH4 0BY

Tel: 0800 195 4707
Fax: 0870 706 0306
Email: enquiries@alansskips.co.uk
Company Reg No: 4829675
VAT No: 817 7436 09

SKIP CONTAINER DELIVERY/COLLECTION NOTE

DATE 13/12/2013 TIME

TICKET NO.

2959

ORDER NO.

CUSTOMER/PRODUCER OF WASTE
I&H BROWN LTD

SITE ADDRESS

WALLS AND WEST UTILITES
FLOW GAS
MAELOR WORKS
WREXHAM
II13 0uw

CONTACT NO. 07917410236

NOTES/INSTRUCTION

EMAIL

SKIP 08YD LIDDED

WASTE TYPE General Waste
(please tick)

INERT SOIL/BRICK/CLAY ETC

COMMERCIAL/INDUSTRIAL

HOUSEHOLD

SCRAP

GENERAL WASTE

SERVICE TYPE Collection

SKIP POSITION PERMIT/CONES/LIGHTS

On customers property No

VEHICLE REG NO. CX07LBV

DROP DRIVER Carl Seago

LIFT DRIVER Gareth Somerford

SIC CODE EWC CODE

43.11 20 03 01

PAYMENT DETAILS

Account Invoice 45399

I am aware of and accept the conditions as stated overleaf on behalf of the waste producer. I confirm that I have fulfilled my duty to apply to the waste hierarchy as required by Regulation 12 of the waste (England and Wales) Regulation 2011.

All waste disposed of in this container will be pre-treated through our own Materials Recycling Facility to reduce its volume.

SIGNED

PRINT

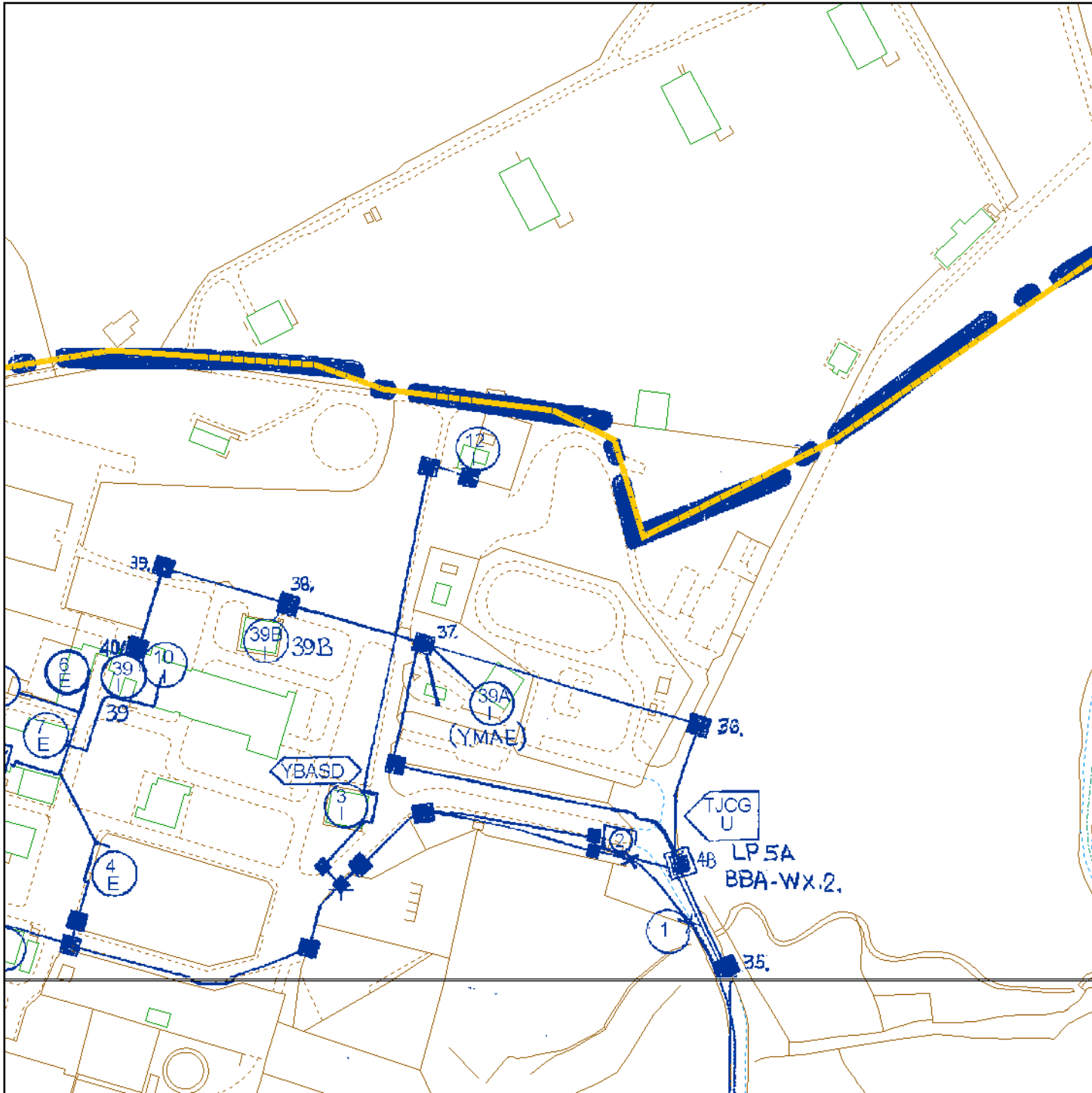
DATE

Waste Carriers Licence No. NOW/270013CB

[Signature]
J. Wood
13/12/13

Appendix N
Wrexham Service Plans

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy.

It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

DIAL BEFORE YOU DIG

FOR PROFESSIONAL ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS

ADVANCE NOTICE REQUIRED
(Office hours: Monday-Friday 08.00 to 17.00)

Tel: 0800 9173993
E-mail: dbyd@openreach.co.uk
Website: www.dialbeforeyoudig.com

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KEY TO BT SYMBOLS

	UNDERGROUND PLANT		POLE
	OVERHEAD PLANT		CABINET
	JOINT BOX		BURIED JOINT
	DISTRIBUTION POINT		JOINTING POST
	MANHOLE		PROPOSED U/G
	DP BOUNDARY		PROPOSED O/H
	OTHER BT BOUNDARY		PROPOSED BOX

Other proposed plant is shown using dashed lines. BT symbols not listed above may be disregarded. Existing BT plant may not be recorded. Information valid at the time of preparation.

