

Appendix 3.A

**DISTFW Rainfall and Runoff Input Files and Predicted
versus Observed Output Hydrographs and
Accompanying Statistics.**

1st January

RUM 96-97 Monitoring

pit 1 site

Rainfall 1/1/97 1550hrs

168

0	0	0.1833	9.2	0.35	21	0.5167	35.2	0.6833	44.6	0.85	55.4	1.0167	62	1.2667	66	1.6	69.2
0.0167	0.2	0.1917	9.6	0.3583	21.4	0.525	36	0.6917	45.4	0.8583	56	1.0333	62.2	1.2833	66.2	1.6333	69.2
0.025	0.4	0.2	9.8	0.3667	22.2	0.5333	36.4	0.7	45.8	0.8667	56.4	1.05	62.8	1.3	66.6	1.6667	69.6
0.0417	0.8	0.2083	10.2	0.375	22.8	0.5417	36.8	0.7083	46.6	0.875	56.8	1.0667	63	1.3167	66.6	1.6833	69.6
0.05	1	0.2167	11	0.3833	23.4	0.55	37.2	0.7167	47	0.8833	57.2	1.075	63.2	1.325	66.8	1.725	69.8
0.0583	1.2	0.225	11.4	0.3917	24.2	0.5583	37.6	0.725	47.4	0.8917	57.8	1.0917	63.4	1.3417	67	1.8	70
0.0667	1.6	0.2333	11.8	0.4	24.8	0.5667	38.2	0.7333	48	0.9	58	1.1	63.6	1.3667	67.2	1.85	70.2
0.075	2.2	0.2417	12.2	0.4083	25.4	0.575	38.4	0.7417	48.6	0.9083	58.4	1.1083	63.8	1.375	67.2	1.9	70.2
0.0833	2.4	0.25	13	0.4167	26	0.5833	38.8	0.75	49	0.9167	58.8	1.1167	64	1.3833	67.6		
0.0917	3	0.2583	13.4	0.425	27	0.5917	39	0.7583	49.6	0.925	59	1.125	64.2	1.4	67.8		
0.1	3.6	0.2667	14.2	0.4333	27.6	0.6	39.2	0.7667	50.2	0.9333	59.2	1.1417	64.6	1.425	68		
0.1083	4.2	0.275	14.8	0.4417	28.6	0.6083	39.6	0.775	50.8	0.9417	59.6	1.15	64.8	1.4333	68		
0.1167	4.8	0.2833	15.6	0.45	29.4	0.6167	39.8	0.7833	51.4	0.95	59.8	1.1667	65	1.4417	68		
0.125	5.4	0.2917	16.2	0.4583	30	0.625	40	0.7917	51.8	0.9583	60.2	1.175	65	1.45	68.2		
0.1333	6	0.3	16.8	0.4667	31.2	0.6333	40.6	0.8	52.4	0.9667	60.4	1.1833	65.2	1.475	68.6		
0.1417	6.6	0.3083	17.4	0.475	31.6	0.6417	41.2	0.8083	53.2	0.975	60.6	1.1917	65.2	1.4917	68.6		
0.15	7.2	0.3167	18	0.4833	32.2	0.65	41.8	0.8167	53.8	0.9833	60.8	1.2	65.6	1.5	68.8		
0.1583	7.8	0.325	18.8	0.4917	33.2	0.6583	42.8	0.825	54	0.9917	61.2	1.2167	65.6	1.5333	68.8		
0.1667	8.2	0.3333	19.4	0.5	33.8	0.6667	43.4	0.8333	54.6	1	61.4	1.2333	65.8	1.5417	69		
0.175	8.6	0.3417	20	0.5083	34.4	0.675	44	0.8417	54.8	1.0083	61.6	1.25	65.8	1.575	69		

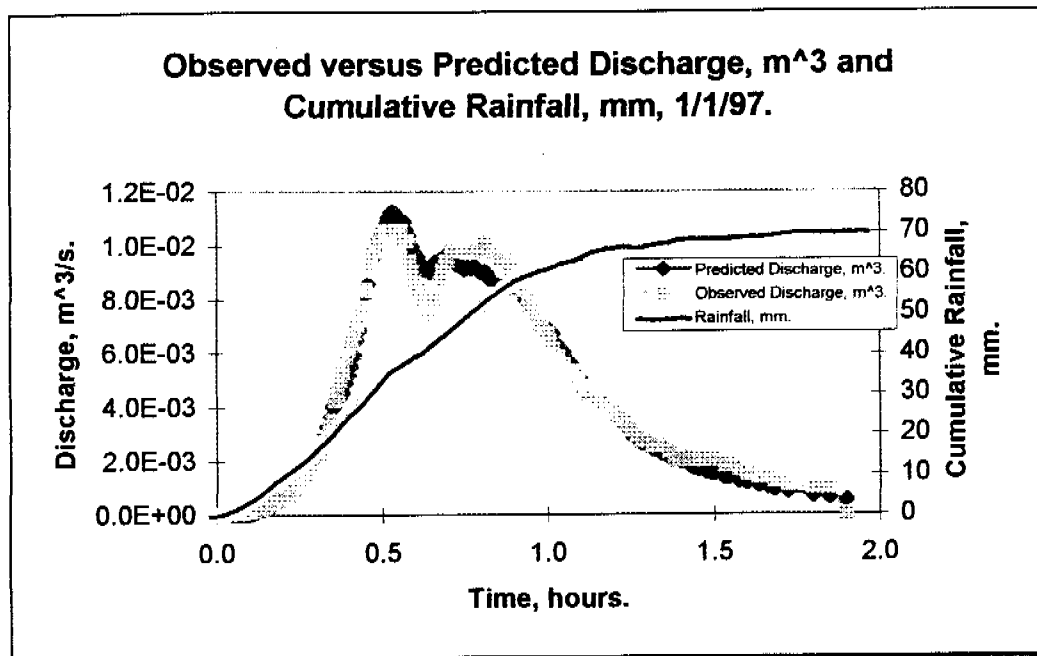
RUM 96-97 Monitoring

pit 1 site

Runoff 1/1/97 1550hrs

168

0	0	0.183	0.00044	0.35	0.00354	0.517	0.01054	0.683	0.00906	0.85	0.00979	1.017	0.00614	1.267	0.0029	1.6	0.00149
0.017	0.00001	0.192	0.00053	0.358	0.00425	0.525	0.01054	0.692	0.00942	0.858	0.00942	1.033	0.00585	1.283	0.0027	1.633	0.00135
0.025	0.00001	0.2	0.00063	0.367	0.0045	0.533	0.01054	0.7	0.00942	0.867	0.00942	1.05	0.00556	1.3	0.0027	1.667	0.00135
0.042	0.00001	0.208	0.00063	0.375	0.00502	0.542	0.01054	0.708	0.00979	0.875	0.00942	1.067	0.00529	1.317	0.00251	1.683	0.00121
0.05	0.00005	0.217	0.00073	0.383	0.00529	0.55	0.01054	0.717	0.00979	0.883	0.00906	1.075	0.00529	1.325	0.00251	1.725	0.00108
0.058	0.00005	0.225	0.00084	0.392	0.00585	0.558	0.01054	0.725	0.00979	0.892	0.00906	1.092	0.00502	1.342	0.00251	1.8	0.00096
0.067	0.00005	0.233	0.00096	0.4	0.00614	0.567	0.01016	0.733	0.00979	0.9	0.00906	1.1	0.00475	1.367	0.00232	1.85	0.00096
0.075	0.00005	0.242	0.00108	0.408	0.00643	0.575	0.01016	0.742	0.00979	0.908	0.00906	1.108	0.00475	1.375	0.00232	1.900	0.000
0.083	0.00005	0.25	0.00121	0.417	0.00674	0.583	0.00942	0.75	0.00979	0.917	0.00871	1.117	0.00475	1.383	0.00197		
0.092	0.0001	0.258	0.00135	0.425	0.00705	0.592	0.00906	0.758	0.00979	0.925	0.00836	1.125	0.0045	1.4	0.00197		
0.1	0.0001	0.267	0.00149	0.433	0.00737	0.6	0.00871	0.767	0.00979	0.933	0.00836	1.142	0.00475	1.425	0.00197		
0.108	0.00015	0.275	0.00165	0.442	0.00769	0.608	0.00836	0.775	0.00979	0.942	0.00803	1.15	0.00425	1.433	0.00214		
0.117	0.00015	0.283	0.0018	0.45	0.00836	0.617	0.00836	0.783	0.00979	0.95	0.00769	1.167	0.00401	1.442	0.00197		
0.125	0.00021	0.292	0.00197	0.458	0.00906	0.625	0.00803	0.792	0.00979	0.958	0.00769	1.175	0.00401	1.45	0.00197		
0.133	0.00021	0.3	0.00214	0.467	0.00942	0.633	0.00737	0.8	0.00979	0.967	0.00737	1.183	0.00401	1.475	0.00197		
0.142	0.00021	0.308	0.00232	0.475	0.00979	0.642	0.00737	0.808	0.01016	0.975	0.00705	1.192	0.00377	1.492	0.00197		
0.15	0.00028	0.317	0.00251	0.483	0.01016	0.65	0.00737	0.817	0.01016	0.983	0.00705	1.2	0.00377	1.5	0.00197		
0.158	0.00036	0.325	0.0027	0.492	0.01016	0.658	0.00803	0.825	0.00979	0.992	0.00674	1.217	0.00354	1.533	0.0018		
0.167	0.00036	0.333	0.0029	0.5	0.01054	0.667	0.00803	0.833	0.00979	1	0.00674	1.233	0.00332	1.542	0.0018		
0.175	0.00044	0.342	0.00332	0.508	0.01054	0.675	0.00871	0.842	0.00979	1.008	0.00643	1.25	0.00311	1.575	0.00165		



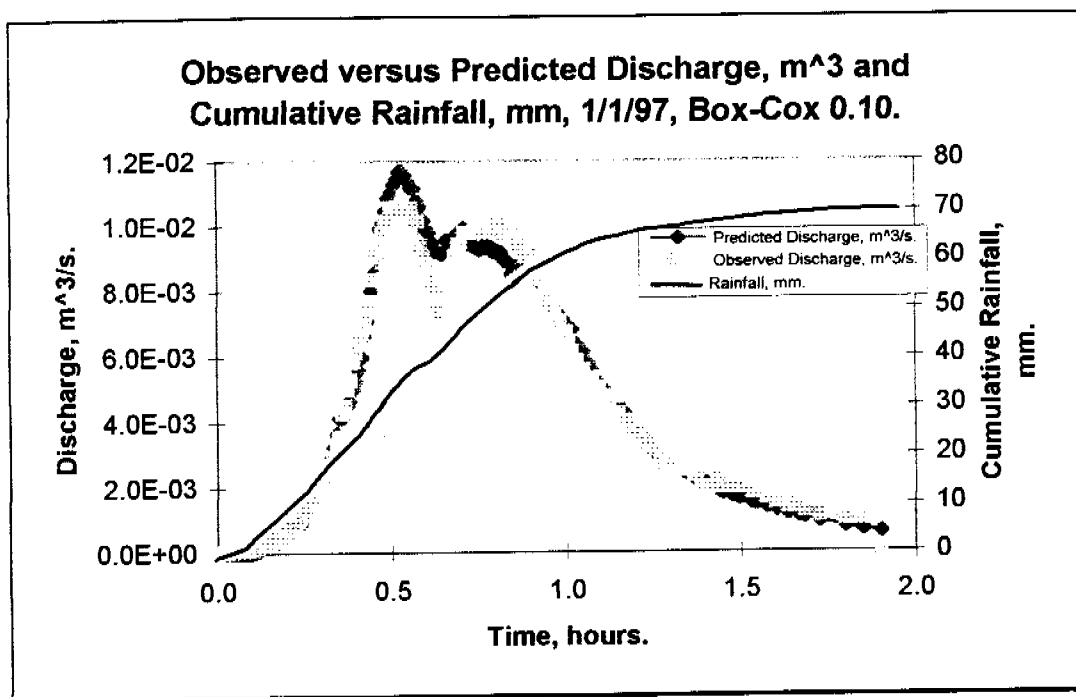
NLFIT Input files: 1197.fw, 1197.ro/rf.

NLFIT Output files: 1197L.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_T	1.68372	0.0811	$S\phi$	7.94852	1.52483
e_m	1.67457	0.0833	ϕ	0.2795	2.24711

Convergence Monitor	R^2 , %	Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%	Exceedances.	Exceedances.
2.73959	97.9	0.7986	0.1493	-9.497	0.1091	0.069	11	3

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate at 97.9%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 11 times, and the partial auto-correlation plot is exceeded 3 times.



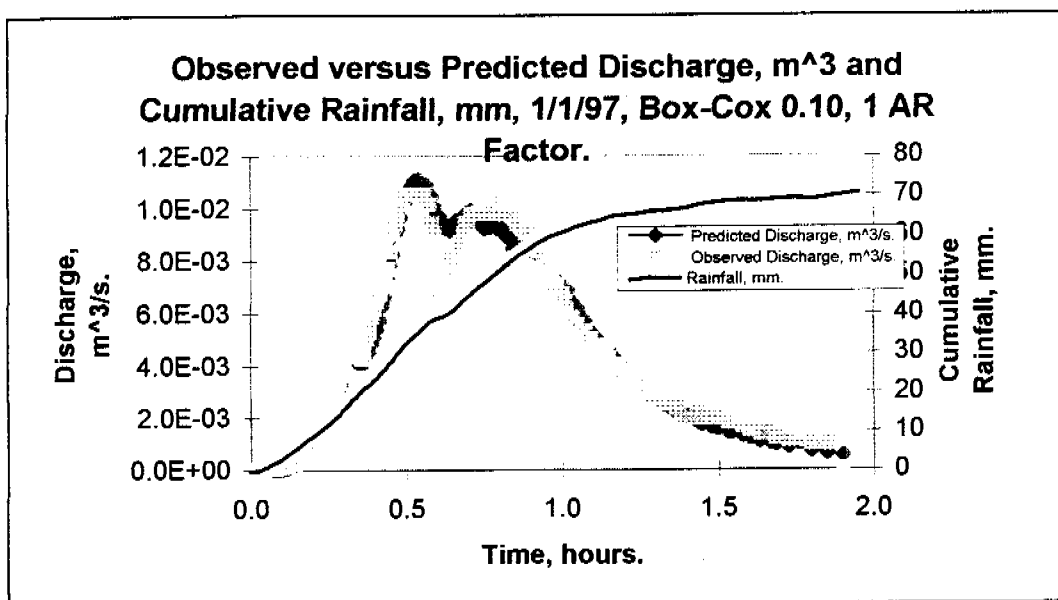
NLFIT Input files: 1197.fw, 1197.ro/rf.

NLFIT Output files: 1197WG10.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	1.80267	0.07523	$S\phi$	7.25475	0.2133
e_m	1.79591	0.04182	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
Convergence Monitor.	R^2 , %.							
0.01059	97.9	0.7234	0.1493	-9.699	0.0687	0.069	11	3

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate at 97.9%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 11 times, and the partial auto-correlation plot is exceeded 3 times.



NLFIT Input files: 1197.fw, 1197.ro/rf.

NLFIT Output files: 1197WAR1.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C _r	1.5285	0.176085	S ϕ	7.8249	0.71538
e _m	1.63087	0.09052	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R ² , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.02893	97.9	0.0765	0.1493	-0.719	0.1563	0.069	0	0

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R² is adequate at 97.9%, the cumulative periodogram does pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 0 times, and the partial auto-correlation plot is exceeded 0 times.

General Comment: There is little difference between the three plots, a Box-Cox of 0.10 was evaluated to give the best fit, the Box-Cox plot seemed to over-predict the first peak, yet the inclusion of an auto-regressive factor addressed this issue. Thus the best plot is 1197war1.*.

3rd January

RUM 96-97 Monitoring

pit 1 site

Rainfall 3/1/97 0400hrs

254

0	0	0.724	4.2	1.09	9	1.442	13.6	1.793	18.4	1.89	23.4	1.993	28.4	2.103	33	2.254	37.6	2.463	42.4	2.726	47	3.024	51.4	3.881	55.8
0.05	0.2	0.761	4.4	1.113	9.2	1.46	13.8	1.794	18.6	1.896	23.6	1.997	28.6	2.114	33.4	2.265	37.8	2.481	42.8	2.735	47.2	3.063	51.6	3.947	56
0.1	0.4	0.79	4.6	1.132	9.4	1.475	14.2	1.806	18.8	1.901	24	1.999	28.8	2.125	33.6	2.275	38.2	2.49	43	2.744	47.4	3.096	51.8	4.024	56.2
0.142	0.6	0.817	5	1.133	9.6	1.497	14.4	1.815	19	1.908	24.2	2.003	29	2.133	33.8	2.282	38.4	2.497	43.2	2.746	47.6	3.097	52	4.096	56.4
0.186	1	0.843	5.2	1.15	9.8	1.515	14.6	1.825	19.4	1.914	24.4	2.01	29.2	2.14	34.2	2.292	38.6	2.506	43.4	2.756	47.8	3.129	52.2	4.276	56.8
0.232	1.2	0.857	5.4	1.167	10	1.538	14.8	1.831	19.6	1.919	24.8	2.014	29.4	2.15	34.4	2.303	39	2.517	43.8	2.765	48	3.169	52.4	4.5	57
0.271	1.4	0.871	5.6	1.182	10.2	1.556	15.2	1.835	19.8	1.925	25	2.015	29.6	2.163	34.6	2.317	39.2	2.531	44	2.776	48.2	3.221	52.6	4.601	57.2
0.311	1.6	0.883	6	1.183	10.4	1.576	15.4	1.84	20.2	1.932	25.4	2.021	29.8	2.172	34.8	2.329	39.4	2.551	44.2	2.789	48.6	3.29	52.8	4.713	57.4
0.361	1.8	0.903	6.2	1.197	10.6	1.594	15.6	1.846	20.4	1.938	25.6	2.026	30	2.174	35	2.342	39.6	2.557	44.4	2.803	48.8	3.353	53.2	4.75	57.6
0.363	2	0.922	6.4	1.217	10.8	1.611	15.8	1.85	20.6	1.943	25.8	2.032	30.4	2.182	35.2	2.356	40	2.558	44.6	2.824	49	3.393	53.4	4.768	57.8
0.404	2.2	0.933	6.8	1.243	11	1.628	16.2	1.851	20.8	1.949	26.2	2.039	30.6	2.188	35.4	2.368	40.2	2.564	44.8	2.84	49.2	3.439	53.6	4.769	58
0.439	2.4	0.944	7	1.274	11.4	1.65	16.4	1.856	21	1.954	26.4	2.044	30.8	2.192	35.6	2.379	40.4	2.571	45	2.856	49.4	3.489	53.8	4.785	58.2
0.485	2.6	0.958	7.2	1.293	11.6	1.681	16.6	1.86	21.4	1.96	26.6	2.05	31.2	2.193	35.8	2.392	40.6	2.582	45.4	2.869	49.8	3.542	54	4.821	58.4
0.531	2.8	0.975	7.4	1.308	11.8	1.706	16.8	1.864	21.6	1.961	26.8	2.056	31.4	2.197	36	2.399	40.8	2.596	45.6	2.882	50	3.568	54.2	4.9	58.4
0.532	3	0.994	7.6	1.326	12	1.707	17	1.868	22	1.965	27	2.061	31.6	2.204	36.2	2.4	41	2.618	45.8	2.894	50.2	3.569	54.4		
0.583	3.2	0.996	7.8	1.346	12.4	1.729	17.2	1.872	22.2	1.971	27.2	2.063	31.8	2.214	36.6	2.407	41.2	2.644	46	2.911	50.4	3.606	54.6		
0.624	3.4	1.015	8	1.367	12.6	1.747	17.4	1.876	22.6	1.976	27.4	2.069	32	2.224	36.8	2.414	41.4	2.679	46.2	2.932	50.6	3.646	54.8		
0.658	3.6	1.035	8.2	1.389	12.8	1.758	17.8	1.881	22.8	1.978	27.6	2.076	32.2	2.233	37	2.421	41.8	2.701	46.4	2.933	50.8	3.701	55		
0.694	3.8	1.05	8.6	1.411	13	1.768	18	1.885	23	1.982	27.8	2.085	32.6	2.243	37.2	2.429	42	2.703	46.6	2.964	51	3.765	55.2		
0.696	4	1.067	8.8	1.426	13.4	1.781	18.2	1.886	23.2	1.988	28.2	2.093	32.8	2.244	37.4	2.446	42.2	2.715	46.8	2.992	51.2	3.822	55.6		

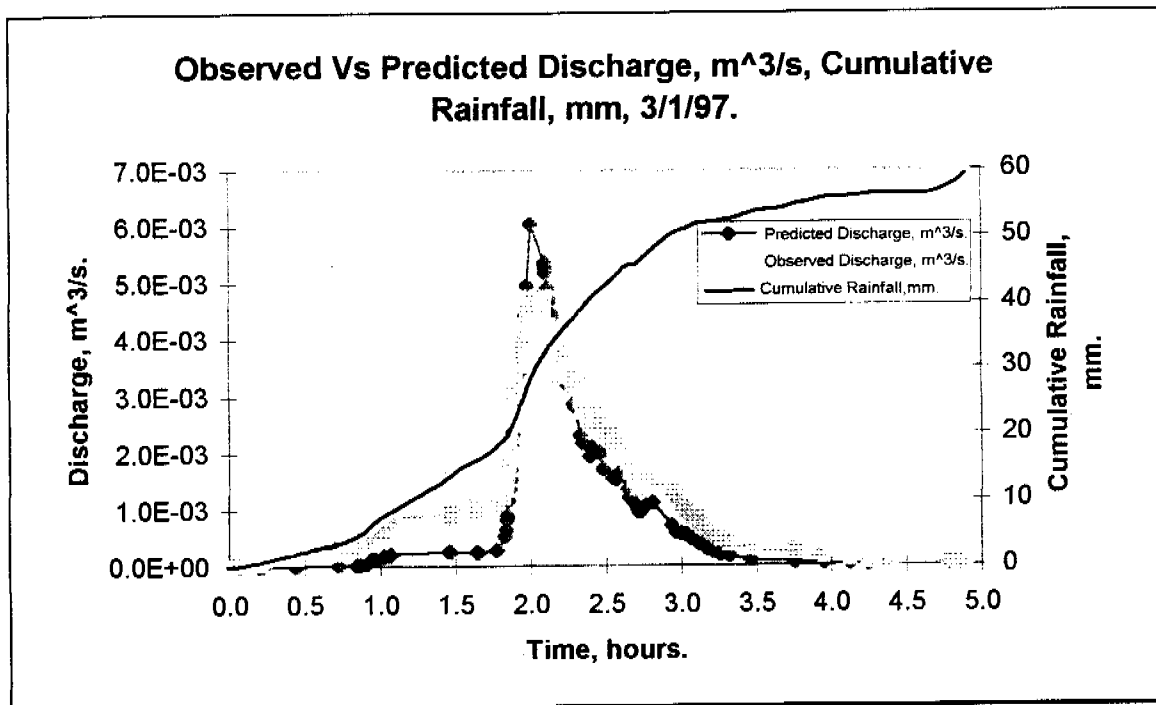
RUM 96-97 Monitoring

pit 1 site

Runoff 3/1/97 0400hrs

131

0	0	1.024	7.29E-04	1.865	2.14E-03	2.122	4.25E-03	2.388	2.51E-03	2.814	1.49E-03	3.76	2.14E-04
0.067	5.07E-05	1.063	8.39E-04	1.868	2.32E-03	2.124	4.01E-03	2.406	2.70E-03	2.936	1.35E-03	3.761	2.83E-04
0.068	9.97E-06	1.064	7.29E-04	1.876	2.51E-03	2.131	3.77E-03	2.453	2.51E-03	2.967	1.21E-03	3.763	2.14E-04
0.093	5.07E-05	1.075	8.39E-04	1.882	2.70E-03	2.132	4.01E-03	2.454	2.70E-03	3.004	1.08E-03	3.946	1.53E-04
0.094	9.97E-06	1.458	9.57E-04	1.889	2.90E-03	2.135	3.77E-03	2.456	2.51E-03	3.036	9.57E-04	4.122	9.84E-05
0.096	5.07E-05	1.463	8.39E-04	1.894	3.11E-03	2.139	4.01E-03	2.479	2.32E-03	3.068	8.39E-04	4.251	5.07E-05
0.207	9.84E-05	1.464	9.57E-04	1.903	3.32E-03	2.144	3.77E-03	2.543	2.14E-03	3.121	7.29E-04	4.351	9.97E-06
0.208	5.07E-05	1.639	1.08E-03	1.924	3.54E-03	2.165	3.54E-03	2.565	2.32E-03	3.122	8.39E-04	4.779	5.07E-05
0.222	9.84E-05	1.642	9.57E-04	1.939	3.77E-03	2.178	3.32E-03	2.604	2.14E-03	3.124	7.29E-04	4.858	9.84E-05
0.442	1.53E-04	1.647	1.08E-03	1.95	4.01E-03	2.192	3.54E-03	2.626	1.97E-03	3.172	6.26E-04	4.86	5.07E-05
0.724	2.14E-04	1.649	9.57E-04	1.965	4.25E-03	2.199	3.77E-03	2.643	1.80E-03	3.213	5.30E-04	4.9	0
0.846	2.83E-04	1.65	1.08E-03	1.978	4.50E-03	2.224	3.54E-03	2.66	1.65E-03	3.26	4.41E-04		
0.875	3.58E-04	1.651	9.57E-04	2.004	4.75E-03	2.239	3.32E-03	2.678	1.49E-03	3.261	5.30E-04		
0.911	4.41E-04	1.776	1.08E-03	2.093	4.50E-03	2.244	3.54E-03	2.708	1.35E-03	3.263	4.41E-04		
0.94	5.30E-04	1.825	1.21E-03	2.094	4.75E-03	2.246	3.32E-03	2.715	1.49E-03	3.324	3.58E-04		
0.967	6.26E-04	1.835	1.35E-03	2.096	4.50E-03	2.281	3.11E-03	2.717	1.35E-03	3.325	4.41E-04		
1.017	7.29E-04	1.84	1.49E-03	2.097	4.75E-03	2.285	3.32E-03	2.718	1.49E-03	3.326	3.58E-04		
1.019	6.26E-04	1.846	1.65E-03	2.099	4.50E-03	2.29	3.11E-03	2.719	1.35E-03	3.463	2.83E-04		
1.021	7.29E-04	1.854	1.80E-03	2.11	4.25E-03	2.328	2.90E-03	2.728	1.49E-03	3.756	2.14E-04		
1.022	6.26E-04	1.86	1.97E-03	2.121	4.01E-03	2.34	2.70E-03	2.761	1.65E-03	3.757	2.83E-04		



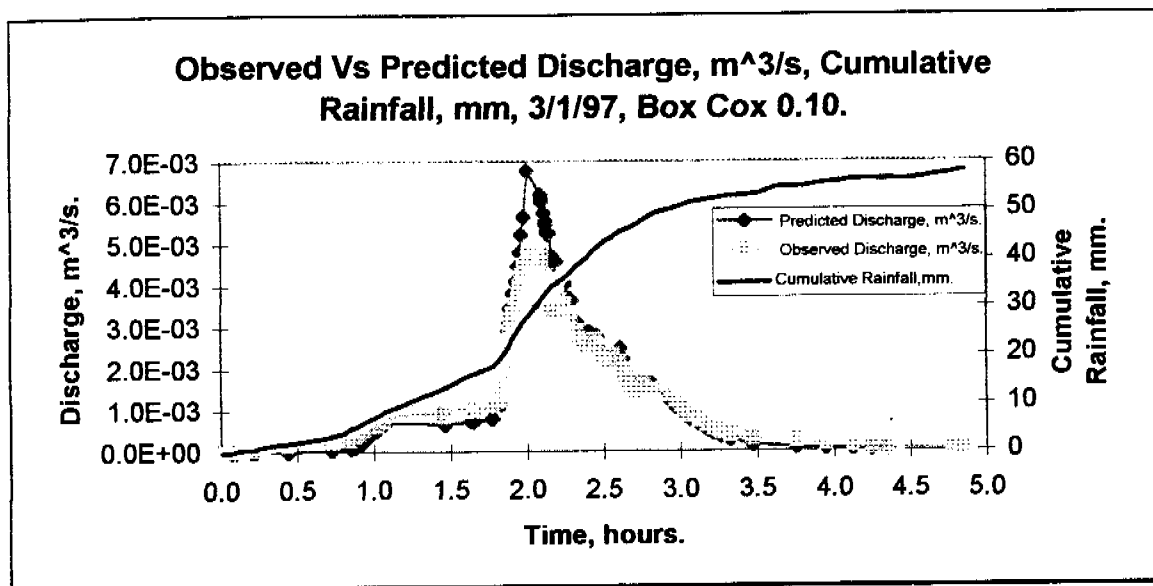
NLFIT Input files: 3197.fw, 3197.ro/rf.

NLFIT Output files: 3197.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	4.47971	1.57423	$S\phi$	0.245176	1.86864
e_m	1.54443	0.198571	ϕ	13.6394	2.0712

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
4.14001	95.4	0.8526	0.17	-9.383	0.1171	0.078	13	8

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate at 95.4%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 13 times, and the partial auto-correlation plot is exceeded 8 times.



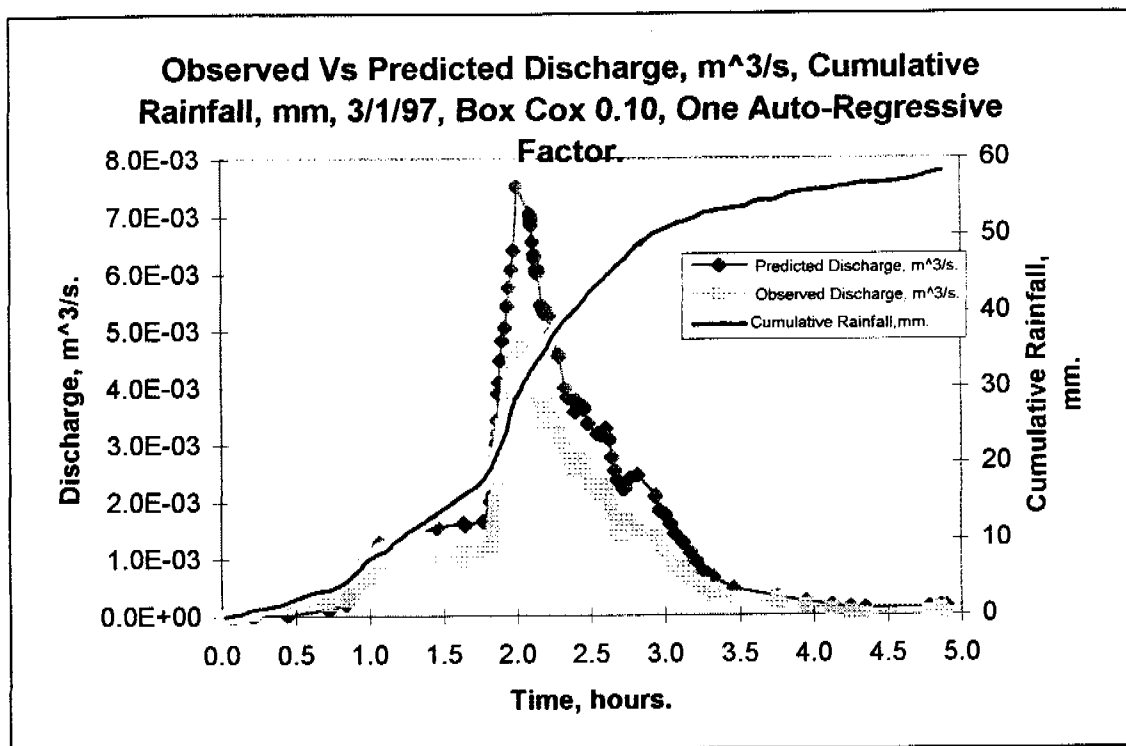
NLFIT Input files: 3197.fw, 3197.ro/rf.

NLFIT Output files: 3197WG10.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	4.00082	0.66808	$S\phi$	0.001	
e_m	1.55394	0.081335	ϕ	9.03137	0.280544

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R ² , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.25	98.2	0.866	0.17	-9.144	0.1089	0.0781	15	6

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R² is adequate and improved at 98.2%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 15 times, and the partial auto-correlation plot is exceeded 6 times.



NLFIT Input files: 3197.fw, 3197.ro/rf.

NLFIT Output files: 3197WAR1.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	4.00082	0.66808	$S\phi$	0.001	
e_m	1.55394	0.081335	ϕ	9.03137	0.280544

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1053	99.3	0.3261	0.17	3.611	0.086	0.0781	1	1

Storm Specific Comment: The convergence monitor is adequate, 0.1, the R^2 is adequate at 99.3%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 1 times, and the partial auto-correlation plot is exceeded 1 times.

General Comment: The first plot is an adequate fit in the centre, the inclination and recession limbs are fitted badly, the centre section is over-predicted only slightly. When a more general error model is adopted, a Box-Cox of 0.10, a better fit is obtained in the inclination and recession limbs. The addition of an auto-regressive factor results in a model which over-predicts everywhere except at the beginning and at the end.