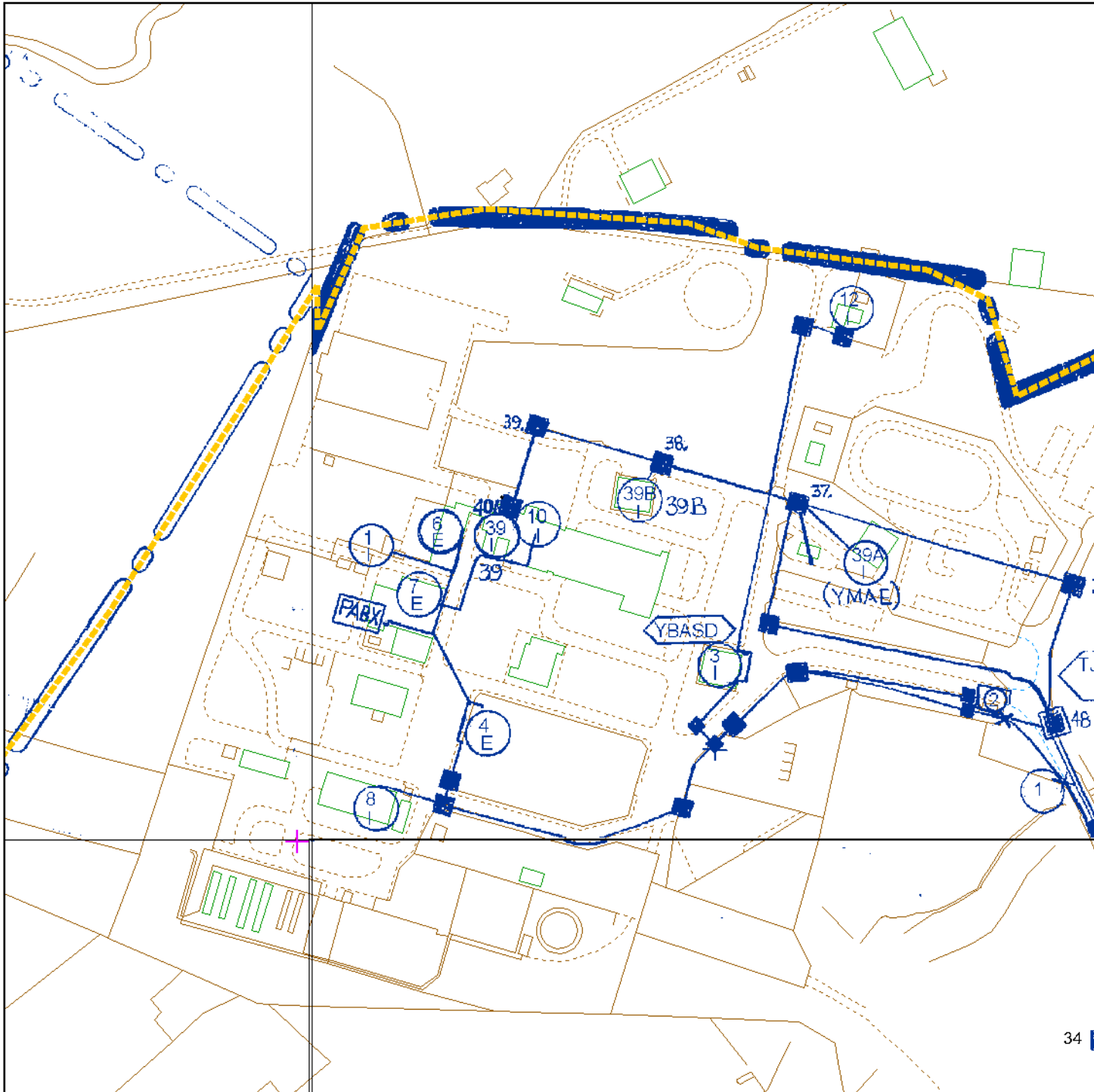
openreach
a BT Group business

BT ref: WIH11360V

Map reference (centre): SJ3828048198

Issued: 15/03/11 11:46:49

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy.

It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

DIAL BEFORE YOU DIG

FOR PROFESSIONAL ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS

ADVANCE NOTICE REQUIRED
(Office hours: Monday-Friday 08.00 to 17.00)

Tel: 0800 9173993
E-mail: dbyd@openreach.co.uk
Website: www.dialbeforeyoudig.com

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KEY TO BT SYMBOLS

	UNDERGROUND PLANT		POLE
	OVERHEAD PLANT		CABINET
	JOINT BOX		BURIED JOINT
	DISTRIBUTION POINT		JOINTING POST
	MANHOLE		PROPOSED U/G
	DP BOUNDARY		PROPOSED O/H
	OTHER BT BOUNDARY		PROPOSED BOX

Other proposed plant is shown using dashed lines. BT symbols not listed above may be disregarded. Existing BT plant may not be recorded. Information valid at the time of preparation.

openreach
a BT Group business

BT ref: GMY11200R

Map reference (centre): SJ3810948133

Issued: 15/03/11 11:30:34

Search Results

Thank you for your enquiry: LS-110315-TV-769-POU

Subject always to our standard terms and conditions, this enquiry result is valid for 28 days only from the date of enquiry and is based on the confirmed information you entered. If the location of the work changes then a further enquiry must be made. Should the work not be undertaken within 28 days of the enquiry then a further enquiry must be made.

ENQUIRER DETAILS

Name: Miss Paula Loasby

Company: WorleyParsons Komex

Email: paula.loasby@worleyparsons.com

Tel: 0117 925 1304

ENQUIRY DETAILS

Your reference: 50065-29

Your location: LL13 0UW

Confirmed location: OS grid reference (338083 348073)

Estimated start date: 1st April 2011

Planned works: Yes

Emergency: No

Type of work: Development Projects -

Commercial/Industrial

Distance covered: 250 metres

IN THE ZONE OF INTEREST

Operator: **National Grid Gas (National Transmission System)**

Further information will be required to confirm the exact location and nature of the proposed works.

IN AN EMERGENCY CONTACT: GAS 0800 111 999 ELECTRICITY 0800 40 40 90

The following list outlines what we need from you:

- Site contact name and number
- Location plan
- Detailed plan (minimum scale 1:2500)
- Cross sectional drawings (if available)
- Work Specification

Please either email the requested additional information and Linesearch reference to plantprotection@uk.ngrid.com or print this page and post to the following address(es):

National Grid Gas (National Transmission System)

Plant Protection

Block 1: Floor 2

Brick Kiln Street

Hinckley

Leicestershire

LE10 0NA

NOT IN THE ZONE OF INTEREST

BOC Limited (A Member of the Linde Group)	Ineos Enterprises Limited
BP Exploration Purbeck Southampton Pipeline	Mainline Pipelines Limited
BPA	Manchester Jetline Limited
Centrica Energy	Marchwood Power Ltd (Gas Pipeline)
ConocoPhillips (UK) Ltd	NPower CHP Pipelines
ConocoPhillips Ltd Humber Refinery	Oikos Storage Limited
Coryton Energy Co Ltd (Gas Pipeline)	Premier Transmission Ltd (SNIP)
E-on UK Plc (Gas Pipelines Only)	SABIC UK Petrochemicals
Esso Petroleum Company Limited	Scottish Power Generation
FibreSpeed Limited	Shell UK Ltd
Geo Networks Limited	Star Energy
Government Pipelines & Storage System	Total UK (Finaline, Colnbrook & Colwick Pipelines)
INEOS Manufacturing (Scotland and TSEP)	Wingas Storage UK Ltd

Thank you for your enquiry, you must now contact the affected operator(s) listed above 'IN THE ZONE OF INTEREST'

Please note

The Linesearch.org system only contains information on National Grid's Transmission assets. All other National Grid or other local high pressure (above 7 bar) gas pipelines and lower pressure gas mains are not included.

For all other energy network operators' information and contact details see <http://2010.energynetworks.org/>

Please quote the Linesearch enquiry reference number in *all* correspondence

Please print this screen for your records.

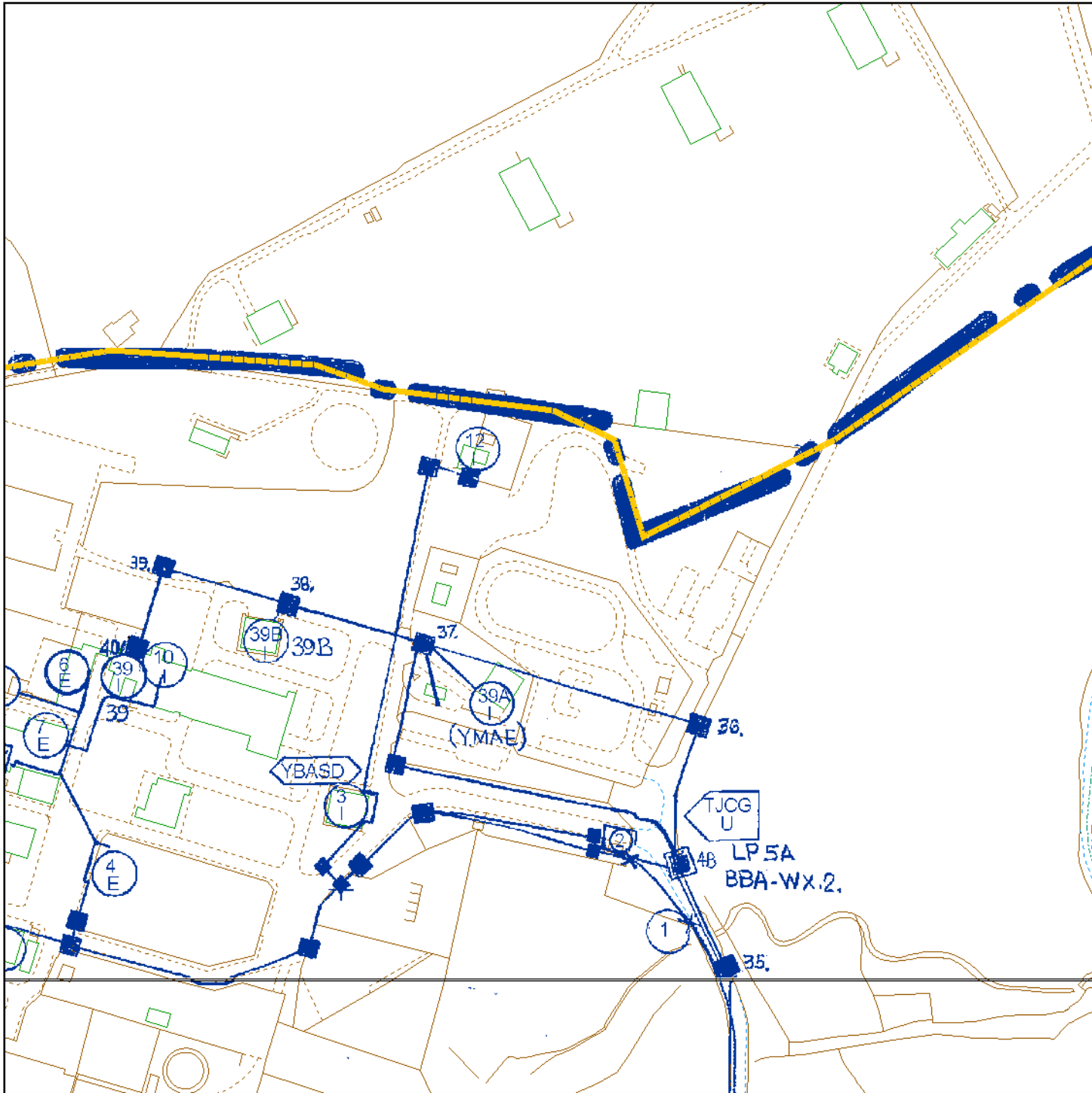
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System by [eShopworks](#)



ID: 7348	View extent: 723m, 393m	Do not proceed without further consultation	Map 1 of 1
USER: wayne.ridgeway	LP MAINS	This plan shows those pipes owned by National Grid Gas plc in its role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc., are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by National Grid Gas plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.	MAPS Plot Server Version 1.7.2
DATE: 04/04/2011	MP MAINS		
DATA DATE: 04/04/2011	IP MAINS		
REF: LS-110315-TV-769-POU - wr022	LHP MAINS		
MAP REF: SJ3848	NHP MAINS		Requested by: Worley Parsons Komex
CENTRE: 338083, 348073	0m 50m Approximate scale 1:2500 on A4 Colour Landscape		This plan is reproduced from or based on the OS map by National Grid Gas plc, with the sanction of the controller of HM Stationery Office. Crown Copyright Reserved. Ordnance Survey Licence number 100024886
Valve	Depth of Cover	Syphon	
Diameter Change	Material Change		

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy.

It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

DIAL BEFORE YOU DIG

FOR PROFESSIONAL ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS

ADVANCE NOTICE REQUIRED
(Office hours: Monday-Friday 08.00 to 17.00)

Tel: 0800 9173993
E-mail: dbyd@openreach.co.uk
Website: www.dialbeforeyoudig.com

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KEY TO BT SYMBOLS

	UNDERGROUND PLANT		POLE
	OVERHEAD PLANT		CABINET
	JOINT BOX		BURIED JOINT
	DISTRIBUTION POINT		JOINTING POST
	MANHOLE		PROPOSED U/G
	DP BOUNDARY		PROPOSED O/H
	OTHER BT BOUNDARY		PROPOSED BOX

Other proposed plant is shown using dashed lines. BT symbols not listed above may be disregarded. Existing BT plant may not be recorded. Information valid at the time of preparation.

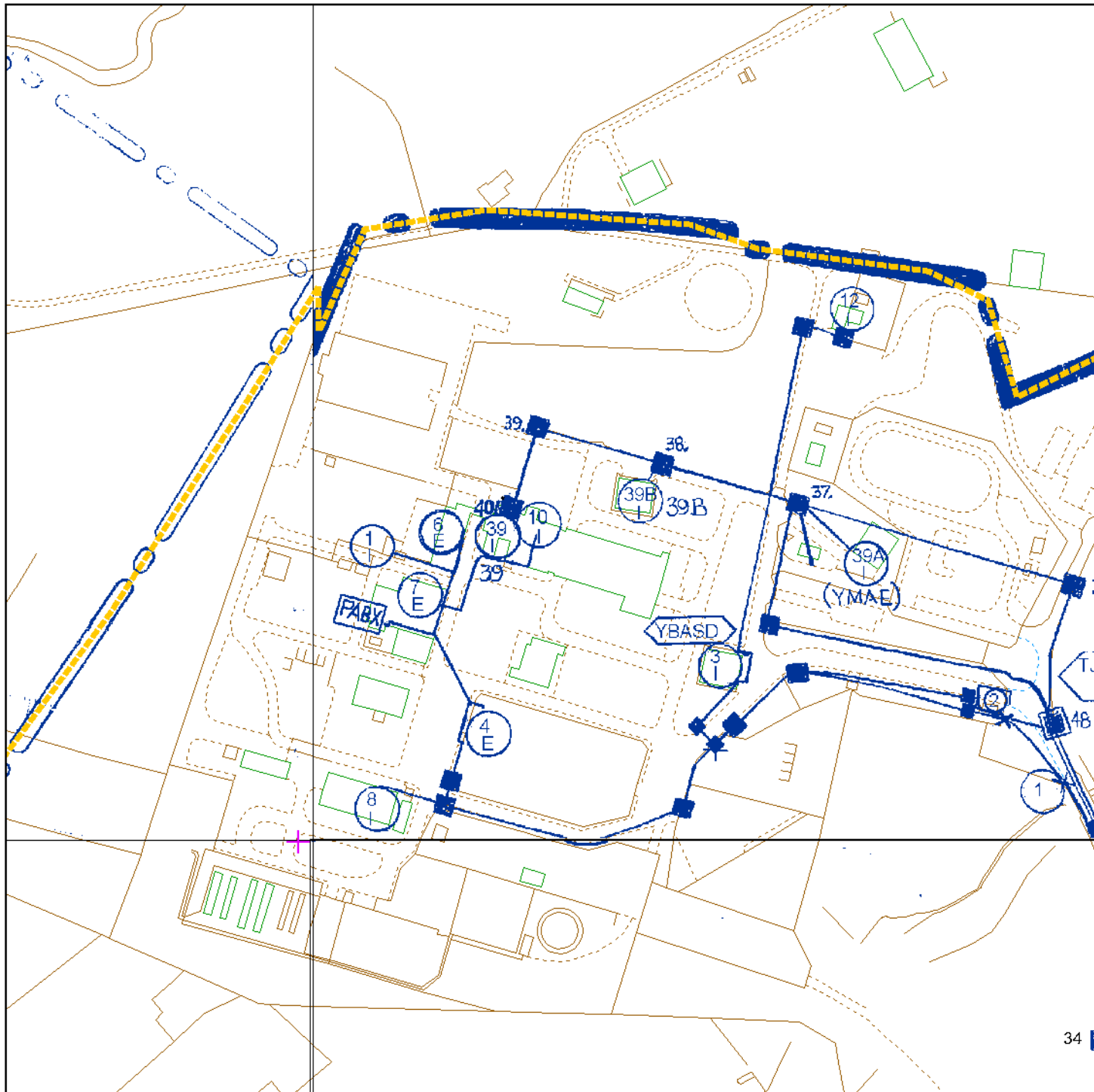
openreach
a BT Group business

BT ref: WIH11360V

Map reference (centre): SJ3828048198

Issued: 15/03/11 11:46:49

Maps by email Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy.

It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

DIAL BEFORE YOU DIG

FOR PROFESSIONAL ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS

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(Office hours: Monday-Friday 08.00 to 17.00)

Tel: 0800 9173993
E-mail: dbyd@openreach.co.uk
Website: www.dialbeforeyoudig.com

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KEY TO BT SYMBOLS

	UNDERGROUND PLANT		POLE
	OVERHEAD PLANT		CABINET
	JOINT BOX		BURIED JOINT
	DISTRIBUTION POINT		JOINTING POST
	MANHOLE		PROPOSED U/G
	DP BOUNDARY		PROPOSED O/H
	OTHER BT BOUNDARY		PROPOSED BOX

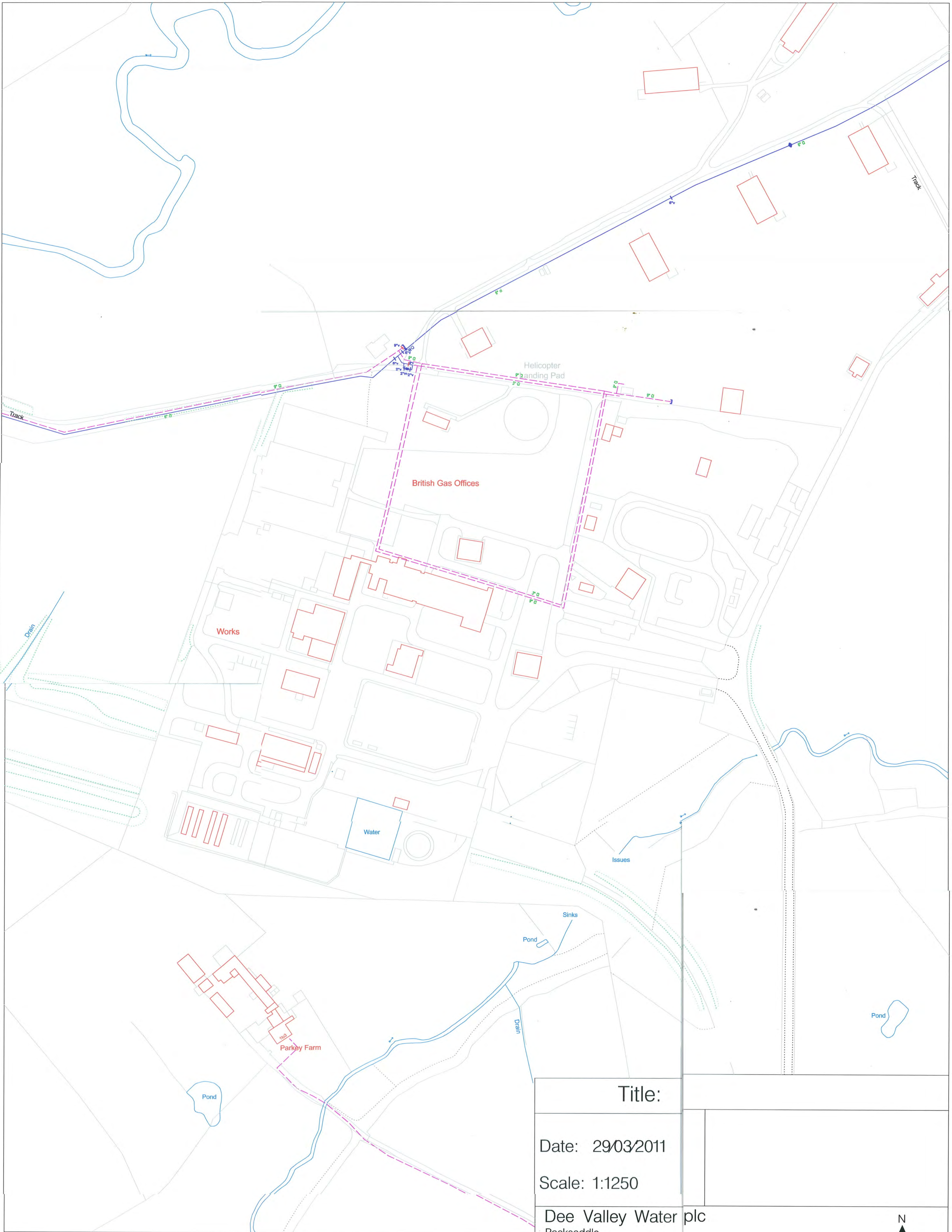
Other proposed plant is shown using dashed lines. BT symbols not listed above may be disregarded. Existing BT plant may not be recorded. Information valid at the time of preparation.