3rd pm January

RUM 96-97 Monitoring

pit 1 site

Rainfall 3/1/97 1139hrs

63

0	0	1.35	4.6	2.156	9.6	2.982	14.2
0.082	0.4	1.375	5	2.182	9.8	3.215	14.4
0.264	0.6	1.392	5.2	2.183	10	4.1	14.4
0.599	0.8	1.406	5.4	2.201	10.2		
0.676	1	1.417	5.6	2.215	10.4		
0.749	1.2	1.432	6	2.236	10.6		
0.819	1.4	1.456	6.2	2.261	10.8		
0.821	1.6	1.485	6.4	2.263	11		
0.89	1.8	1.558	6.6	2.308	11.2		
0.944	2	1.679	7	2.329	11.4		
0.985	2.2	1.724	7.2	2.353	11.6		
1.019	2.4	1.764	7.4	2.378	12		
1.058	2.8	1.831	7.6	2.394	12.2		
1.092	3	1.856	8	2.413	12.4		
1.128	3.2	1.879	8.2	2.46	12.6		
1.178	3.4	1.925	8.4	2.518	13		
1.214	3.6	1.971	8.6	2.571	13.2		
1.249	4	2.038	9	2.579	13.4		
1.297	4.2	2.101	9.2	2.593	13.6		
1.322	4.4	2.132	9.4	2.653	14		

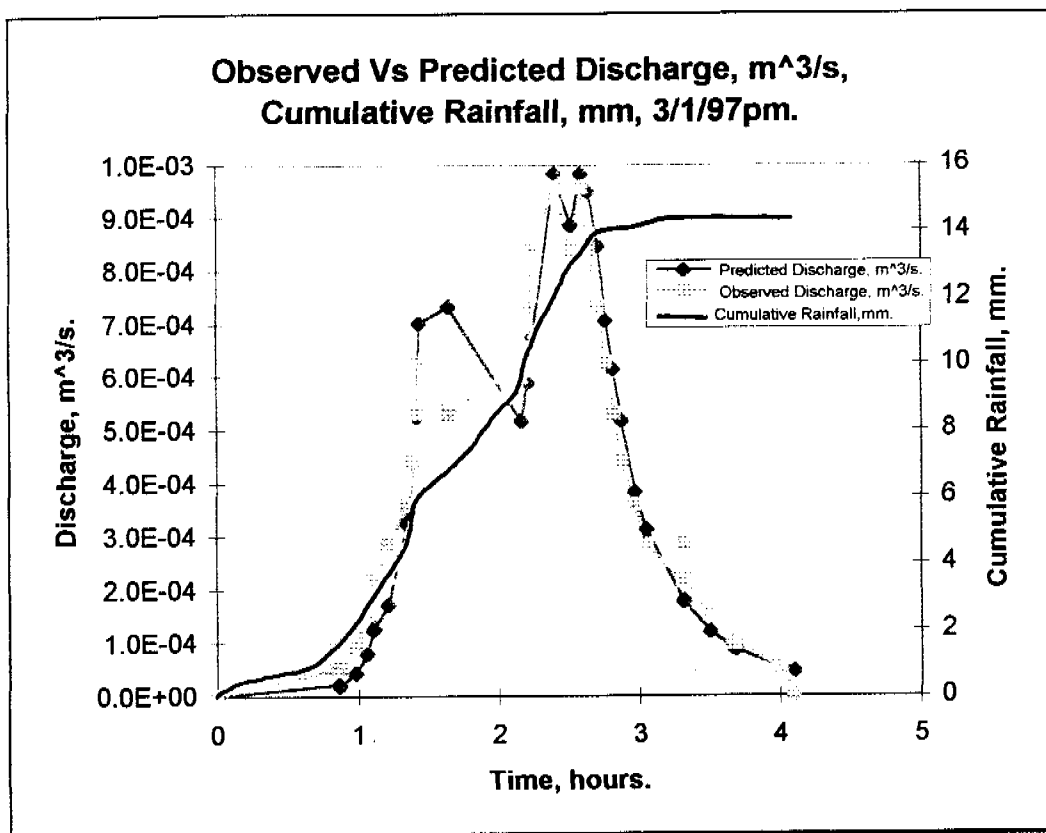
RUM 96-97 Monitoring

pit 1 site

Runoff 3/1/97 1139hrs

49

0	0	2.206	7.29E-04	3.661	9.84E-05
0.858	5.07E-05	2.242	8.39E-04	3.663	1.53E-04
0.867	9.97E-06	2.399	9.57E-04	3.664	9.84E-05
0.869	5.07E-05	2.51	8.39E-04	3.665	1.53E-04
0.982	9.84E-05	2.59	9.57E-04	3.667	9.84E-05
1.06	1.53E-04	2.636	8.39E-04	3.675	1.53E-04
1.107	2.14E-04	2.639	9.57E-04	3.676	9.84E-05
1.11	1.53E-04	2.64	8.39E-04	4.013	5.07E-05
1.111	2.14E-04	2.704	7.29E-04	4.1	0
1.214	2.83E-04	2.764	6.26E-04		
1.349	3.58E-04	2.819	5.30E-04		
1.35	2.83E-04	2.875	4.41E-04		
1.351	3.58E-04	2.967	3.58E-04		
1.389	4.41E-04	3.05	2.83E-04		
1.413	5.30E-04	3.31	2.14E-04		
1.438	6.26E-04	3.311	2.83E-04		
1.642	5.30E-04	3.314	2.14E-04		
2.157	6.26E-04	3.5	1.53E-04		
2.158	5.30E-04	3.501	2.14E-04		
2.161	6.26E-04	3.503	1.53E-04		



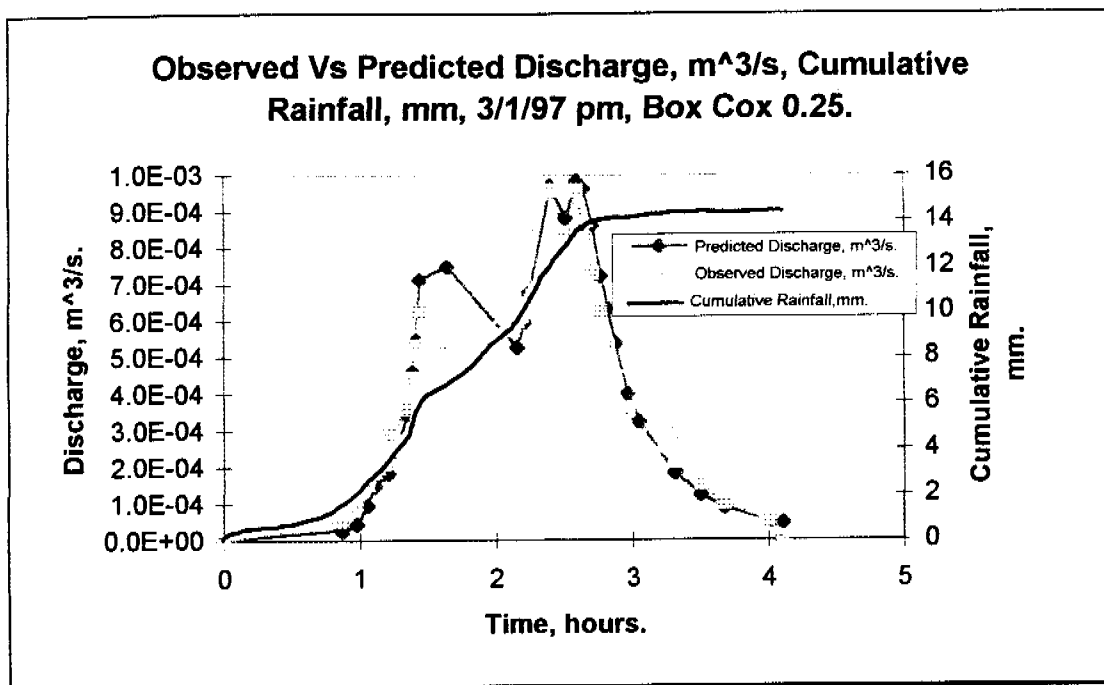
NLFIT Input files: 3197pm.fw, 3197pm.ro/rf.

NLFIT Output files: 3197pmn.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	5.15159	1.82944	$S\phi$	0.001	
c_m	1.91751	0.138991	ϕ	2.27864	0.135633

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.0159	93.9	0.4443	0.3206	-4.405	0.0859	0.1441	2	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 93.9%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 2 times, and the partial auto-correlation plot is exceeded 2 times.



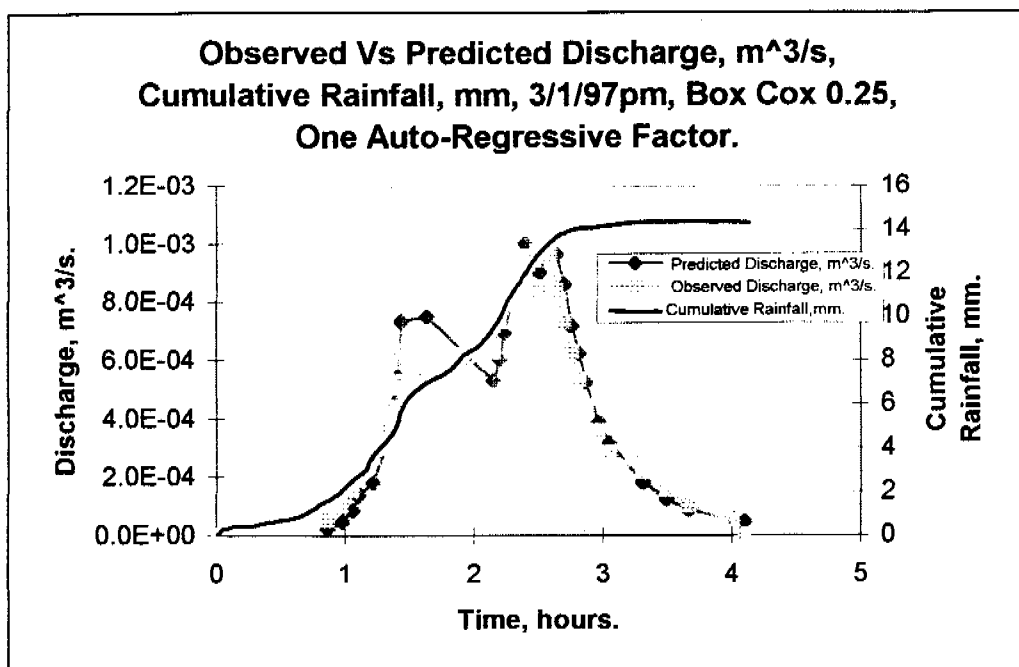
NLFIT Input files: 3197pm.fw, 3197pm.ro/rf.

NLFIT Output files: 31pmn25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	4.08908	1.39135	$S\phi$	0.001	
e_m	1.83423	0.132293	ϕ	2.23393	0.143048

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.017768	93.7	0.4666	0.3206	-4.473	0.0779	0.1441	5	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 93.7%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 5 times, and the partial auto-correlation plot is exceeded 2 times.



NLFIT Input files: 3197pm.fw, 3197pm.ro/rf.

NLFIT Output files: 31pmn25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	4.08908	1.39135	$S\phi$	0.001	
e_m	1.83423	0.132293	ϕ	2.23393	0.143048

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.017768	93.7	0.4666	0.3206	-4.473	0.0779	0.1441	5	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 93.7%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 5 times, and the partial auto-correlation plot is exceeded 2 times.

General Comment: The initial plot is adequate with respect to fit in the inclination and recession limbs, however there is over-prediction between 1.5 and 2.5 hours. It should be noted that this storm is only very small, 14.4mm over four hours. The inclusion of a more general error model with a Box-Cox factor of 0.25, improves the general fit, especially in the inclining limb. The inclusion of an auto-regressive factor made little impact on the quality of the model prediction.

4th January

RUM 96-97 Monitoring

pit 1 site

Rainfall 4/1/97 2324hrs

54

0	0	1.122	4.6	1.418	9.4
0.042	0.4	1.14	5	1.419	9.6
0.247	0.6	1.151	5.2	1.496	9.8
0.403	0.8	1.16	5.4	1.526	10
0.621	1	1.168	5.8	1.626	10.2
0.733	1.4	1.178	6	1.663	10.4
0.806	1.6	1.193	6.2	1.664	10.6
0.872	1.8	1.201	6.6	1.707	10.8
0.922	2	1.21	6.8	1.747	11
0.957	2.2	1.218	7	1.801	11.2
0.958	2.4	1.232	7.2	1.928	11.6
0.99	2.6	1.246	7.6	2.004	11.8
1.015	2.8	1.26	7.8	2.143	12
1.026	3.2	1.271	8	2.325	12.2
1.032	3.4	1.286	8.2	3.900	12.2
1.039	3.6	1.299	8.4		
1.049	3.8	1.3	8.6		
1.05	4	1.315	8.8		
1.065	4.2	1.332	9		
1.086	4.4	1.365	9.2		

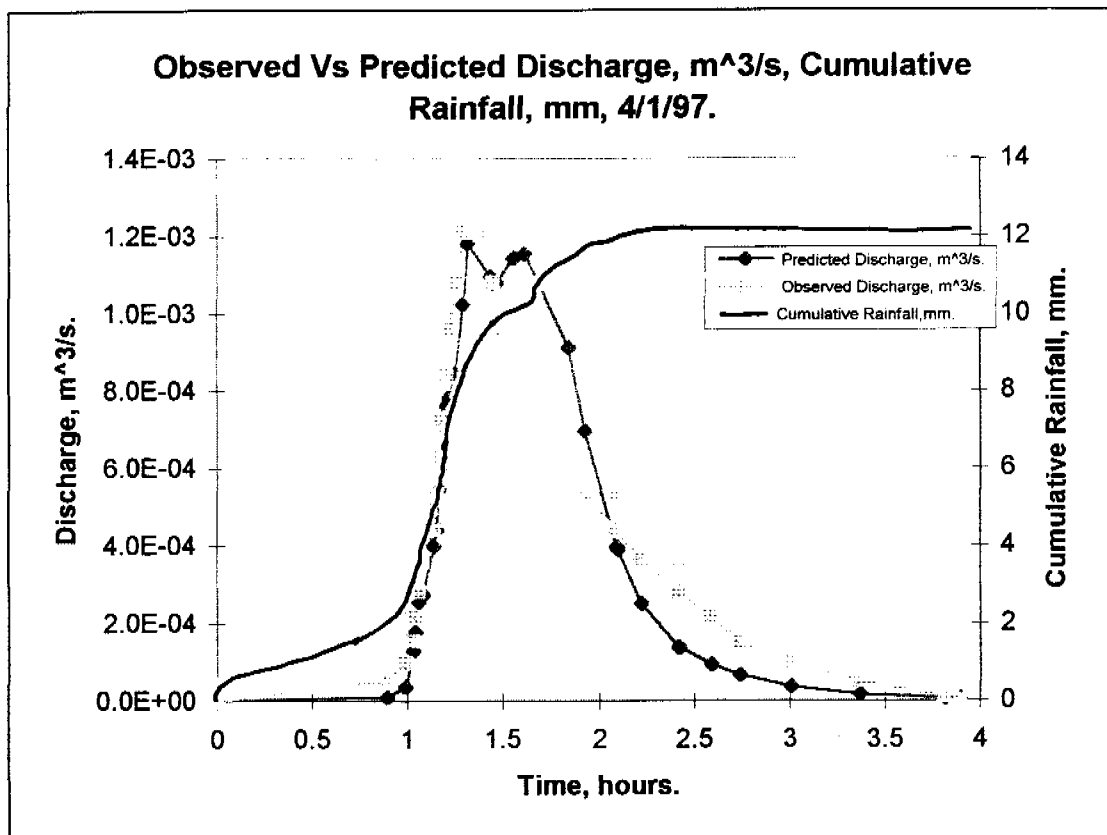
RUM 96-97 Monitoring

pit 1 site

Runoff 4/1/97 2324hrs

36

0	0	1.615	7.29E-04
0.893	5.07E-05	1.844	6.26E-04
0.994	9.84E-05	1.925	5.30E-04
1.031	1.53E-04	2.094	4.41E-04
1.042	2.14E-04	2.096	5.30E-04
1.056	2.83E-04	2.099	4.41E-04
1.081	3.58E-04	2.222	3.58E-04
1.142	4.41E-04	2.419	2.83E-04
1.156	5.30E-04	2.421	3.58E-04
1.168	6.26E-04	2.422	2.83E-04
1.178	7.29E-04	2.593	2.14E-04
1.204	8.39E-04	2.738	1.53E-04
1.217	9.57E-04	3.011	9.84E-05
1.251	1.08E-03	3.374	5.07E-05
1.294	1.21E-03	3.817	9.97E-06
1.318	1.35E-03	3.9	0
1.432	1.21E-03		
1.446	1.08E-03		
1.465	9.57E-04		
1.554	8.39E-04		



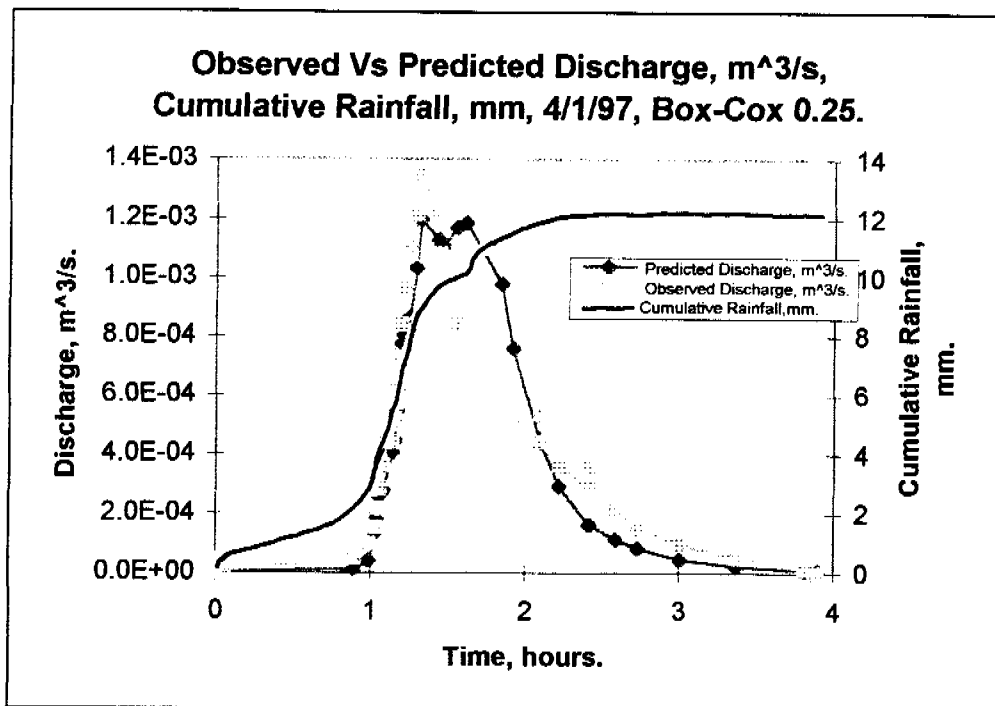
NLFIT Input files: 4197.fw, 4197.ro/rf.

NLFIT Output files: 4197.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	6.775246	0.164583	$S\phi$	0.001	
e_m	1.29117	0.103352	ϕ	3.78292	0.458148

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.213098	87.3	0.6704	0.3298	-4.293	0.2174	0.1479	7	4

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is not adequate 87.3%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 7 times, and the partial auto-correlation plot is exceeded 4 times.

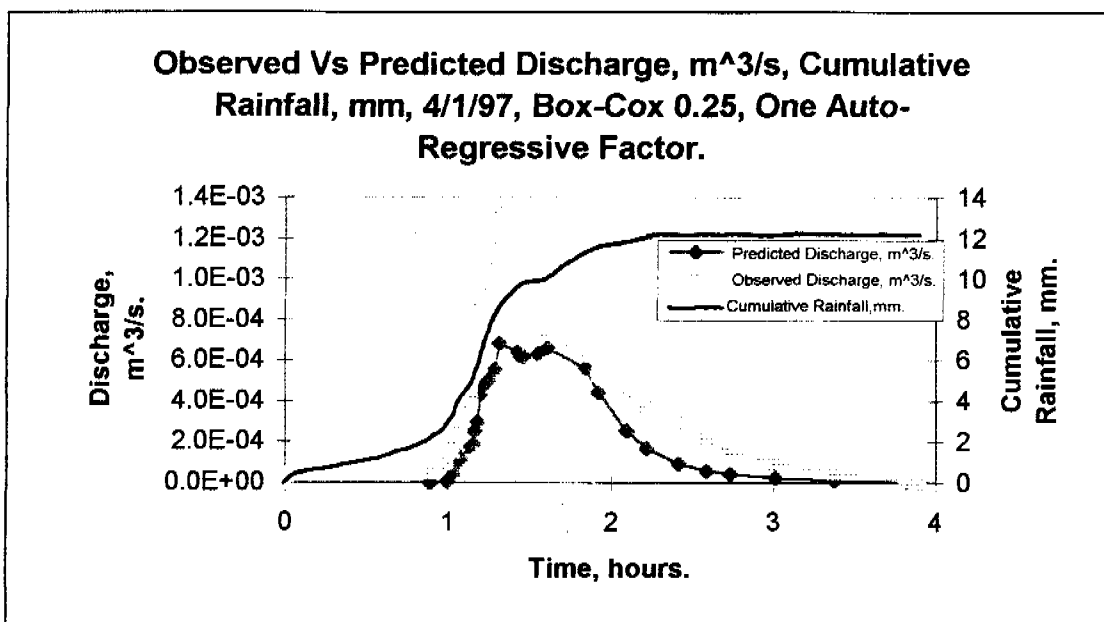


NLFIT Input files: 4197.fw, 4197.ro/rf.
NLFIT Output files: 4197G25.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.77032	0.152273	$S\phi$	0.001	
e_m	1.31183	0.09616	ϕ	3.29316	0.405084

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.196123	86.5	0.6981	0.3298	-4.604	0.2067	0.1479	6	4

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is not adequate 86.5%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 6 times, and the partial auto-correlation plot is exceeded 4 times.



NLFIT Input files: 4197.fw, 4197.ro/rf.

NLFIT Output files: 419725A.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.931426	0.272287	$S\phi$	0.001	
e_m	1.33777	0.125770	ϕ	9.52134	2.54988

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
Convergence Monitor.	R^2 , %.	0.3442	0.3298	-3.586	0.0718	0.1479	1	1

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is not adequate 84.6%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 1 times, and the partial auto-correlation plot is exceeded 1 times.

General Comments: The least squares prediction, 4197.*, was a relatively poor fit, however the inclining limb of the hydrograph was adequate. The peak is over-predicted and the recession limb changes from over-prediction to under-prediction. The recession limb, beyond 2 hours of the more general error model, Box-Cox 0.25, has a better shape when compared to the least squares fit, yet it suffers also from over prediction of the peak discharge and initial component of the recession limb. The inclusion of an auto-regressive factor was not advantageous as under-prediction was observed at every point.

11th-12th January

RUM 96-97 Monitoring

pit 1 site

Rainfall 11-12/1/97 2200hrs

149

0	0	1.34	5	1.382	10	1.421	15.6	1.478	21.6	1.654	26.2	1.743	31.6	1.878	35.8
1.263	0.4	1.343	5.2	1.383	10.2	1.424	16	1.485	21.8	1.66	26.4	1.749	31.8	1.922	36
1.275	0.6	1.344	5.4	1.385	10.4	1.426	16.4	1.499	22	1.665	26.8	1.753	32	2.365	36.4
1.285	0.8	1.347	5.6	1.386	10.6	1.429	16.8	1.524	22.2	1.671	27	1.754	32.2	2.525	36.6
1.29	1.2	1.35	6	1.388	11	1.432	17	1.543	22.6	1.675	27.2	1.757	32.4	2.664	36.8
1.296	1.4	1.353	6.4	1.39	11.2	1.433	17.2	1.553	22.8	1.679	27.6	1.763	32.6	2.824	37
1.301	1.6	1.356	6.6	1.393	11.6	1.435	17.4	1.56	23	1.685	27.8	1.764	32.8	3.042	37.2
1.307	2	1.358	7	1.396	12	1.438	17.8	1.565	23.2	1.689	28.2	1.769	33	3.043	37.4
1.311	2.2	1.361	7.4	1.399	12.4	1.44	18.2	1.567	23.4	1.693	28.4	1.775	33.2	3.29	37.6
1.314	2.4	1.364	7.6	1.4	12.6	1.443	18.4	1.572	23.6	1.697	28.6	1.779	33.4	4.1	37.6
1.315	2.6	1.365	7.8	1.403	13	1.446	18.8	1.579	23.8	1.699	28.8	1.781	33.6		
1.318	2.8	1.367	8	1.406	13.4	1.449	19.2	1.586	24	1.703	29	1.786	33.8		
1.322	3.2	1.369	8.4	1.408	13.8	1.451	19.4	1.588	24.2	1.707	29.4	1.794	34		
1.325	3.6	1.372	8.6	1.41	14	1.454	19.6	1.594	24.4	1.711	29.6	1.801	34.2		
1.328	3.8	1.374	8.8	1.411	14.2	1.456	19.8	1.604	24.6	1.715	30	1.803	34.4		
1.329	4	1.375	9	1.413	14.4	1.458	20	1.614	24.8	1.719	30.2	1.811	34.6		
1.331	4.2	1.376	9.2	1.414	14.6	1.461	20.4	1.624	25.2	1.724	30.4	1.822	34.8		
1.333	4.4	1.378	9.4	1.415	14.8	1.465	20.6	1.632	25.4	1.729	30.8	1.833	35		
1.336	4.6	1.379	9.6	1.417	15	1.468	21	1.64	25.6	1.733	31	1.846	35.4		
1.338	4.8	1.381	9.8	1.418	15.4	1.472	21.2	1.647	26	1.739	31.4	1.86	35.6		

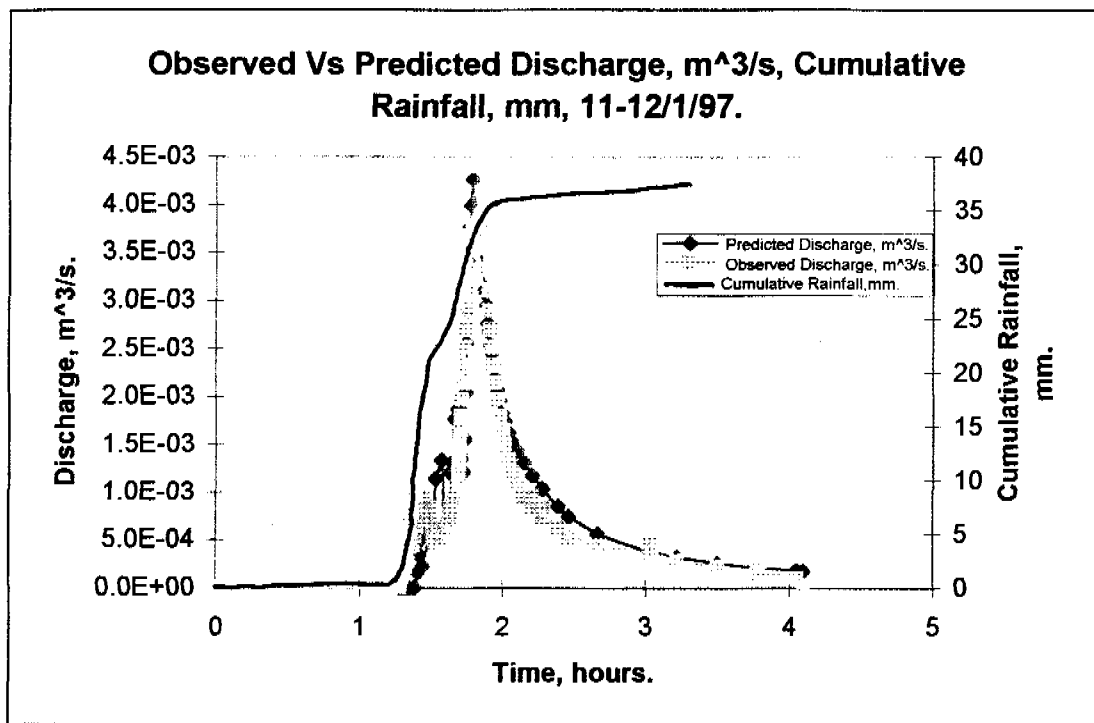
RUM 96-97 Monitoring

pit 1 site

Runoff 11-12/1/97 2200hrs

81

0	0	1.597	6.26E-04	1.776	3.54E-03	2.211	8.39E-04	4.1	0
1.281	9.97E-06	1.625	7.29E-04	1.788	3.77E-03	2.213	9.57E-04		
1.289	5.07E-05	1.643	8.39E-04	1.875	3.54E-03	2.214	8.39E-04		
1.297	9.84E-05	1.644	7.29E-04	1.876	3.77E-03	2.276	7.29E-04		
1.311	1.53E-04	1.646	8.39E-04	1.878	3.54E-03	2.278	8.39E-04		
1.326	2.14E-04	1.663	9.57E-04	1.886	3.32E-03	2.281	7.29E-04		
1.333	2.83E-04	1.686	1.08E-03	1.899	3.11E-03	2.388	6.26E-04		
1.344	3.58E-04	1.69	1.21E-03	1.906	2.90E-03	2.468	5.30E-04		
1.383	4.41E-04	1.696	1.35E-03	1.917	2.70E-03	2.663	4.41E-04		
1.392	5.30E-04	1.7	1.49E-03	1.925	2.51E-03	3.036	3.58E-04		
1.406	6.26E-04	1.704	1.65E-03	1.936	2.32E-03	3.039	4.41E-04		
1.414	7.29E-04	1.708	1.80E-03	1.951	2.14E-03	3.049	3.58E-04		
1.428	8.39E-04	1.715	1.97E-03	1.967	1.97E-03	3.218	2.83E-04		
1.442	9.57E-04	1.721	2.14E-03	1.982	1.80E-03	3.5	2.14E-04		
1.503	8.39E-04	1.726	2.32E-03	2.004	1.65E-03	3.782	1.53E-04		
1.51	7.29E-04	1.735	2.51E-03	2.017	1.49E-03	3.783	2.14E-04		
1.515	6.26E-04	1.743	2.70E-03	2.046	1.35E-03	3.785	1.53E-04		
1.521	5.30E-04	1.751	2.90E-03	2.069	1.21E-03	3.786	2.14E-04		
1.535	4.41E-04	1.761	3.11E-03	2.106	1.08E-03	3.788	1.53E-04		
1.574	5.30E-04	1.768	3.32E-03	2.153	9.57E-04	4.056	9.84E-05		



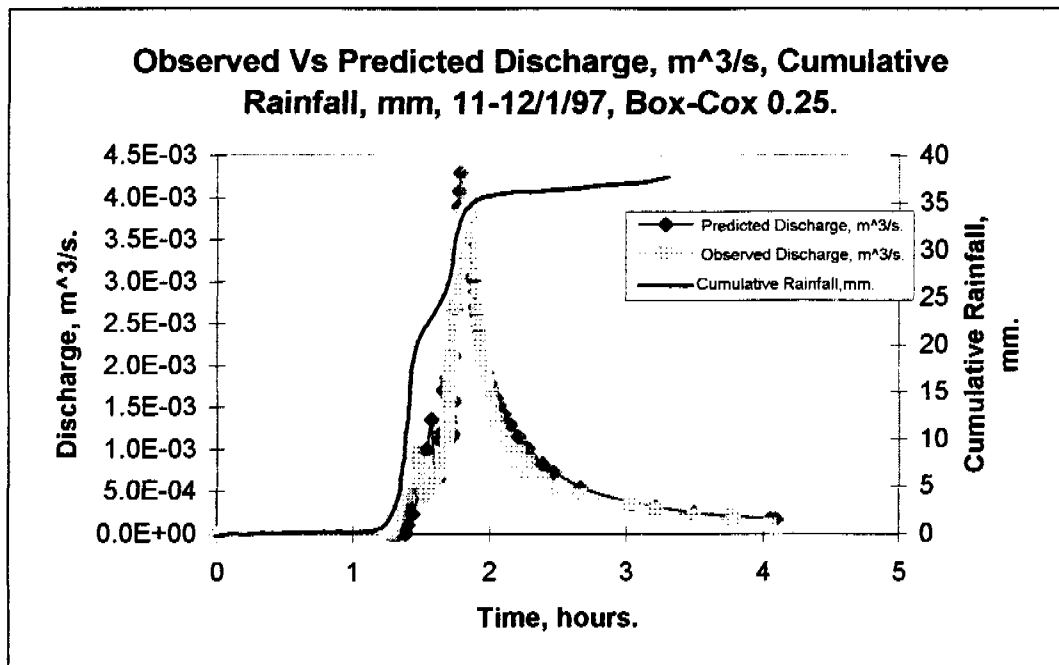
NLFIT Input files: 1112197.fw, 1112197.ro/rf.

NLFIT Output files: 1112197.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	5.68622	0.950998	$S\phi$	0.001	
e_m	4.54421	0.221561	ϕ	22.6072	1.0667

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1495	86.3	0.6687	0.2178	-6.488	0.0908	0.0991	4	4

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is not adequate 86.3%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 4 times, and the partial auto-correlation plot is exceeded 4 times.



NLFIT Input files: 1112197.fw, 1112197.ro/rf.

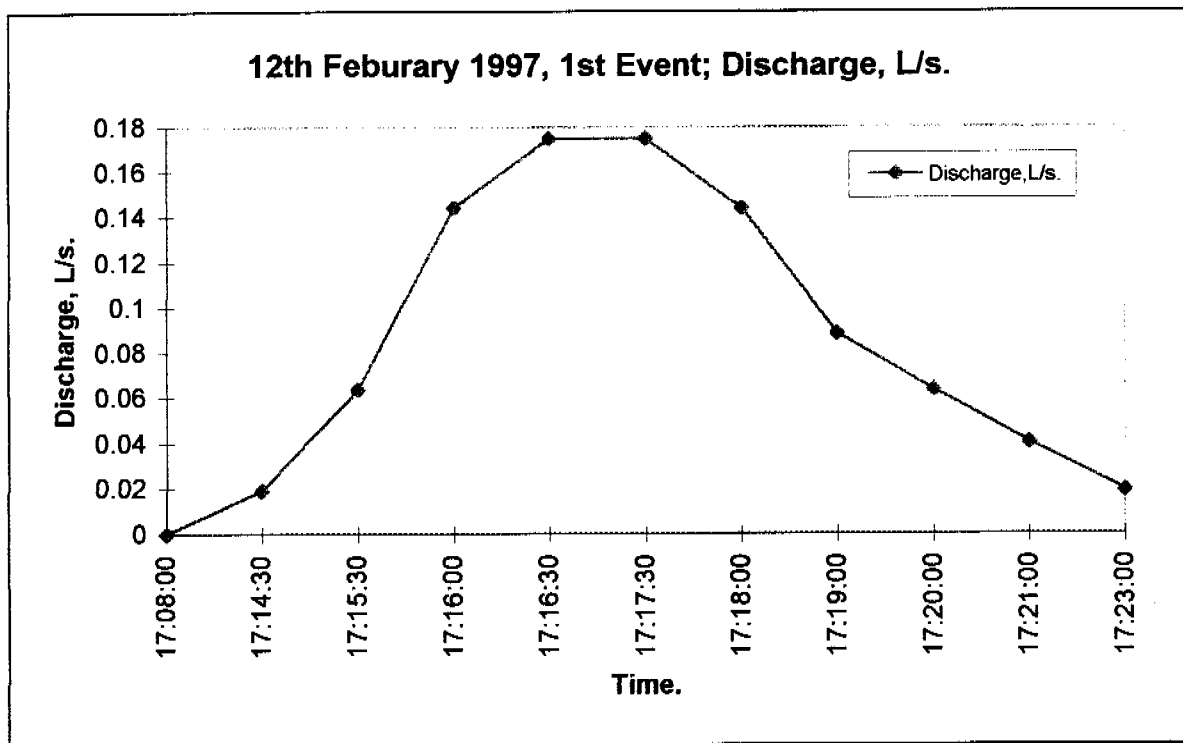
NLFIT Output files: 11197w25.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	6.88617	1.34466	$S\phi$	0.001	
e_m	4.80447	0.248375	ϕ	22.2196	1.16230

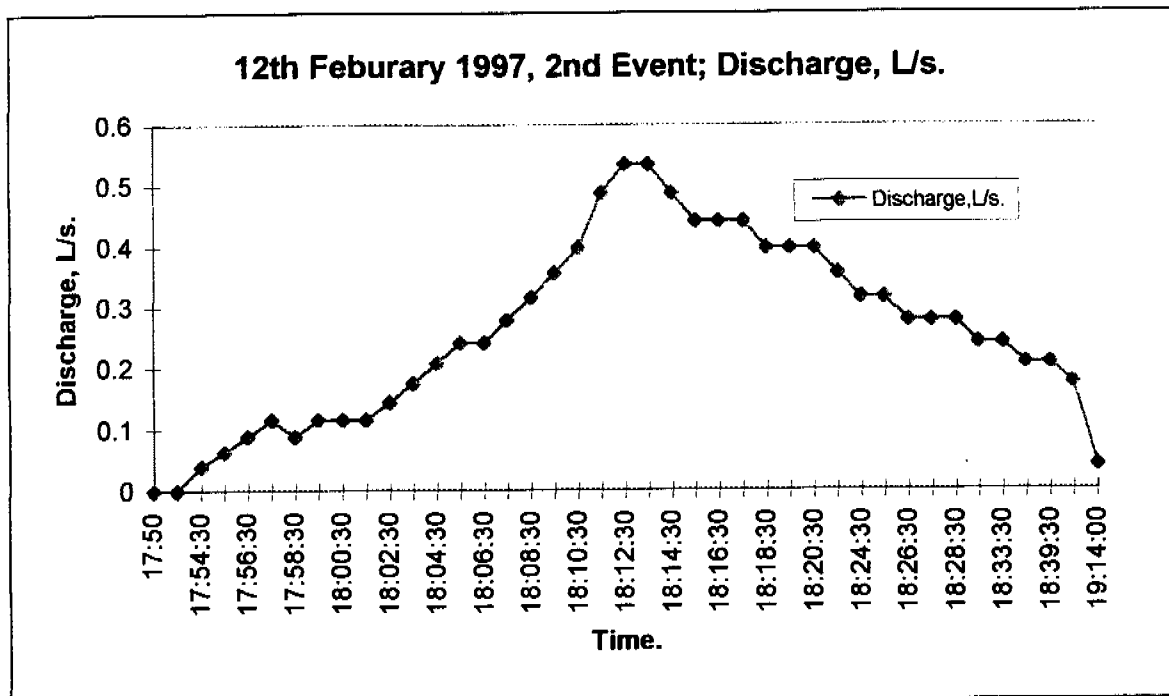
		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
Convergence Monitor.	R^2 , %.	0.6722	0.2178	-6.06	0.0864	0.0991	8	4

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 84.4%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 8 times, and the partial auto-correlation plot is exceeded 4 times.