openreach
a BT Group business

BT ref: GMY11200R

Map reference (centre): SJ3810948133

Issued: 15/03/11 11:30:34



DEE VALLEY WATER MAINS ——— PRIVATE WATER MAINS - - - - -

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PLEASE NOTE – THE INFORMATION GIVEN HERE ON THE ROUTES AND LOCATIONS OF MAINS IS INDICATIVE ONLY AND NO WARRANTY IS GIVEN OR IMPLIED
MORE PRECISE INFORMATION CAN BE GIVEN BY PRIOR ARRANGEMENT ALTHOUGH THE DEPTH OF ANY APPARATUS MAY NOT BE ASCERTAINABLE

DO NOT SCALE FROM THIS PRINT

Title:

Date: 29/03/2011

Scale: 1:1250

Dee Valley Water plc
Packsaddle
Wrexham Road
Rhostyllen
Wrexham LL14 4EH





The position and depths of underground and overhead apparatus as indicated on this plan are approximate and are intended for guidance only. The depths may have changed if the land surface levels have altered. You are also informed that the plan may not show, or may inaccurately show, individual property services and services to street lighting installations. The onus of locating the apparatus precisely before commencing any excavations or other works in the immediate vicinity therefore rests entirely upon the person undertaking or responsible for those works. Before any such works are undertaken the precise location of the apparatus and cables should therefore be ascertained by suitable means. In the event of an emergency or for further assistance please contact 0845 272 7979 (ScottishPower area) or 0845 272 2424 (SP Manweb area). Reproduced from (or based upon) Ordnance Survey maps by PowerSystems with the permission of Ordnance Survey on behalf of the controller of HMSO. (c) Crown Copyright Power Systems 100019036.

**SP ENERGY NETWORKS**
On behalf of SP Manweb plc

SP Manweb plc
Registered Office: c/o PowerSystems
3 Prenton Way, Prenton, CH43 3ET
Registered in England and Wales No 2366937

OVERHEAD LINE
In Use: ———
Out of Use: - - - - -
Assumed route: <— — —>

VOLTAGE COLOUR KEY
EHV: 132kV BLUE
33kV GREEN
HV: RED
LV: BROWN

Where cables have been laid SINCE 1 OCTOBER 1988, the following depths in mm apply (to the tops of cables or ducts) UNLESS OTHERWISE SHOWN, but see comments. (TO TOP OF CABLE, ADD 75mm FOR BOTTOM OF TRENCH)

	EHV	HV	LV
IN FOOTPATHS :	775	600	450
ACROSS ROADS :	775	700	600
ALONG ROADS :	775	700	600
AGRICULTURAL :	910	910	910

Your attention is drawn to the Health and Safety Executive Booklet HSG47, available from HSE.

DATE: 06/04/2011

SCALE: 1:5000

MAP REFERENCE: 338109 348015

0 25 50 100 150 200 Metres

Search Results

Thank you for your enquiry: LS-110315-TV-769-POU

Subject always to our standard terms and conditions, this enquiry result is valid for 28 days only from the date of enquiry and is based on the confirmed information you entered. If the location of the work changes then a further enquiry must be made. Should the work not be undertaken within 28 days of the enquiry then a further enquiry must be made.

ENQUIRER DETAILS

Name: Miss Paula Loasby

Company: WorleyParsons Komex

Email: paula.loasby@worleyparsons.com

Tel: 0117 925 1304

ENQUIRY DETAILS

Your reference: 50065-29

Your location: LL13 0UW

Confirmed location: OS grid reference (338083 348073)

Estimated start date: 1st April 2011

Planned works: Yes

Emergency: No

Type of work: Development Projects -

Commercial/Industrial

Distance covered: 250 metres

IN THE ZONE OF INTEREST

Operator: **National Grid Gas (National Transmission System)**

Further information will be required to confirm the exact location and nature of the proposed works.

IN AN EMERGENCY CONTACT: GAS 0800 111 999 ELECTRICITY 0800 40 40 90

The following list outlines what we need from you:

- Site contact name and number
- Location plan
- Detailed plan (minimum scale 1:2500)
- Cross sectional drawings (if available)
- Work Specification

Please either email the requested additional information and Linesearch reference to plantprotection@uk.ngrid.com or print this page and post to the following address(es):

National Grid Gas (National Transmission System)

Plant Protection

Block 1: Floor 2

Brick Kiln Street

Hinckley

Leicestershire

LE10 0NA

NOT IN THE ZONE OF INTEREST

BOC Limited (A Member of the Linde Group)	Ineos Enterprises Limited
BP Exploration Purbeck Southampton Pipeline	Mainline Pipelines Limited
BPA	Manchester Jetline Limited
Centrica Energy	Marchwood Power Ltd (Gas Pipeline)
ConocoPhillips (UK) Ltd	NPower CHP Pipelines
ConocoPhillips Ltd Humber Refinery	Oikos Storage Limited
Coryton Energy Co Ltd (Gas Pipeline)	Premier Transmission Ltd (SNIP)
E-on UK Plc (Gas Pipelines Only)	SABIC UK Petrochemicals
Esso Petroleum Company Limited	Scottish Power Generation
FibreSpeed Limited	Shell UK Ltd
Geo Networks Limited	Star Energy
Government Pipelines & Storage System	Total UK (Finaline, Colnbrook & Colwick Pipelines)
INEOS Manufacturing (Scotland and TSEP)	Wingas Storage UK Ltd

Thank you for your enquiry, you must now contact the affected operator(s) listed above 'IN THE ZONE OF INTEREST'

Please note

The Linesearch.org system only contains information on National Grid's Transmission assets. All other National Grid or other local high pressure (above 7 bar) gas pipelines and lower pressure gas mains are not included.

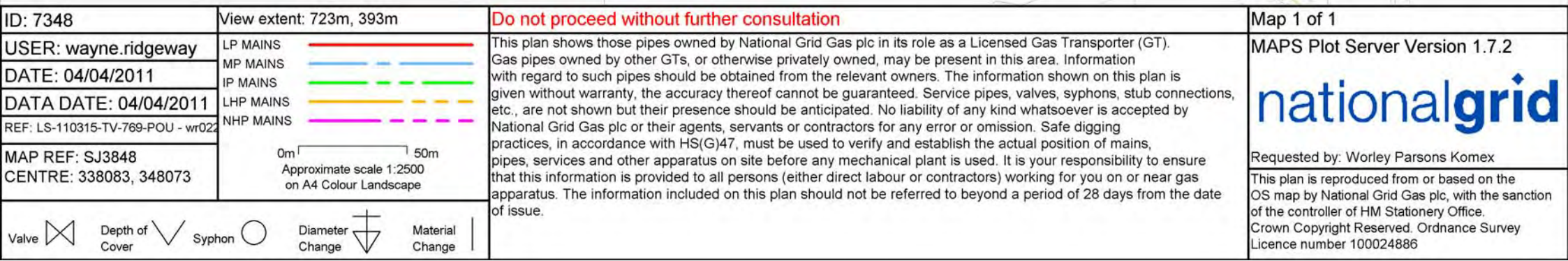
For all other energy network operators' information and contact details see <http://2010.energynetworks.org/>