General Comments: The original prediction, utilising a least squares error model was adequate, however, a more general error model, Box-Cox 0.25, produced the superior fit.



Storm Specific Comment: Due to failure of tipping bucket rainguage, cumulative rainfall was unavailable for this storm event.



Storm Specific Comment: Due to failure of tipping bucket rainguage, cumulative rainfall was unavailable for this storm event.

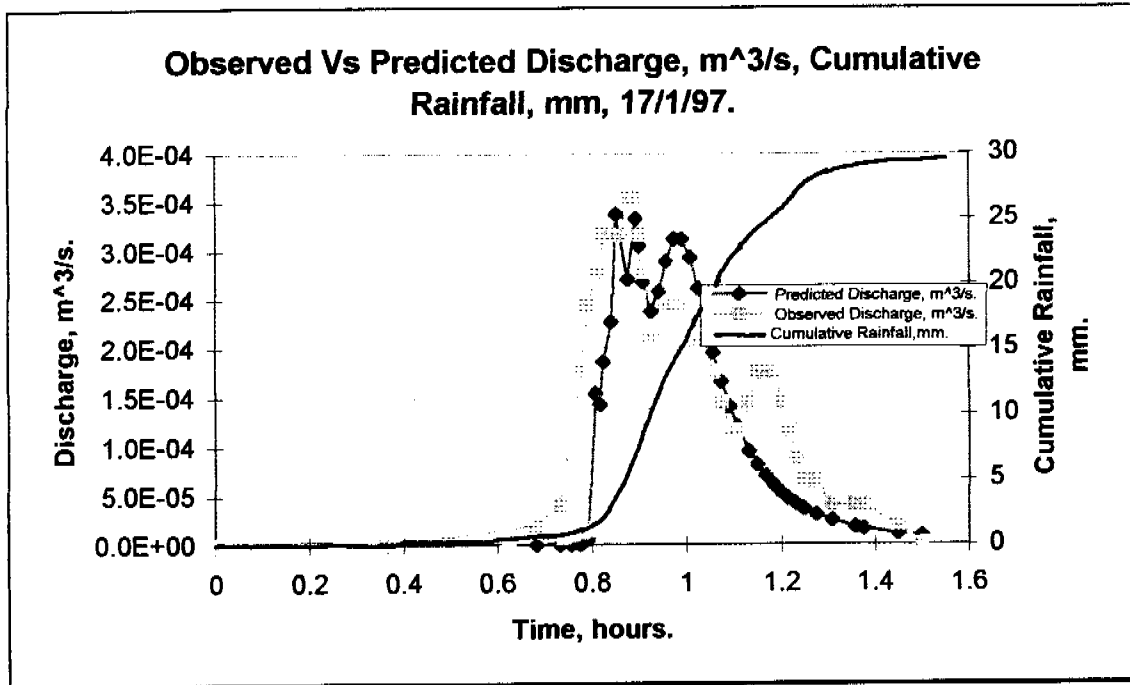
17th January

RUM 96-97 Monitoring
pit 1 site
Rainfall 17/1/97 1632hrs

0	0	0.942	18	1.45	29.6
0.367	0.2	0.958	19	1.5	29.6
0.683	0.8	0.975	20		
0.733	1.8	0.992	21		
0.758	3.4	1.008	22		
0.775	4.8	1.025	22.8		
0.783	5.6	1.042	23.4		
0.792	6	1.058	24.2		
0.8	6.8	1.075	24.4		
0.808	7.8	1.092	25.2		
0.817	8.4	1.108	25.8		
0.825	9	1.133	26.8		
0.842	10.6	1.15	27.4		
0.85	11.4	1.167	28		
0.858	12	1.183	28.2		
0.875	13.4	1.2	28.4		
0.892	14.6	1.217	28.6		
0.9	15.2	1.25	29		
0.908	15.8	1.308	29.2		
0.925	16.6	1.375	29.4		

RUM 96-97 Monitoring
pit 1 site
Runoff 17/1/97 1632hrs
43

0	0.00E+00	0.975	2.42E-04	1.375	4.06E-05
0.367	0.00E+00	0.992	2.42E-04	1.45	1.93E-05
0.683	1.93E-05	1.008	2.07E-04	1.5	0
0.733	4.06E-05	1.025	2.42E-04		
0.758	8.86E-05	1.042	2.07E-04		
0.775	1.75E-04	1.058	1.75E-04		
0.792	2.42E-04	1.075	1.44E-04		
0.808	2.78E-04	1.092	1.16E-04		
0.817	2.78E-04	1.108	1.16E-04		
0.825	3.16E-04	1.133	1.44E-04		
0.842	3.16E-04	1.15	1.75E-04		
0.85	3.16E-04	1.167	1.75E-04		
0.858	3.16E-04	1.183	1.75E-04		
0.875	3.56E-04	1.2	1.44E-04		
0.892	3.56E-04	1.217	1.16E-04		
0.9	3.16E-04	1.233	8.86E-05		
0.908	2.78E-04	1.25	6.37E-05		
0.925	2.07E-04	1.275	6.37E-05		
0.942	2.07E-04	1.308	4.06E-05		
0.958	2.42E-04	1.358	4.06E-05		



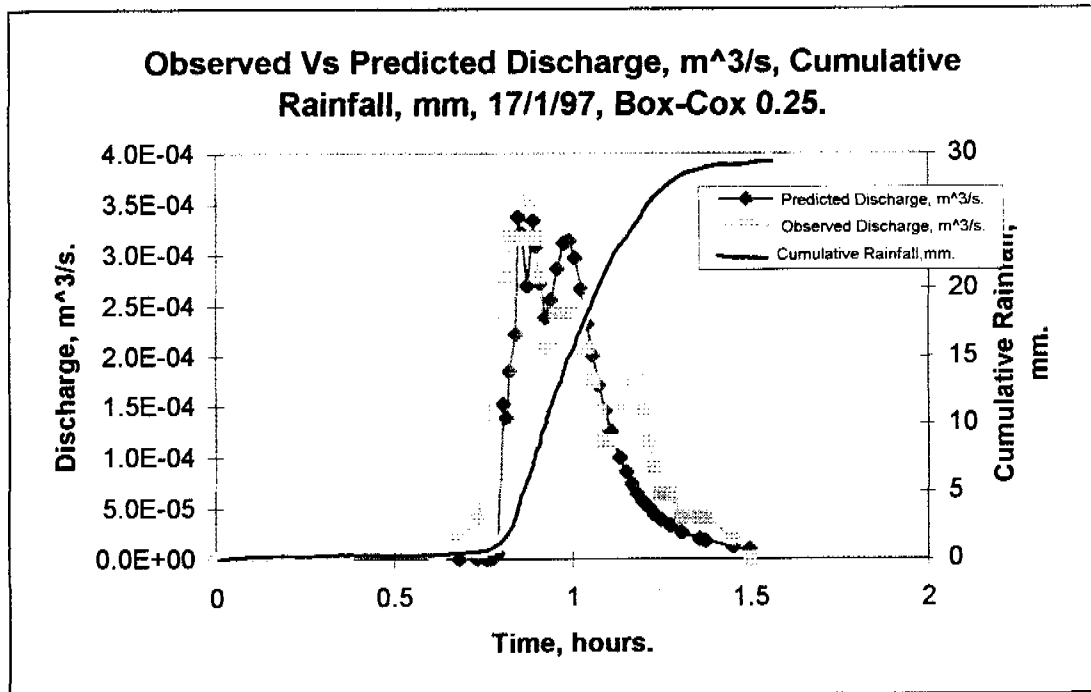
NLFIT Input files: 17197.fw, 17197.ro/rf.

NLFIT Output files: 17197w.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	7.67941	7.31717	$S\phi$	0.001	
e_m	1.42309	0.234173	ϕ	85.5677	1.59935

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
Convergence Monitor.	R^2 , %.	0.6571	0.3041	-4.79	0.1061	0.1371	9	6

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 66.4%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 9 times, and the partial auto-correlation plot is exceeded 6 times.



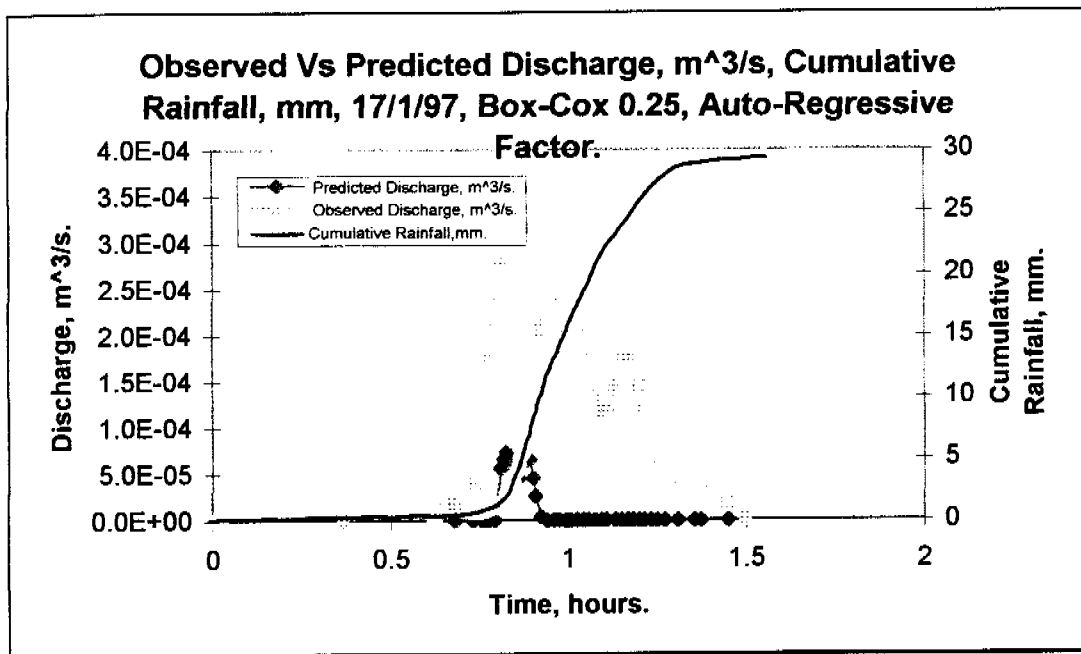
NLFIT Input files: 17197.fw, 17197.ro/rf.

NLFIT Output files: 17197w25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	8.1221	7.88141	$S\phi$	0.001	
e_m	1.44145	0.238411	ϕ	85.2681	1.6366

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.02936	65.7	0.6578	0.3041	-4.79	0.1069	0.1371	9	5

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 65.7%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 9 times, and the partial auto-correlation plot is exceeded 5 times.



NLFIT Input files: 17197.fw, 17197.ro/rf.

NLFIT Output files: 17197wa.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	2.3178	2.8068	$S\phi$	0.001	
e_m	0.94507	0.1841	ϕ	107.87	3.6323

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
Convergence Monitor.	R^2 , %.							
0.01202	49.8	0.3647	0.3041	-2.251	0.1327	0.1371	1	1

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 49.8%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 1 times, and the partial auto-correlation plot is exceeded 1 times.

General Comment: The utilisation of a more general error model with a Box Cox of 0.25, 17197w25.*, did not improve the predicted response over the general error model, 17197w. The addition of an auto-regressive factor, 17197wa.*, yielded a very poor predicted response.

19th January

RUM 96-97 Monitoring

pit 1 site

Rainfall 19/1/97 1642hrs

84

0	0	0.965	4.6	1.006	9.6	1.053	14.8	1.368	19.2
0.043	0.2	0.967	4.8	1.008	10	1.054	15	1.758	19.4
0.115	0.4	0.968	5	1.011	10.2	1.056	15.2	1.792	19.6
0.836	0.6	0.969	5.2	1.015	10.6	1.058	15.4	1.9	19.6
0.869	0.8	0.971	5.6	1.018	10.8	1.06	15.6		
0.871	1	0.974	6	1.022	11.2	1.061	15.8		
0.907	1.2	0.976	6.4	1.025	11.4	1.064	16.2		
0.933	1.4	0.979	6.6	1.028	11.8	1.067	16.4		
0.938	1.8	0.982	7	1.031	12	1.069	16.6		
0.942	2	0.985	7.4	1.032	12.2	1.071	16.8		
0.944	2.2	0.988	7.6	1.033	12.4	1.081	17		
0.946	2.4	0.99	7.8	1.036	12.8	1.088	17.2		
0.949	2.8	0.992	8	1.039	13	1.1	17.4		
0.951	3	0.993	8.2	1.04	13.2	1.114	17.8		
0.953	3.2	0.994	8.4	1.042	13.4	1.135	18		
0.954	3.4	0.997	8.6	1.043	13.6	1.165	18.2		
0.957	3.6	0.999	8.8	1.044	13.8	1.185	18.4		
0.958	3.8	1	9	1.047	14.2	1.219	18.6		
0.961	4.2	1.001	9.2	1.05	14.4	1.221	18.8		
0.964	4.4	1.003	9.4	1.051	14.6	1.251	19		

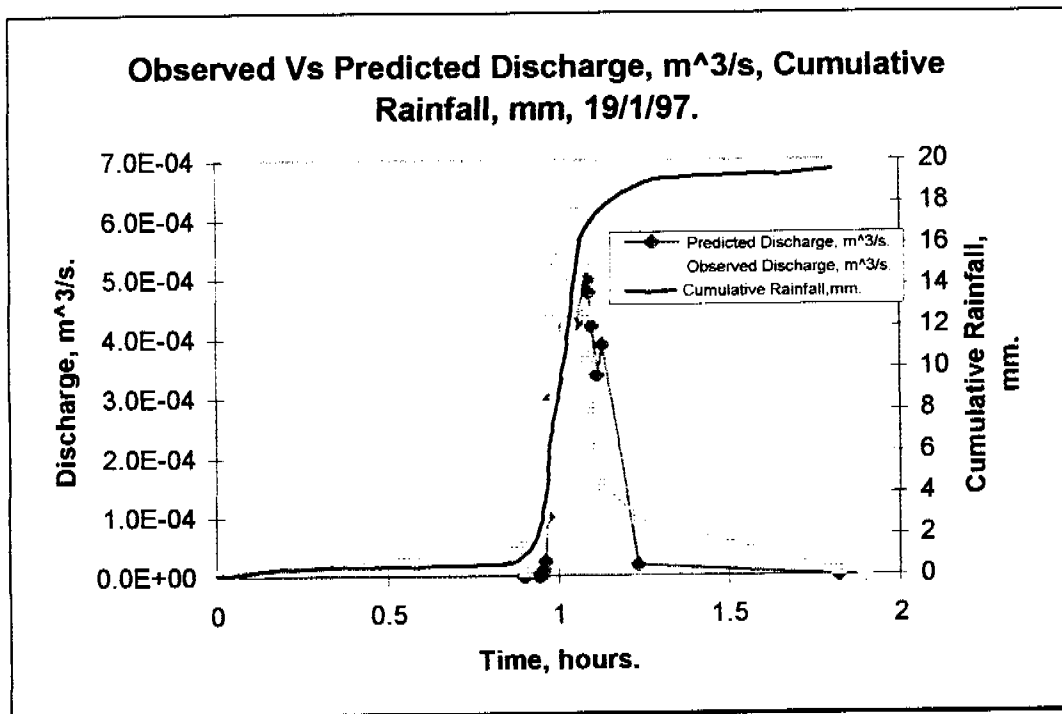
RUM 96-97 Monitoring

pit 1 site

Runoff 19/1/97 1642hrs

23

0	0	1.236	9.84E-05
0.899	5.07E-05	1.822	9.97E-06
0.906	9.97E-06	1.9	0
0.907	5.07E-05		
0.942	9.84E-05		
0.951	1.53E-04		
0.958	2.14E-04		
0.963	2.83E-04		
0.969	3.58E-04		
0.976	4.41E-04		
0.983	5.30E-04		
1.025	4.41E-04		
1.026	5.30E-04		
1.054	6.26E-04		
1.079	5.30E-04		
1.086	4.41E-04		
1.092	3.58E-04		
1.1	2.83E-04		
1.115	2.14E-04		
1.131	1.53E-04		



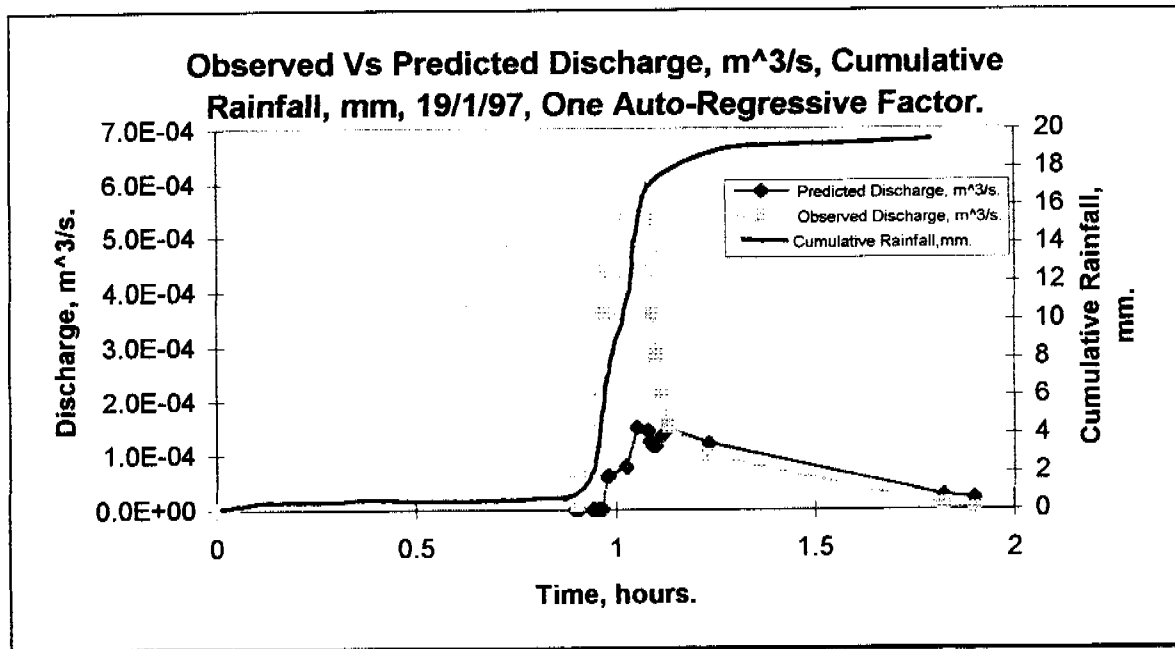
NLFIT Input files: 19197.fw, 19197.ro/rf.

NLFIT Output files: 19197.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.46137	0.364846	$S\phi$	0.001	
e_m	0.72775	0.18173	ϕ	133.278	3.13251

Convergence Monitor.	R^2 , %.	Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.2723	58.3	0.6221	0.4301	-3.539	0.102	0.1881	4	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 58.3%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 4 times, and the partial auto-correlation plot is exceeded 2 times.



NLFIT Input files: 19197.fw, 19197.ro/rf.

NLFIT Output files: 19197ar1.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	20.3043	74.4625	$S\phi$	0.001	
e_m	1.8244	0.951322	ϕ	135.641	13.0241

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.3388	15.2	0.4567	0.4301	-1.723	0.133	0.1841	3	3

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 15.2%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 3 times, and the partial auto-correlation plot is exceeded 3 times.

General Comments: 19197.* was a relatively poor fit as the inclination and recession limbs are under-predicted, the immediate addition of an auto-regressive factor worsened the predicted response considerably, 19197ar1.*.

21st January 1st Event

RUM 96-97 Monitoring

pit 1 site

Rainfall 21/1/97 1529hrs

51

0	0	0.267	4.6	0.333	9.6
0.063	0.2	0.271	4.8	0.339	9.8
0.088	0.4	0.275	5.2	0.349	10.2
0.089	0.6	0.279	5.4	0.354	10.4
0.131	0.8	0.283	5.6	0.36	10.8
0.199	1	0.285	5.8	0.364	11
0.215	1.2	0.288	6	0.372	11.2
0.221	1.4	0.292	6.4	0.382	11.6
0.222	1.6	0.294	6.6	0.4	11.8
0.228	1.8	0.297	7	0.431	12
0.233	2	0.3	7.2	0.77	12
0.235	2.2	0.304	7.6		
0.236	2.4	0.307	7.8		
0.24	2.8	0.311	8.2		
0.243	3	0.314	8.4		
0.247	3.2	0.318	8.6		
0.249	3.4	0.319	8.8		
0.253	3.6	0.324	9		
0.257	4	0.328	9.2		
0.263	4.2	0.329	9.4		

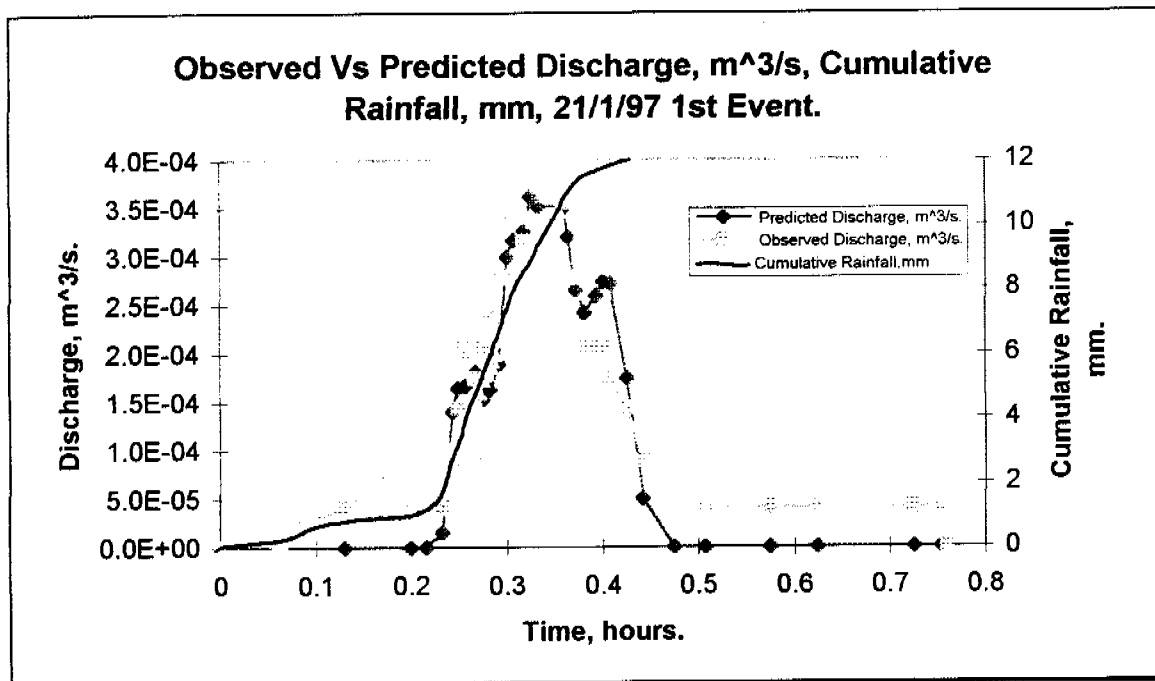
RUM 96-97 Monitoring

pit 1 site

Runoff 21/1/97 1529hrs

33

0	0.00E+00	0.382	2.07E-04
0.131	4.06E-05	0.393	2.07E-04
0.199	4.06E-05	0.4	2.07E-04
0.215	4.06E-05	0.408	1.75E-04
0.233	4.06E-05	0.425	1.44E-04
0.243	8.86E-05	0.442	8.86E-05
0.249	1.44E-04	0.475	6.37E-05
0.257	2.07E-04	0.508	4.06E-05
0.267	1.75E-04	0.575	4.06E-05
0.275	2.07E-04	0.625	4.06E-05
0.283	2.42E-04	0.725	4.06E-05
0.292	2.78E-04	0.754	4.06E-05
0.3	2.78E-04	0.76	0
0.307	2.78E-04		
0.318	3.16E-04		
0.325	3.98E-04		
0.333	3.98E-04		
0.36	3.98E-04		
0.364	3.56E-04		
0.372	2.78E-04		



NLFIT Input files: 211971ma.fw, 211971ma.ro/rf.

NLFIT Output files: 211971ma.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	1.40487	0.43596	$S\phi$	0.001	
e_m	0.89214	0.05896	ϕ	86.88	0.8426

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.02709	88.5	0.5371	0.3512	-2.479	0.2330	0.1567	4	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 88.5%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of [2], the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 4 times, and the partial auto-correlation plot is exceeded 2 times.

General Comment: 211971ma.* has a predicted response that is adequate compared to that which is observed, major problems exist in the areas of the inclination and recession. The centre section is not precisely predicted by the model.

21st January 2nd Event

RUM 96-97 Monitoring

pit 1 site

Rainfall 21/1/97 1658hrs

94

0	0	0.083	5	0.14	11	0.2	16.8	0.525	21.2
0.007	0.2	0.086	5.2	0.142	11.2	0.207	17	0.596	21.4
0.015	0.4	0.09	5.6	0.144	11.6	0.208	17.2	0.719	21.6
0.024	0.8	0.093	5.8	0.147	11.8	0.214	17.4	0.721	21.8
0.031	1	0.096	6.2	0.15	12.2	0.221	17.6	0.942	22
0.038	1.2	0.1	6.6	0.153	12.6	0.228	17.8	1.099	22.2
0.043	1.6	0.103	6.8	0.156	12.8	0.229	18	1.417	22.4
0.049	1.8	0.106	7.2	0.158	13.2	0.236	18.2	1.526	22.8
0.051	2.2	0.108	7.4	0.161	13.4	0.244	18.4	1.632	23
0.054	2.4	0.11	7.6	0.163	13.6	0.256	18.8	1.714	23.2
0.058	2.8	0.113	7.8	0.165	13.8	0.269	19	1.789	23.4
0.061	3	0.115	8.2	0.168	14.2	0.282	19.2	1.84	23.8
0.064	3.4	0.118	8.4	0.171	14.6	0.294	19.4	1.85	24.6
0.067	3.6	0.121	8.8	0.174	14.8	0.306	19.8	1.9	24.6
0.068	3.8	0.125	9	0.178	15.2	0.321	20		
0.071	4	0.128	9.4	0.182	15.4	0.338	20.2		
0.074	4.2	0.131	9.8	0.185	15.8	0.369	20.4		
0.075	4.4	0.133	10.2	0.188	16	0.404	20.6		
0.079	4.6	0.136	10.6	0.19	16.4	0.406	20.8		
0.082	4.8	0.138	10.8	0.194	16.6	0.465	21		

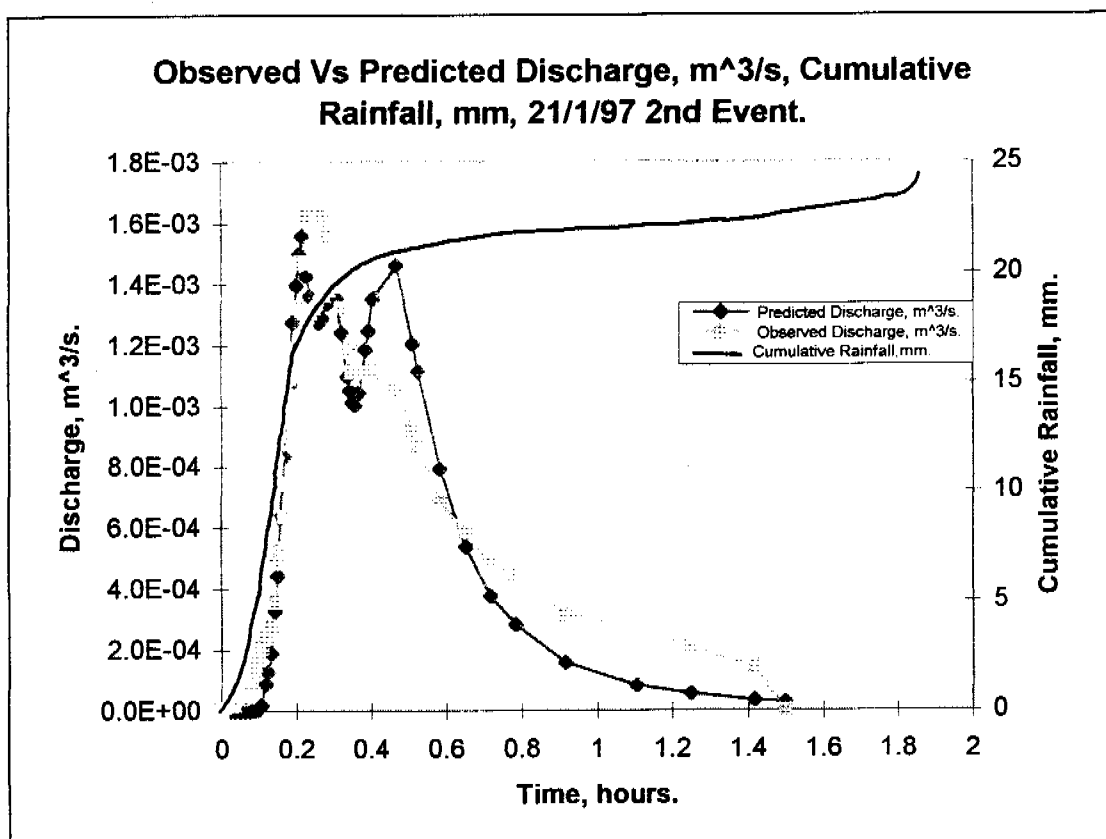
RUM 96-97 Monitoring

pit 1 site

Runoff 21/1/97 1658hrs

72

0	0.00E+00	0.294	1.08E-03	0.464	8.39E-04	0.908	2.83E-04
0.036	9.97E-06	0.336	9.57E-04	0.467	9.57E-04	0.91	3.58E-04
0.044	5.07E-05	0.338	1.08E-03	0.468	8.39E-04	0.911	2.83E-04
0.064	9.84E-05	0.339	9.57E-04	0.511	7.29E-04	0.915	3.58E-04
0.074	1.53E-04	0.342	1.08E-03	0.513	8.39E-04	0.917	2.83E-04
0.103	2.14E-04	0.343	9.57E-04	0.514	7.29E-04	1.103	2.14E-04
0.11	2.83E-04	0.344	1.08E-03	0.579	6.26E-04	1.25	1.53E-04
0.118	3.58E-04	0.346	9.57E-04	0.581	7.29E-04	1.256	2.14E-04
0.125	4.41E-04	0.347	1.08E-03	0.583	6.26E-04	1.257	1.53E-04
0.135	5.30E-04	0.349	9.57E-04	0.651	5.30E-04	1.842	2.14E-04
0.14	6.26E-04	0.35	1.08E-03	0.653	6.26E-04	1.856	1.53E-04
0.15	7.29E-04	0.351	9.57E-04	0.654	5.30E-04	1.9	0
0.154	8.39E-04	0.356	1.08E-03	0.656	6.26E-04		
0.161	9.57E-04	0.357	9.57E-04	0.657	5.30E-04		
0.172	1.08E-03	0.386	1.08E-03	0.658	6.26E-04		
0.178	1.21E-03	0.388	9.57E-04	0.66	5.30E-04		
0.19	1.35E-03	0.39	1.08E-03	0.714	4.41E-04		
0.196	1.49E-03	0.392	9.57E-04	0.715	5.30E-04		
0.243	1.35E-03	0.403	1.08E-03	0.717	4.41E-04		
0.263	1.21E-03	0.404	9.57E-04	0.785	3.58E-04		



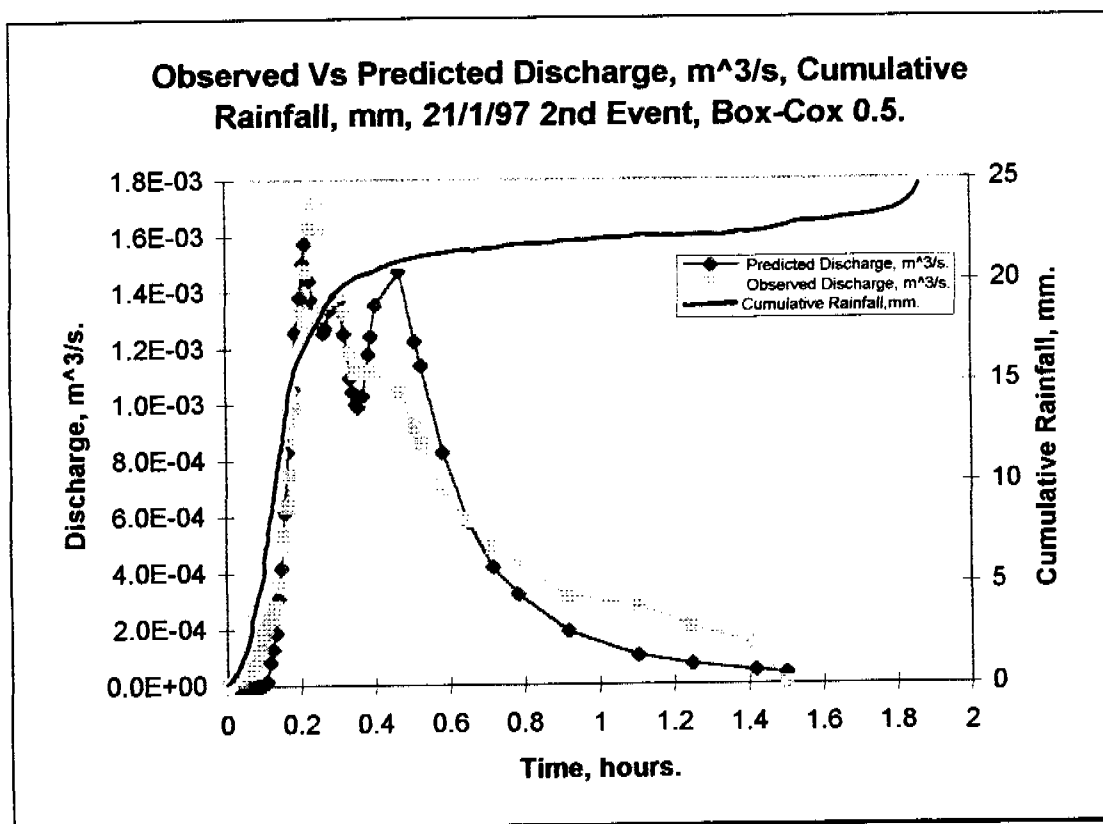
NLFIT Input files: 211972ma.fw, 211972ma.ro/rf

NLFIT Output files: 211972ma.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	1.92171	0.4953	$S\phi$	15.1560	7.45779
e_m	1.4351	0.155761	ϕ	8.37335	26.733

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.198951	90.3	0.7105	0.272	-5.659	0.1378	0.1223	13	6

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 90.3%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 13 times, and the partial auto-correlation plot is exceeded 6 times.