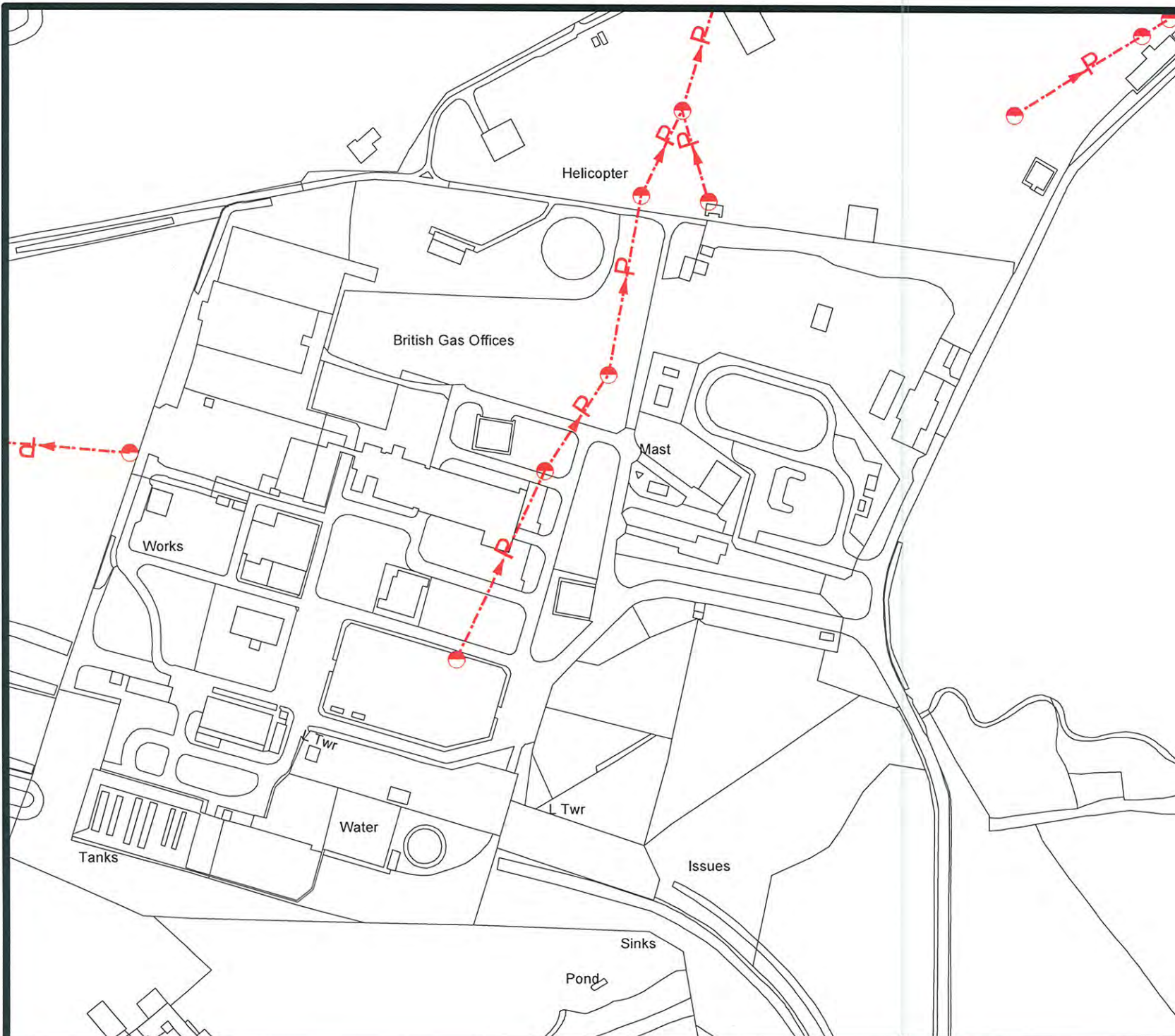
Please quote the Linesearch enquiry reference number in *all* correspondence

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Dŵr Cymru
Welsh Water

365758



LEGEND

Waste network:

- | | | | |
|--|-------------------------|--|---|
| | Foul chamber | | Outfall |
| | Surface water chamber | | Lamp hole |
| | Combined chamber | | Storm Overflow |
| | Combined sewer overflow | | Rising main |
| | Special purpose chamber | | Gravity sewer |
| | Treatment works | | Private sewer |
| | Pumping station | | Private sewer subject to Sect. 104 adoption agreement |

N.B. Sewer symbol colour indicates the type:

- | | |
|--------|--|
| RED | Combined |
| GREEN | Surface water |
| BROWN | Foul |
| Purple | Former S21 sewers (for industrial purposes only) |

Notes:

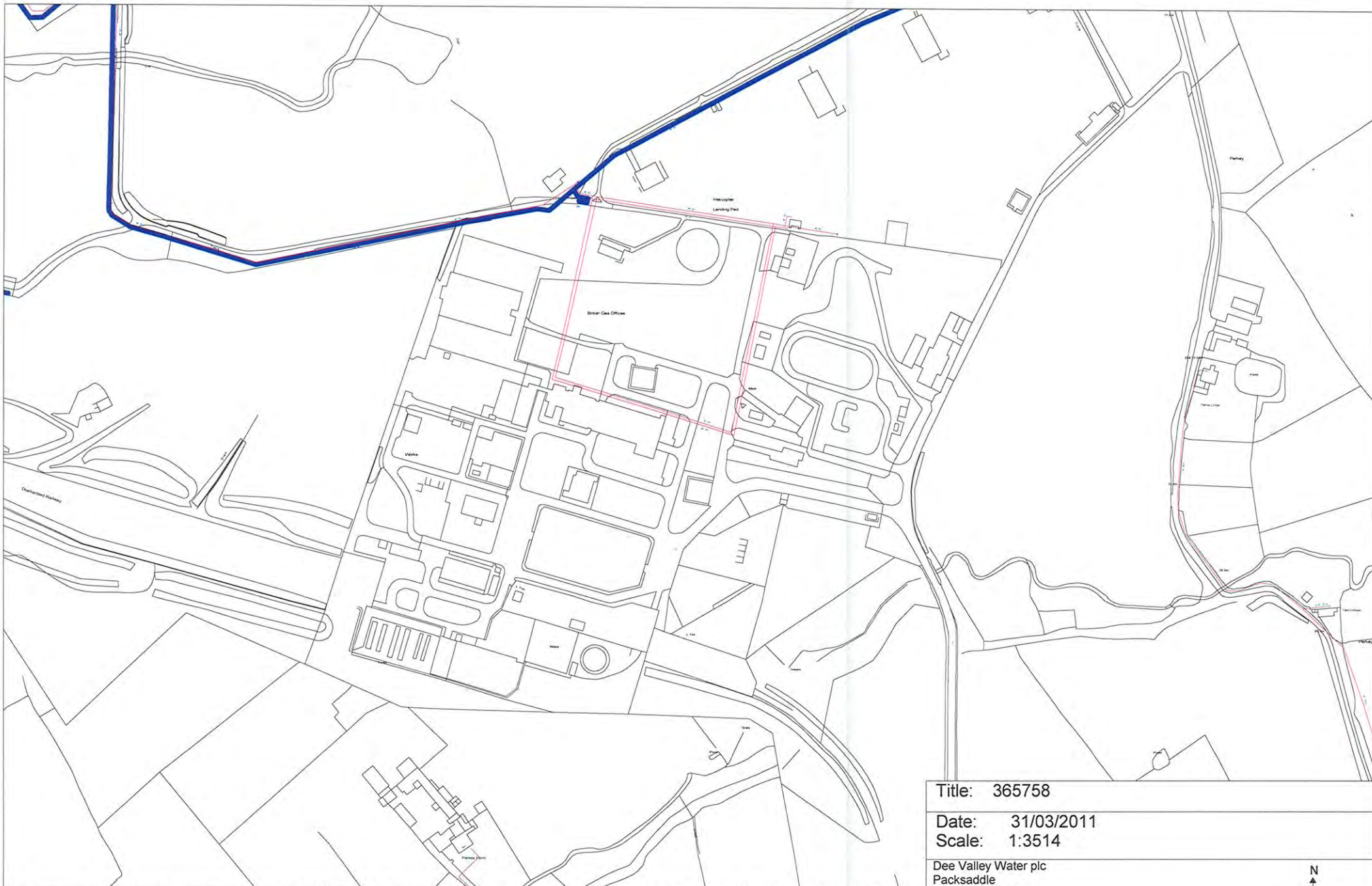
Dŵr Cymru Cyl gives this information as to the position of its underground apparatus by way of general guidance only on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the Company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. It must be understood that the furnishing of the information is entirely without prejudice to the provisions of the New Roads and Streetworks Act 1991 and of the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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Map Ref: 337869 348224
Map scale: 1:2,500
Printed by: MC
Printed on: 31/3/11