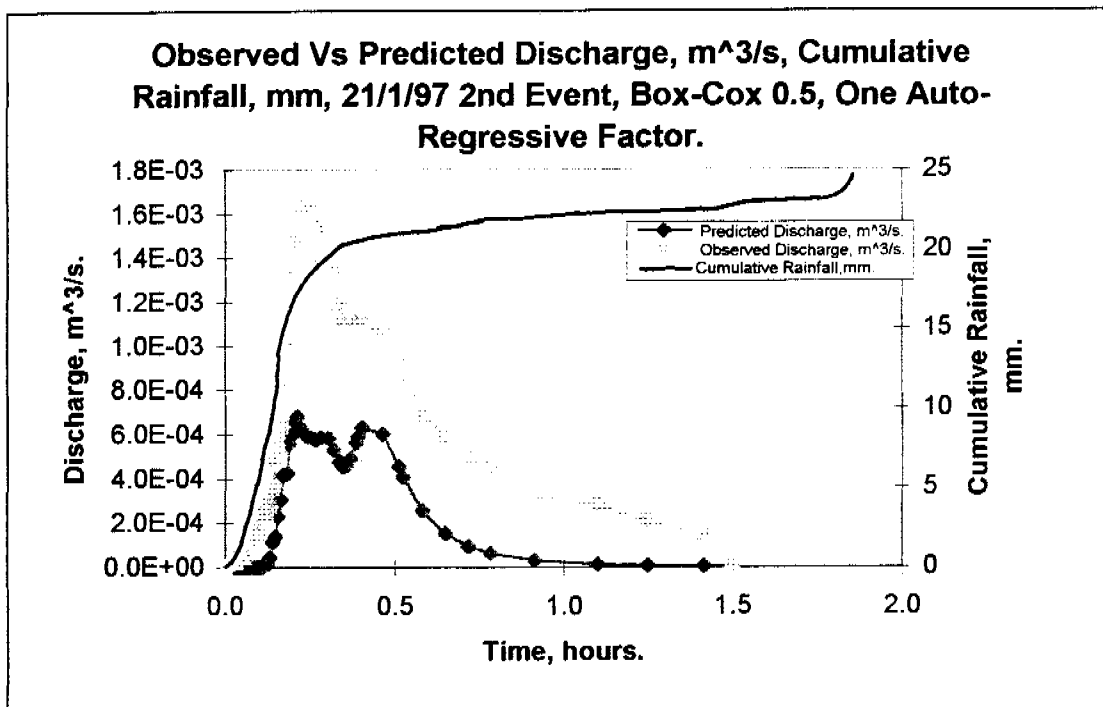


NLFIT Input files: 211972ma.fw, 211972ma.ro/rf
 NLFIT Output files: 211972m5.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	2.16115	0.53374	$S\phi$	14.9971	8.21074
e_m	1.51277	0.1533003	ϕ	7.54384	29.6416

Convergence Monitor.	R^2 , %.	Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus $N(0,1)$ Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.140712	90.1	0.7019	0.272	-5.659	0.1249	0.1223	12	4

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 90.1%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of |2|, the standardised residual versus $N(0,1)$ variate does pass the test statistic. The auto-correlation plot is exceeded 12 times, and the partial auto-correlation plot is exceeded 4 times.



NLFIT Input files: 211972ma.fw, 211972ma.ro/rf

NLFIT Output files: 2119725a.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	1.98791	0.80197	$S\phi$	17.8263	14.7934
e_m	1.26774	0.15133	ϕ	18.9524	52.6817

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.647961	90.9	0.3036	0.272	-3.057	0.1606	0.1223	3	2

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 90.9%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 3 times, and the partial auto-correlation plot is exceeded 2 times.

General Comment: There is little improvement in the predicted response between the least squares error model, 211972ma.*, and 211972m5.*, ie with a Box-Cox factor of 0.5. The addition of an auto-regressive factor deteriorates the predicted response, 2119725a.*.

22nd January

RUM 96-97 Monitoring

pit 1 site

Rainfall 22/1/97 1441hrs

135

0	0	0.164	4.4	1.328	9	2.357	14	2.869	18.6	3.686	23.2	4.49	28
0.008	0.4	1.074	4.6	1.333	9.4	2.363	14.2	2.926	18.8	3.713	23.6	4.528	28.2
0.026	0.6	1.146	5	1.34	9.6	2.364	14.4	2.943	19	3.744	23.8	4.568	28.4
0.029	0.8	1.2	5.2	1.346	9.8	2.374	14.6	2.961	19.2	3.786	24	4.636	28.6
0.036	1	1.225	5.4	1.353	10.2	2.383	14.8	2.963	19.4	3.822	24.2	4.728	29
0.042	1.2	1.256	5.6	1.36	10.4	2.394	15	2.992	19.6	3.856	24.4	4.829	29.2
0.049	1.4	1.267	5.8	1.368	10.6	2.413	15.4	3.06	19.8	3.892	24.8	4.969	29.4
0.05	1.6	1.268	6	1.378	11	2.426	15.6	3.128	20	3.925	25	5.099	29.6
0.064	1.8	1.274	6.2	1.389	11.2	2.446	15.8	3.182	20.4	3.968	25.2	5.257	29.8
0.079	2	1.279	6.6	1.396	11.4	2.461	16	3.232	20.6	4.017	25.4	5.378	30
0.09	2.2	1.285	6.8	1.404	11.6	2.472	16.4	3.278	20.8	4.068	25.8	5.379	30.2
0.092	2.4	1.29	7	1.406	11.8	2.482	16.6	3.321	21	4.101	26	5.651	30.4
0.1	2.6	1.296	7.2	1.419	12	2.496	16.8	3.369	21.2	4.132	26.2	5.94	30.6
0.108	2.8	1.297	7.4	2.161	12.2	2.515	17	3.421	21.6	4.175	26.4	6.471	30.8
0.118	3	1.301	7.6	2.278	12.4	2.538	17.2	3.458	21.8	4.238	26.6	8.2	30.8
0.119	3.2	1.307	8	2.294	12.8	2.539	17.4	3.497	22	4.3	26.8		
0.131	3.4	1.313	8.2	2.315	13	2.554	17.6	3.538	22.2	4.301	27		
0.136	3.6	1.318	8.4	2.331	13.2	2.575	17.8	3.576	22.6	4.353	27.2		
0.142	4	1.322	8.6	2.339	13.6	2.625	18	3.615	22.8	4.396	27.4		
0.149	4.2	1.324	8.8	2.349	13.8	2.736	18.4	3.649	23	4.446	27.6		

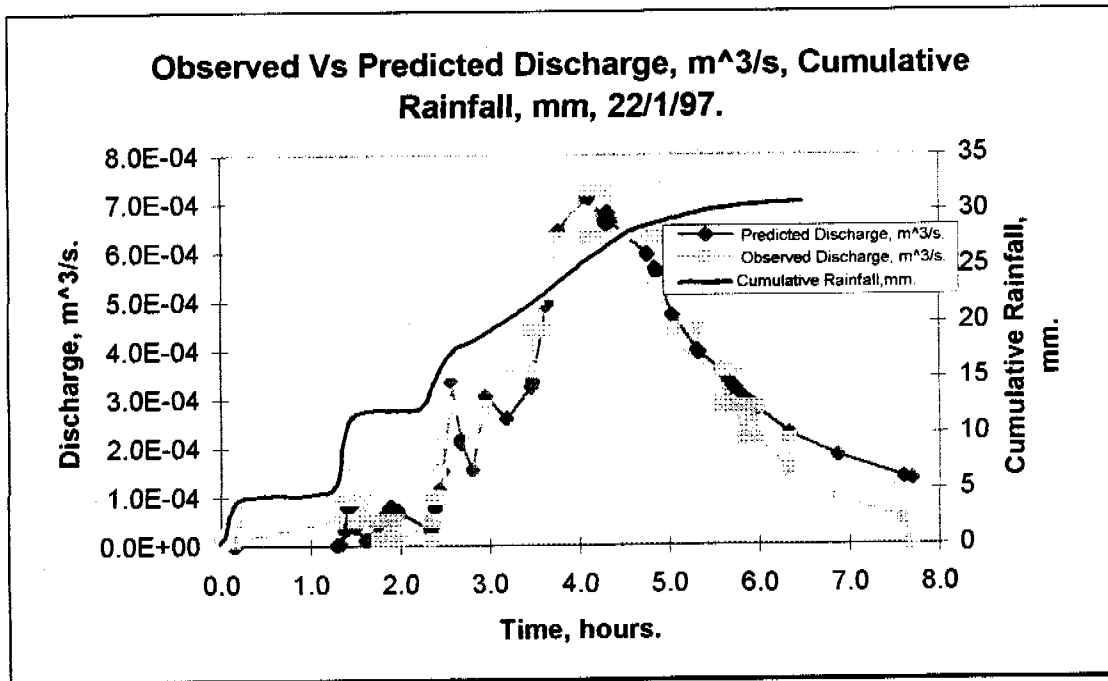
RUM 96-97 Monitoring

pit 1 site

Runoff 22/1/97 1441hrs

166

0	0.00E+00	1.618	9.84E-05	2.338	9.97E-06	2.679	3.58E-04	4.108	7.29E-04	4.34	7.29E-04	5.315	3.58E-04	5.735	3.58E-04	7.606	9.84E-05
0.039	9.97E-06	1.621	5.07E-05	2.342	5.07E-05	2.681	2.83E-04	4.11	6.26E-04	4.342	6.26E-04	5.317	4.41E-04	5.738	2.83E-04	7.608	5.07E-05
0.151	5.07E-05	1.625	9.84E-05	2.343	9.97E-06	2.807	2.14E-04	4.111	7.29E-04	4.343	7.29E-04	5.326	3.58E-04	5.833	2.14E-04	7.642	9.84E-05
0.158	9.97E-06	1.628	5.07E-05	2.351	5.07E-05	2.946	2.83E-04	4.283	6.26E-04	4.344	6.26E-04	5.328	4.41E-04	5.849	2.83E-04	7.643	5.07E-05
1.282	5.07E-05	1.76	9.97E-06	2.353	9.97E-06	3.19	3.58E-04	4.286	7.29E-04	4.35	7.29E-04	5.329	3.58E-04	5.85	2.14E-04	8.193	9.97E-06
1.301	9.84E-05	1.771	5.07E-05	2.354	5.07E-05	3.469	4.41E-04	4.29	6.26E-04	4.75	6.26E-04	5.332	4.41E-04	5.925	2.83E-04	8.2	0
1.332	1.53E-04	1.775	9.97E-06	2.356	9.97E-06	3.471	3.58E-04	4.292	7.29E-04	4.751	7.29E-04	5.333	3.58E-04	5.929	2.14E-04		
1.374	9.84E-05	1.783	5.07E-05	2.357	5.07E-05	3.486	4.41E-04	4.293	6.26E-04	4.76	6.26E-04	5.335	4.41E-04	5.931	2.83E-04		
1.407	1.53E-04	1.785	9.97E-06	2.364	9.84E-05	3.489	3.58E-04	4.297	7.29E-04	4.843	5.30E-04	5.338	3.58E-04	5.932	2.14E-04		
1.408	9.84E-05	1.789	5.07E-05	2.389	1.53E-04	3.49	4.41E-04	4.299	6.26E-04	4.844	6.26E-04	5.339	4.41E-04	5.954	2.83E-04		
1.457	9.84E-05	1.79	9.97E-06	2.392	9.84E-05	3.635	5.30E-04	4.3	7.29E-04	4.846	5.30E-04	5.34	3.58E-04	5.972	2.14E-04		
1.49	5.07E-05	1.799	5.07E-05	2.425	1.53E-04	3.638	4.41E-04	4.301	6.26E-04	4.847	6.26E-04	5.583	2.83E-04	5.974	2.83E-04		
1.492	9.84E-05	1.8	9.97E-06	2.428	9.84E-05	3.639	5.30E-04	4.306	7.29E-04	4.857	5.30E-04	5.589	3.58E-04	5.975	2.14E-04		
1.493	5.07E-05	1.878	5.07E-05	2.431	1.53E-04	3.64	4.41E-04	4.307	6.26E-04	4.86	6.26E-04	5.59	2.83E-04	6.338	1.53E-04		
1.494	9.84E-05	1.889	9.97E-06	2.476	2.14E-04	3.661	5.30E-04	4.311	7.29E-04	4.865	5.30E-04	5.628	3.58E-04	6.339	2.14E-04		
1.5	5.07E-05	1.907	5.07E-05	2.544	2.83E-04	3.747	6.26E-04	4.314	6.26E-04	5.046	4.41E-04	5.629	2.83E-04	6.343	1.53E-04		
1.503	9.84E-05	1.908	9.97E-06	2.569	3.58E-04	3.75	5.30E-04	4.315	7.29E-04	5.047	5.30E-04	5.632	3.58E-04	6.871	9.84E-05		
1.504	5.07E-05	1.972	5.07E-05	2.675	2.83E-04	3.765	6.26E-04	4.317	6.26E-04	5.049	4.41E-04	5.669	2.83E-04	6.872	1.53E-04		
1.615	9.84E-05	1.974	9.97E-06	2.676	3.58E-04	4.089	7.29E-04	4.325	7.29E-04	5.05	5.30E-04	5.707	3.58E-04	6.875	9.84E-05		
1.617	5.07E-05	2.336	5.07E-05	2.678	2.83E-04	4.09	6.26E-04	4.326	6.26E-04	5.051	4.41E-04	5.733	2.83E-04	7.604	5.07E-05		



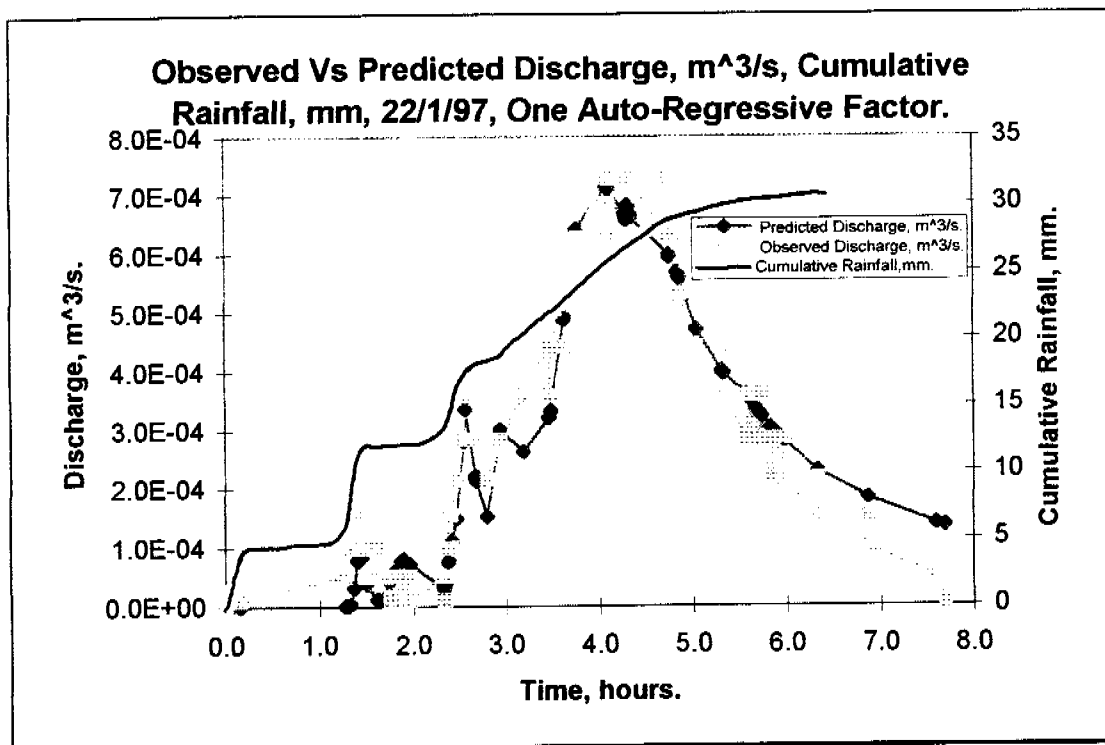
NLFIT Input files: 22197.fw, 22197.ro/rf

NLFIT Output files: 22197.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	2.16115	0.53374	$S\phi$	14.9971	8.21074
e_m	1.51277	0.1533003	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.04104	94.5	0.3356	0.153	0.509	0.0881	0.0704	6	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 94.5%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 6 times, and the partial auto-correlation plot is exceeded 2 times.



NLFIT Input files: 22197.fw, 22197.ro/rf

NLFIT Output files: 22197a.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	1.8182	0.2208	$S\phi$	2.5737	0.0699
e_m	3.8905	0.1019	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.0560	94.4	0.2586	0.153	3.493	0.1064	0.0704	5	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 94.4%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 5 times, and the partial auto-correlation plot is exceeded 2 times.