Title: 365758

Date: 31/03/2011

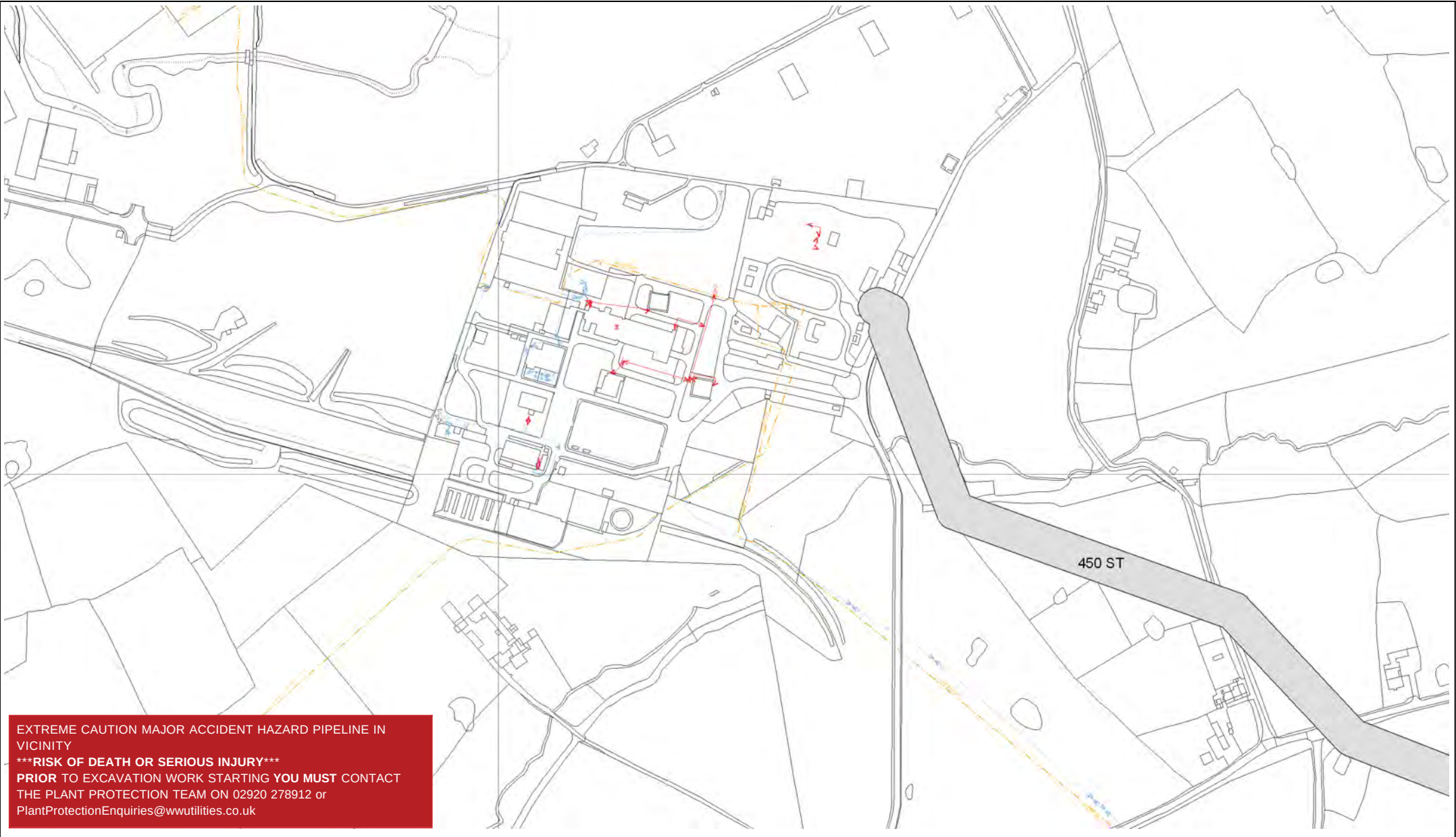
Scale: 1:3514

Dee Valley Water plc
Packsaddle
Wrexham Road
Rhostyllen
Wrexham LL14 4EH
Crown Copyright Dee Valley Water Licence No 100019550

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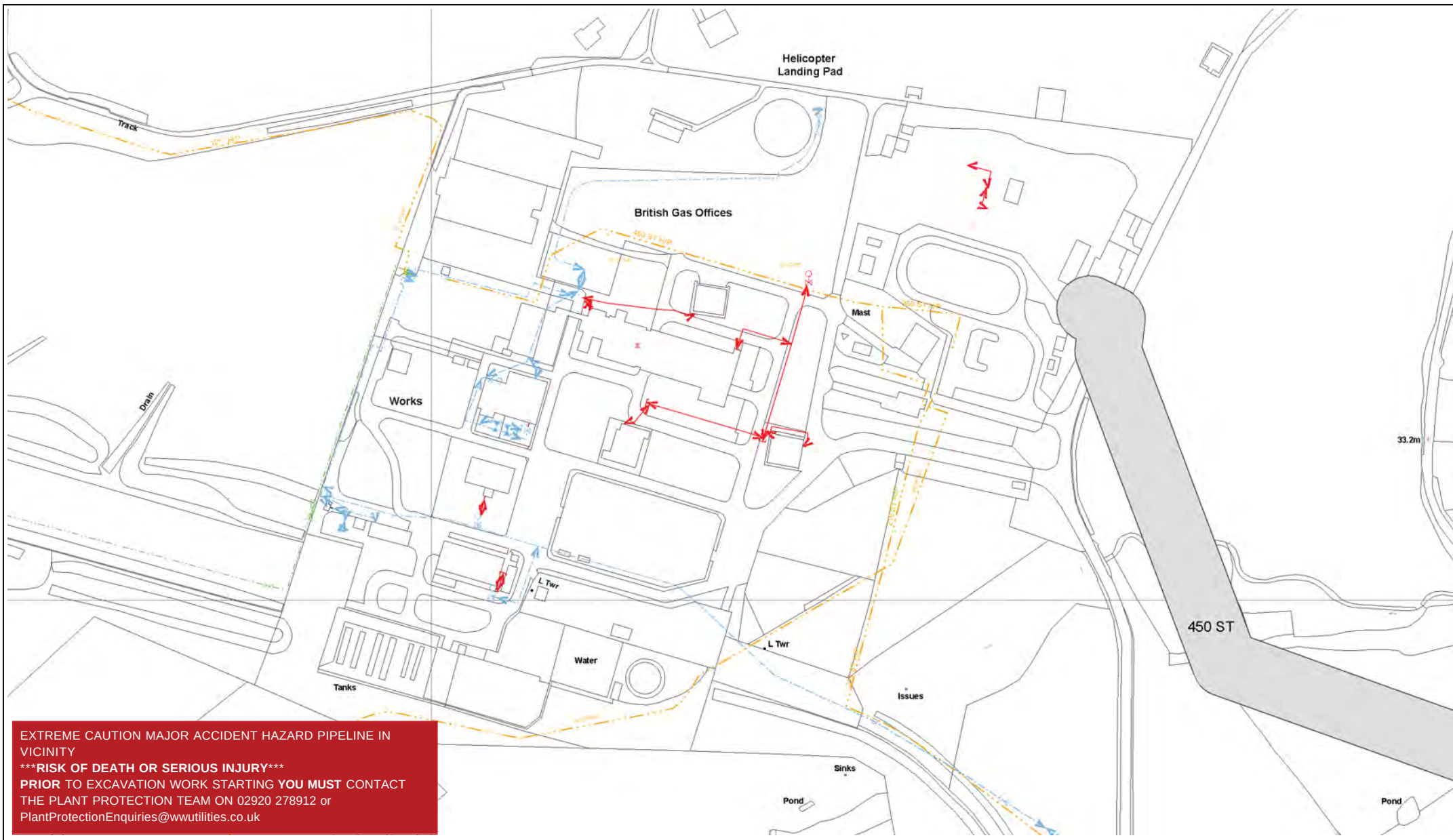
**PLEASE NOTE - The information given here on the routes and locations of mains is indicative only and no warranty is given or implied
More precise information can be given by prior arrangement although the depth of any apparatus may not be ascertainable**

DO NOT SCALE FROM THIS PRINT



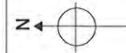
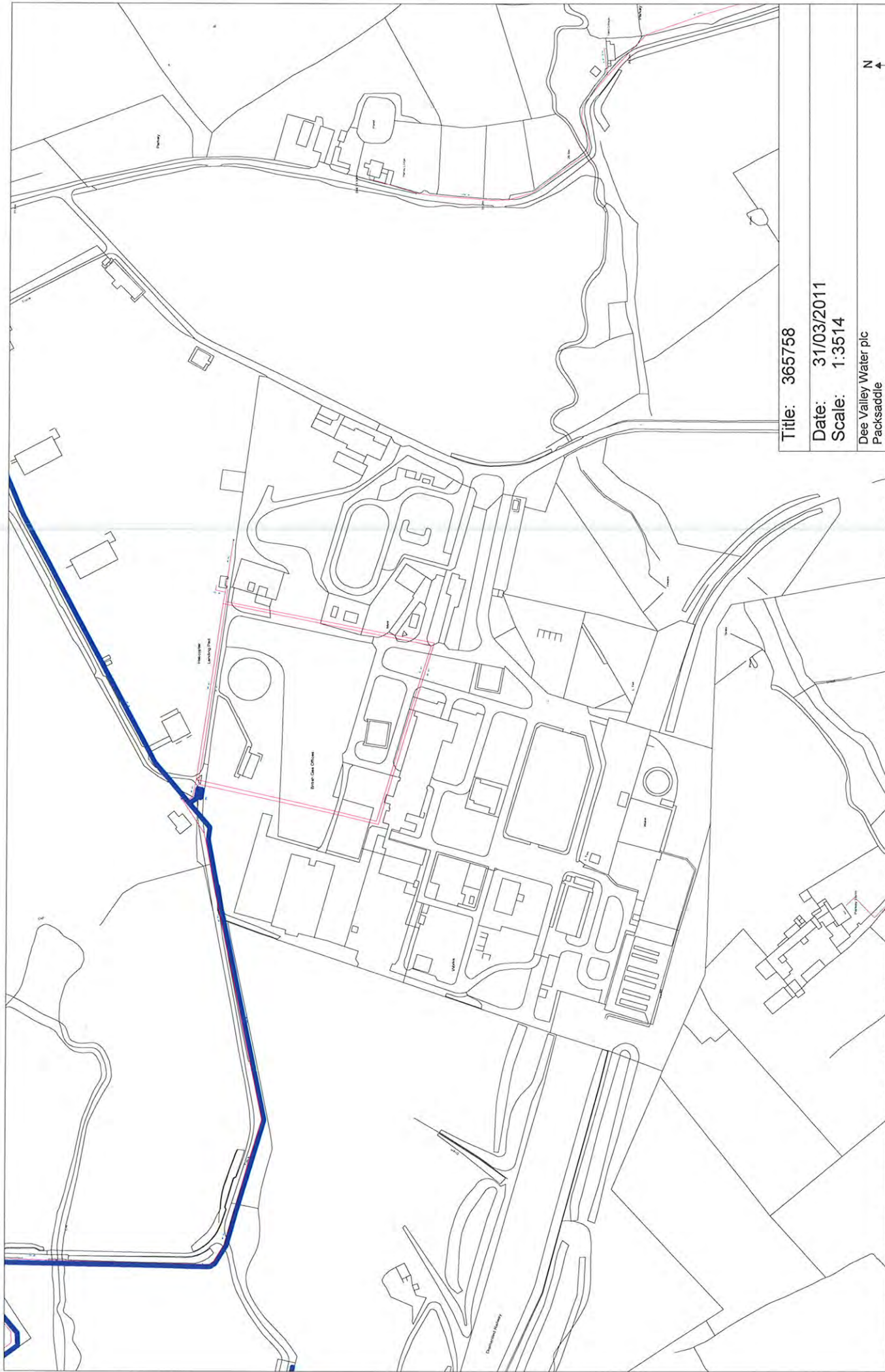
EXTREME CAUTION MAJOR ACCIDENT HAZARD PIPELINE IN VICINITY
RISK OF DEATH OR SERIOUS INJURY
PRIOR TO EXCAVATION WORK STARTING YOU MUST CONTACT
THE PLANT PROTECTION TEAM ON 02920 278912 or
PlantProtectionEnquiries@wwutilities.co.uk

Scale	1:4695	Low Pressure Medium Pressure Intermediate Pressure High Pressure Design Pipes Abandoned N			Title	Maelor Wide	 WALES & WEST UTILITIES Wales & West Utilities Ltd., Wales & West House, Spooner Close, Celtic Springs, Coedkernew, Newport, NP10 8FZ.
User ID	wwutilitiesWorleyParscpahcvq	The plan shows those pipes owned by Wales & West Utilities (WWU) in its role as a Licensed Gas Transporter (GT). The information shown on this plan is derived from historic information and may have involved re-scaling plans, and the accuracy of it cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. may not be shown but their presence should be anticipated. No warranties are therefore given in respect of it. WWU its employees and contractors do not accept any liability for any inaccuracy or incompleteness in it.					
Date	15/03/2011	You must use safe digging practices, in accordance with HS(G)47, to establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you or near gas apparatus. The information shown on this plan should not be used beyond 28 days from the date of issue of this plan as it is subject to updating.					
Grid Ref:	Easting 338210 Northing 348052	Some examples of Plant Items: Valve Depth of Cover Syphon Diameter Change Material Change The plan also provides indications of gas pipes owned by other GTs, or otherwise privately owned, which may be present in this area. This information is not information of WWU and WWU is unable to verify this information or to confirm whether it is accurate or complete. It is supplied voluntarily to assist the user in determining whether to make contact with other GTs or others. The user must obtain such information from the other GT or person concerned. WWU, its employees and contractors do not accept any liability for this information or any inaccuracy or incompleteness in it.					
Printed via WWU UtilityView					Reproduced by permission of Ordnance Survey on behalf of HMSO. Crown copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 0100044308.		



Scale	1:2711	Low Pressure Medium Pressure Intermediate Pressure High Pressure Design Pipes Abandoned N			Title	Maelor Works	WALES&WEST UTILITIES Wales & West Utilities Ltd., Wales & West House, Spooner Close, Celtic Springs, Coedkernew, Newport, NP10 8FZ. Reproduced by permission of Ordnance Survey on behalf of HMSO. Crown copyright and database right 2009. All rights reserved. Ordnance Survey Licence number 0100044308.
User ID	wwutilities\WorleyParscpahcvq				The plan shows those pipes owned by Wales & West Utilities (WU) in its role as a Licensed Gas Transporter (GT). The information shown on this plan is derived from historic information and may have involved re-scaling plans, and the accuracy of it cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. may not be shown but their presence should be anticipated. No warranties are therefore given in respect of it. WU its employees and contractors do not accept any liability for any inaccuracy or incompleteness in it.		
Date	15/03/2011				You must use safe digging practices, in accordance with HS(G)47, to establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you or near gas apparatus. The information shown on this plan should not be used beyond 28 days from the date of issue of this plan as it is subject to updating.		
Grid Ref:	Easting 338160	Some examples of Plant Items:			The plan also provides indications of gas pipes owned by other GTs, or otherwise privately owned, which may be present in this area. This information is not information of WU and WU is unable to verify this information or to confirm whether it is accurate or complete. It is supplied voluntarily to assist the user in determining whether to make contact with other GTs or others. The user must obtain such information from the other GT or person concerned. WU, its employees and contractors do not accept any liability for this information or any inaccuracy or incompleteness in it.		
	Northing 348094	Valve Depth of Cover Syphon Diameter Change Material Change					
Printed via WWU UtilityView							

Map Ref: 337869 348224
Map scale: 1:2,500
Printed by: MC
Printed on: 31/3/11



Title: 365758

Date: 31/03/2011

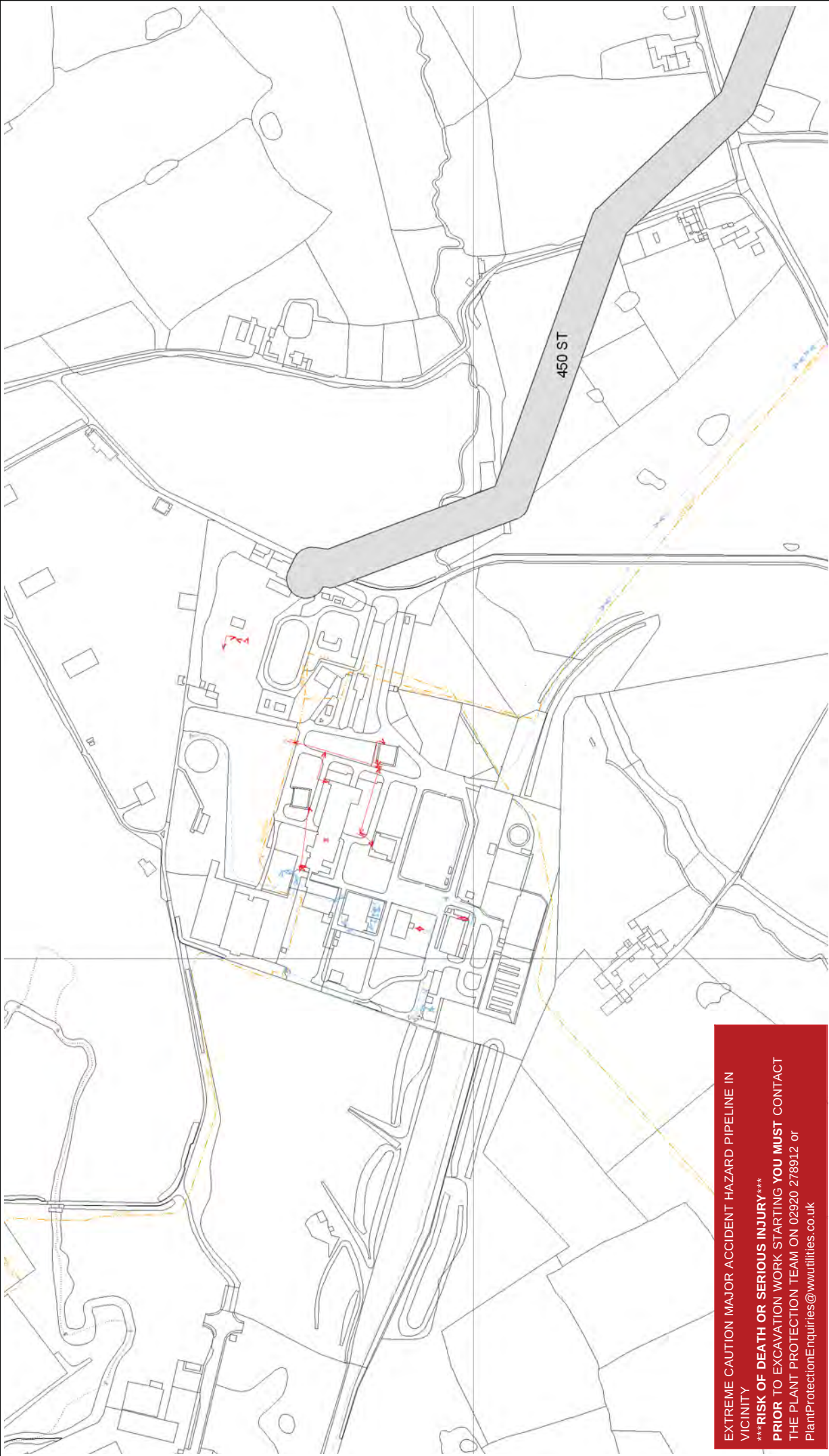
Scale: 1:3514

Dee Valley Water plc
Packsaddle
Wrexham Road
Rhoshyllen
Wrexham LL14 4EH
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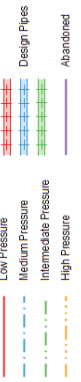
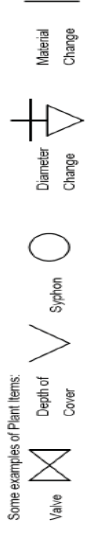
Based upon the Ordnance Survey map by Dee Valley Water plc by permission of Ordnance Survey and on behalf of the Controller of Her Majesty's Stationary Office

PLEASE NOTE - The information given here on the routes and locations of mains is indicative only and no warranty is given or implied
More precise information can be given by prior arrangement although the depth of any apparatus may not be ascertainable

DO NOT SCALE FROM THIS PRINT



EXTREME CAUTION MAJOR ACCIDENT HAZARD PIPELINE IN VICINITY
*****RISK OF DEATH OR SERIOUS INJURY*****
PRIOR TO EXCAVATION WORK STARTING YOU MUST CONTACT THE PLANT PROTECTION TEAM ON 02920 278912 or PlantProtectionEnquiries@wvuutilities.co.uk

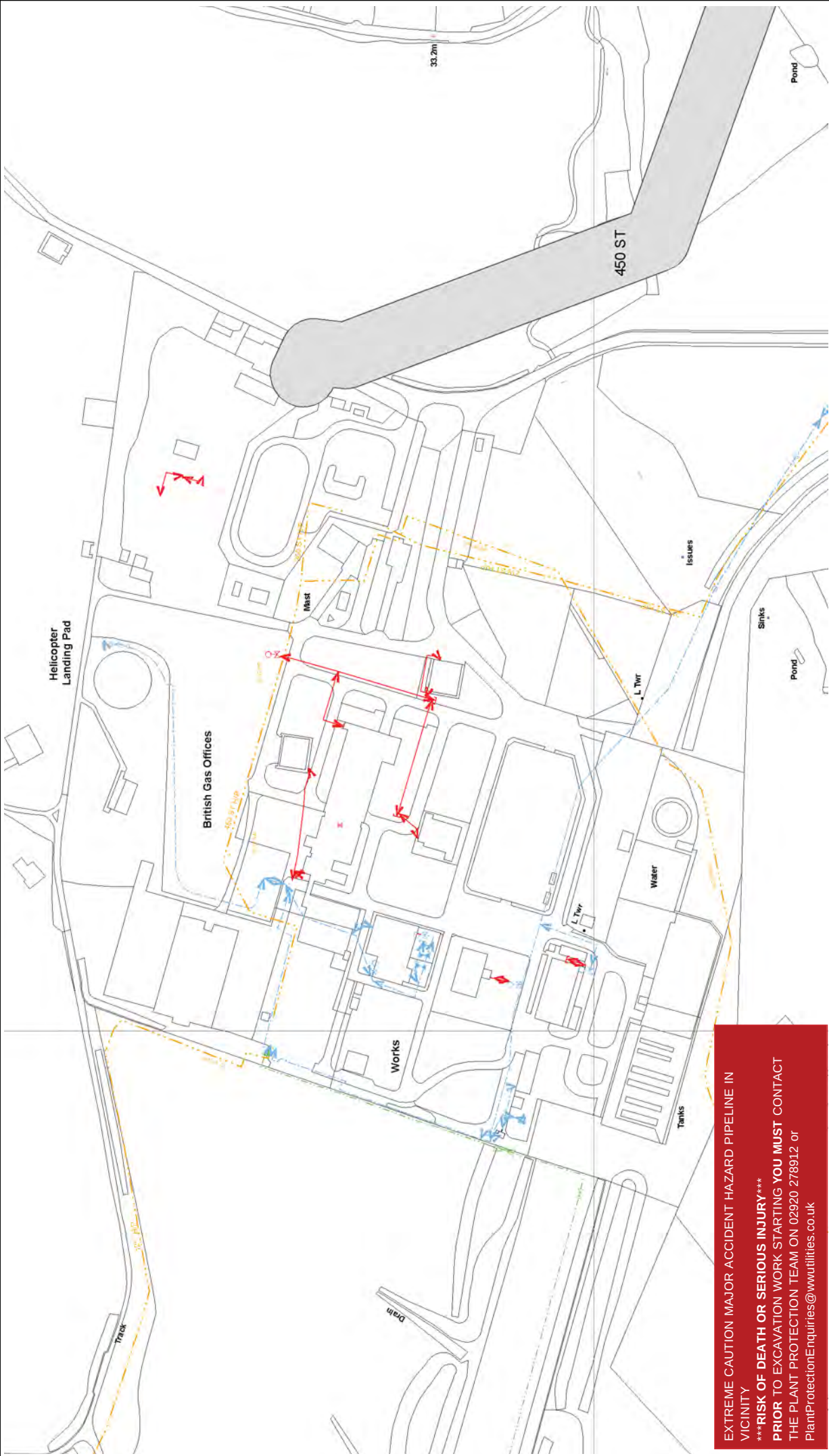
Scale	1:4695	   Some examples of Plant Items:
User ID	wwutilitiesWorleyParsaphovq	
Date	15/03/2011	
Grid Ref:	Easting 338210 Northing 348052	
Printed via WWU UtilityView		

TitleMaelor Wide

The plan shows those pipes owned by Wales & West Utilities (WVU) in its role as a Licensed Gas Transporter (GT). The information shown on this plan is derived from historic information and may have involved re-scaling plans, and the accuracy of it cannot be guaranteed. Service pipes, valves, and other apparatus are shown for information only and do not constitute a warranty. No warranties are therefore given in respect of it. WVU, its employees and contractors do not accept any liability for any inaccuracy or incompleteness in it.

You must use safe digging practices, in accordance with HSG47, to establish the actual position of mains, pipes, services and other apparatus on site before you start any excavation work. The information shown on this plan should not be used beyond 28 days from the date of issue of this plan as it is subject to updating.

This plan also provides indications of gas pipes owned by other GTs, or otherwise privately owned, which may be present in the area. This information is not information of WVU and WVU is unable to verify this information or to confirm whether it is accurate or complete. It is supplied voluntarily to assist the user in determining whether to make contact with other GTs or others. The user must obtain such information from the other GT or person concerned. WVU, its employees and contractors do not accept any liability for this information or any inaccuracy or incompleteness in it.



Scale		1:2711	Title		Maelor Works			
User ID	wwutilties\WorleyParsaphovq		The plan shows those pipes owned by Wales & West Utilities (WWU) in its role as a Licensed Gas Transporter (GT). The information shown on this plan is derived from historic information and may have involved re-scaling plans, and the accuracy of it cannot be guaranteed. Service pipes, valves, syphons, sub connectors, etc. may not be shown but their presence should be anticipated. No warranties are therefore given in respect of it. WWU its employees and contractors do not accept any liability for any inaccuracy or incompleteness in it. You must use safe digging practices, in accordance with HSG47, to establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you or near gas apparatus. The information shown on this plan should not be used beyond 28 days from the date of issue of this plan as it is subject to updating. This plan also provides indications of gas pipes owned by other GTs, or otherwise privately owned, which may be present in this area. This information is not information of WWU and WWU is unable to verify this information or to confirm whether it is accurate or complete. It is supplied voluntarily to assist the user in determining whether to make contact with other GTs or others. The user must obtain such information from the other GT or person concerned. WWU, its employees and contractors do not accept any liability for this information or any inaccuracy or incompleteness in it.					
Date	15/03/2011							
Grid Ref:	Easting 338160 Northing 348094							
Printed via WWU UtilityView								

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Low Pressure

Medium Pressure

Intermediate Pressure

High Pressure

Design Pipes

Abandoned

Valve

Syphon

Depth of Cover

Diameter Change

Material Change

Some examples of Plant Items:

Valve

Syphon

Depth of Cover

Diameter Change

Material Change

Appendix O
CD Format: DETS Laboratory AQ/AC Information

Appendix P
CD Format: Data Tables