General Comment: The addition of an auto-regressive factor, 22197a.*, to 22197.*, did not improve the predicted response over the least squares model. The statistical tests indicate that the addition of the auto-regressive factor has worsened the normality of the predicted response.

23rd January

RUM 96-97 Monitoring

pit 1 site

Rainfall 23/1/97 1617hrs

154

0	0	0.085	4.8	0.157	10.4	0.207	15.8	0.257	22.8	0.307	29.8	0.351	35.6	0.426	40.6
0.01	0.2	0.089	5	0.16	10.8	0.21	16.2	0.26	23.2	0.31	30	0.353	35.8	0.431	40.8
0.017	0.4	0.096	5.4	0.163	11	0.213	16.6	0.263	23.6	0.311	30.2	0.354	36	0.438	41.2
0.019	0.6	0.103	5.6	0.165	11.4	0.215	17	0.265	23.8	0.313	30.6	0.357	36.4	0.44	41.6
0.021	0.8	0.11	5.8	0.168	11.6	0.218	17.4	0.268	24	0.314	31	0.36	36.6	0.444	41.8
0.024	1	0.115	6	0.171	11.8	0.221	17.6	0.269	24.2	0.315	31.4	0.361	36.8	0.454	42
0.026	1.2	0.117	6.2	0.172	12	0.224	18	0.271	24.4	0.318	31.6	0.363	37	0.465	42.4
0.028	1.4	0.121	6.4	0.174	12.2	0.226	18.2	0.272	24.6	0.321	32	0.364	37.2	0.483	42.6
0.032	1.6	0.125	6.8	0.175	12.4	0.228	18.4	0.275	25.4	0.324	32.4	0.365	37.4	0.549	42.8
0.036	1.8	0.128	7	0.176	12.6	0.229	18.6	0.276	25.8	0.326	32.6	0.367	37.6	0.6	43
0.04	2.2	0.131	7.2	0.181	13	0.232	19	0.279	26.2	0.329	32.8	0.369	37.8	0.703	43.4
0.044	2.4	0.132	7.4	0.183	13.4	0.235	19.4	0.282	26.6	0.331	33	0.375	38.4	0.892	43.6
0.049	2.8	0.135	7.8	0.186	13.6	0.238	20.6	0.285	27	0.333	33.2	0.383	38.6	1.438	43.8
0.054	3	0.138	8	0.189	13.8	0.24	20.8	0.288	27.2	0.336	33.4	0.392	38.8	2.6	43.8
0.058	3.4	0.14	8.4	0.19	14	0.243	21.2	0.29	27.6	0.338	33.6	0.397	39		
0.064	3.6	0.143	8.8	0.193	14.2	0.246	21.6	0.293	28	0.34	33.8	0.399	39.2		
0.071	3.8	0.146	9	0.196	14.6	0.249	21.8	0.296	28.4	0.343	34.2	0.404	39.6		
0.072	4	0.149	9.4	0.199	14.8	0.251	22.2	0.299	28.6	0.346	34.4	0.411	39.8		
0.075	4.2	0.151	9.8	0.201	15.2	0.254	22.4	0.301	29	0.349	34.6	0.417	40.2		
0.079	4.6	0.154	10	0.204	15.6	0.256	22.6	0.304	29.4	0.35	35.4	0.424	40.4		

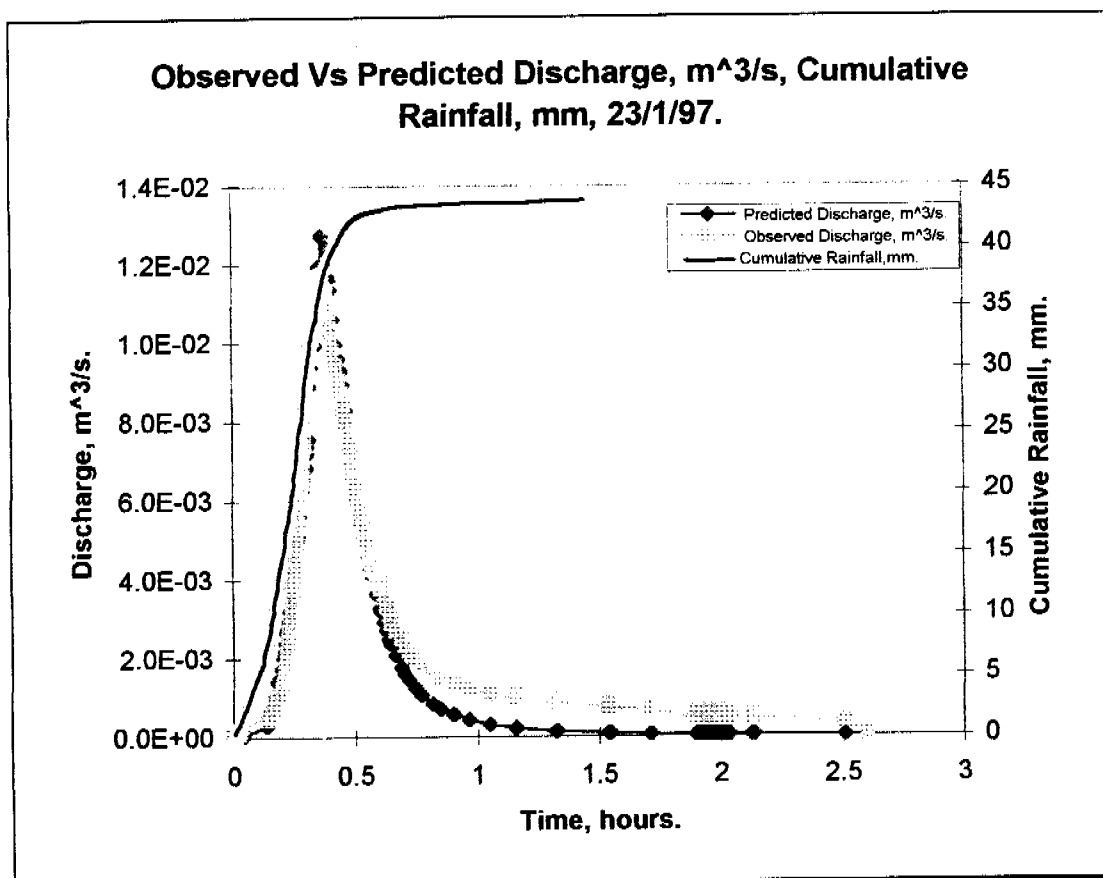
RUM 96-97 Monitoring

pit 1 site

Runoff 23/1/97 1617hrs

156

0	0.00E+00	0.219	2.14E-03	0.289	7.05E-03	0.435	9.06E-03	0.603	3.77E-03	1.16	9.57E-04	1.919	5.30E-04	1.99	4.41E-04
0.014	5.07E-05	0.224	2.32E-03	0.292	7.37E-03	0.447	8.71E-03	0.615	3.54E-03	1.164	1.08E-03	1.921	6.26E-04	1.992	5.30E-04
0.024	9.84E-05	0.225	2.51E-03	0.293	7.69E-03	0.454	8.36E-03	0.625	3.32E-03	1.165	9.57E-04	1.926	5.30E-04	1.994	6.26E-04
0.029	1.53E-04	0.228	2.70E-03	0.296	8.03E-03	0.465	8.03E-03	0.636	3.11E-03	1.324	8.39E-04	1.929	6.26E-04	1.996	5.30E-04
0.035	2.14E-04	0.233	2.90E-03	0.3	8.36E-03	0.474	7.69E-03	0.638	3.32E-03	1.325	9.57E-04	1.932	5.30E-04	2.008	4.41E-04
0.036	2.83E-04	0.238	3.11E-03	0.304	8.71E-03	0.481	7.37E-03	0.639	3.11E-03	1.329	8.39E-04	1.933	6.26E-04	2.01	5.30E-04
0.039	3.58E-04	0.239	3.32E-03	0.307	9.06E-03	0.486	7.05E-03	0.644	2.90E-03	1.538	7.29E-04	1.936	4.41E-04	2.028	6.26E-04
0.138	4.41E-04	0.242	3.54E-03	0.311	9.42E-03	0.492	6.74E-03	0.663	2.70E-03	1.539	8.39E-04	1.939	6.26E-04	2.029	4.41E-04
0.15	5.30E-04	0.243	3.77E-03	0.318	9.79E-03	0.499	6.43E-03	0.686	2.51E-03	1.542	7.29E-04	1.94	4.41E-04	2.032	5.30E-04
0.157	6.26E-04	0.25	4.01E-03	0.325	1.02E-02	0.507	6.14E-03	0.701	2.32E-03	1.547	8.39E-04	1.942	6.26E-04	2.036	4.41E-04
0.164	7.29E-04	0.253	4.25E-03	0.34	1.05E-02	0.513	5.85E-03	0.717	2.14E-03	1.549	7.29E-04	1.951	5.30E-04	2.038	5.30E-04
0.171	8.39E-04	0.257	4.50E-03	0.353	1.09E-02	0.522	5.56E-03	0.744	1.97E-03	1.713	6.26E-04	1.953	6.26E-04	2.129	4.41E-04
0.179	9.57E-04	0.26	4.75E-03	0.358	1.13E-02	0.535	5.29E-03	0.771	1.80E-03	1.714	7.29E-04	1.956	5.30E-04	2.131	5.30E-04
0.188	1.08E-03	0.263	5.02E-03	0.367	1.17E-02	0.538	5.02E-03	0.815	1.65E-03	1.718	6.26E-04	1.968	6.26E-04	2.138	4.41E-04
0.199	1.21E-03	0.267	5.29E-03	0.385	1.13E-02	0.551	4.75E-03	0.849	1.49E-03	1.9	4.41E-04	1.969	5.30E-04	2.51	3.58E-04
0.204	1.35E-03	0.269	5.56E-03	0.39	1.09E-02	0.563	4.50E-03	0.901	1.35E-03	1.901	6.26E-04	1.971	4.41E-04	2.6	0
0.208	1.49E-03	0.274	5.85E-03	0.399	1.05E-02	0.569	4.25E-03	0.903	1.49E-03	1.903	5.30E-04	1.972	5.30E-04		
0.211	1.65E-03	0.278	6.14E-03	0.404	1.02E-02	0.586	4.01E-03	0.904	1.35E-03	1.906	6.26E-04	1.979	6.26E-04		
0.214	1.80E-03	0.282	6.43E-03	0.414	9.79E-03	0.6	3.77E-03	0.967	1.21E-03	1.91	4.41E-04	1.981	5.30E-04		
0.217	1.97E-03	0.285	6.74E-03	0.426	9.42E-03	0.601	4.01E-03	1.051	1.08E-03	1.911	6.26E-04	1.989	6.26E-04		



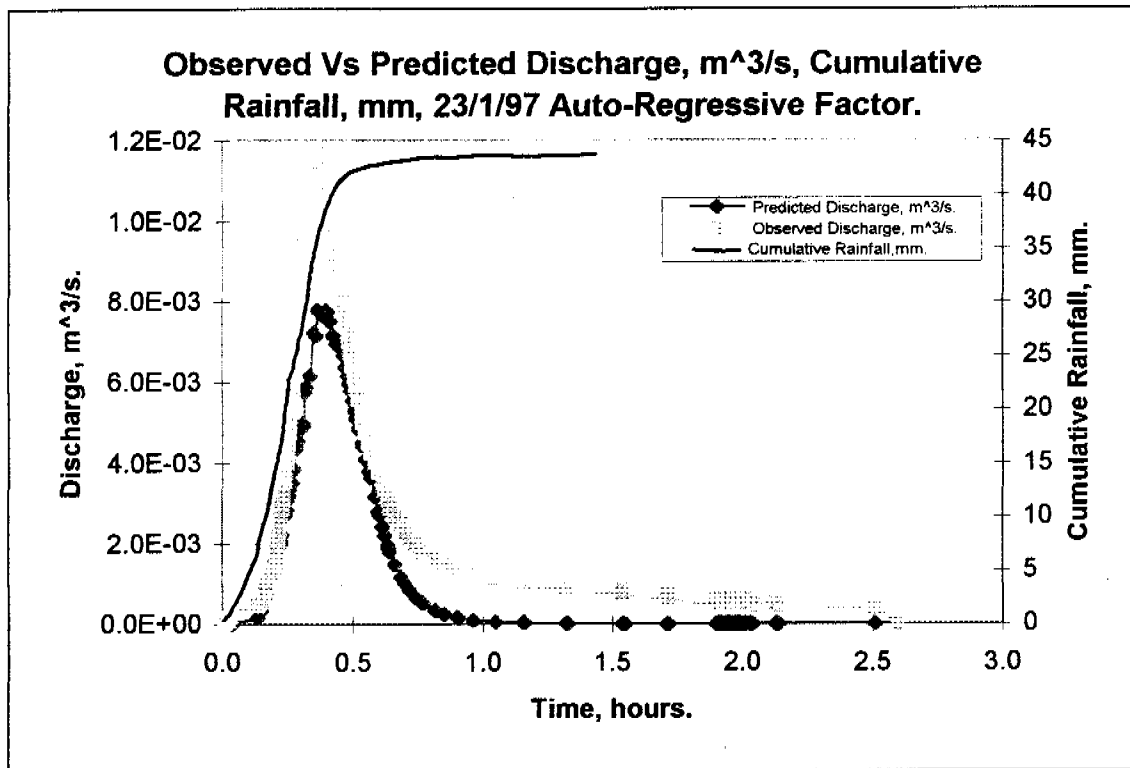
NLFIT Input files: 23197.fw, 23197.ro/rf

NLFIT Output files: 23197.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	2.257	0.1087	$S\phi$	0.001	
e_m	1.5957	0.0506	ϕ	51.591	1.119

Convergence Monitor.	R^2 , %.	Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.0986	97.7	0.7857	0.155	-9.894	0.1581	0.0716	9	5

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 97.7%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 9 times, and the partial auto-correlation plot is exceeded 5 times.



NLFIT Input files: 23197.fw, 23197.ro/rf

NLFIT Output files: 23197a.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	1.554	0.137	$S\phi$	0.001	
e_m	1.226	0.070	ϕ	74.0854	5.717

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1347	95.1	0.2022	0.155	-0.076	0.0681	0.0716	5	4

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 95.1%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 5 times, and the partial auto-correlation plot is exceeded 4 times.

General Comment: The inclusion of an auto-regressive factor, although improving the statistical compliance, the overall quality of the predicted versus observed discharge deteriorated compared to the least squares fitting regime.

23-24th January

RUM 96-97 Monitoring

pit 1 site

Rainfall 23-24/1/97 1919hrs

177

0	0	1.025	4.4	1.192	8.8	1.846	13.4	2.067	18	2.319	22.6	2.625	27.8	2.846	32.4	3.246	37.2
0.811	0.4	1.033	4.6	1.204	9	1.86	13.6	2.068	18.2	2.333	22.8	2.631	28	2.857	32.6	3.247	37.4
0.836	0.6	1.042	4.8	1.206	9.2	1.874	13.8	2.079	18.4	2.375	23.2	2.636	28.2	2.867	32.8	3.257	37.6
0.853	0.8	1.05	5	1.221	9.4	1.885	14	2.092	18.6	2.431	23.4	2.638	28.4	2.882	33	3.268	37.8
0.867	1	1.057	5.2	1.24	9.6	1.886	14.2	2.103	18.8	2.453	23.6	2.646	28.6	2.896	33.4	3.279	38
0.882	1.2	1.058	5.4	1.256	9.8	1.897	14.4	2.114	19.2	2.467	23.8	2.658	28.8	2.91	33.6	3.292	38.4
0.883	1.4	1.067	5.6	1.265	10.2	1.91	14.6	2.126	19.4	2.481	24.2	2.671	29	2.928	33.8	3.306	38.6
0.896	1.6	1.075	5.8	1.274	10.4	1.928	14.8	2.143	19.6	2.497	24.4	2.692	29.4	2.954	34	3.326	38.8
0.91	1.8	1.081	6	1.283	10.6	1.946	15.2	2.163	19.8	2.517	24.6	2.706	29.6	2.982	34.4	3.349	39
0.924	2	1.088	6.4	1.3	10.8	1.958	15.4	2.183	20	2.535	24.8	2.719	29.8	3.011	34.6	3.374	39.4
0.938	2.2	1.096	6.6	1.349	11	1.972	15.6	2.185	20.2	2.55	25.2	2.736	30	3.039	34.8	3.407	39.6
0.939	2.4	1.101	6.8	1.35	11.2	1.989	15.8	2.2	20.4	2.561	25.4	2.751	30.4	3.053	35	3.451	39.8
0.956	2.6	1.108	7	1.394	11.4	1.999	16.2	2.226	20.6	2.568	25.6	2.765	30.6	3.064	35.4	3.608	40
0.968	2.8	1.11	7.2	1.414	11.6	2.008	16.4	2.254	20.8	2.574	26	2.779	30.8	3.078	35.6	3.7	40.2
0.979	3	1.118	7.4	1.447	11.8	2.018	16.6	2.265	21.2	2.582	26.2	2.789	31	3.099	35.8	3.701	40.4
0.988	3.4	1.126	7.6	1.593	12.2	2.028	16.8	2.275	21.4	2.589	26.4	2.797	31.2	3.138	36	6.203	40.6
0.997	3.6	1.135	7.8	1.681	12.4	2.036	17.2	2.283	21.6	2.597	26.8	2.799	31.4	3.168	36.4	6.3	40.6
1.007	3.8	1.146	8.2	1.722	12.6	2.044	17.4	2.293	21.8	2.606	27	2.808	31.6	3.188	36.6		
1.017	4	1.16	8.4	1.783	12.8	2.053	17.6	2.301	22.2	2.611	27.2	2.819	31.8	3.208	36.8		
1.024	4.2	1.178	8.6	1.829	13.2	2.06	17.8	2.308	22.4	2.618	27.6	2.832	32	3.229	37		

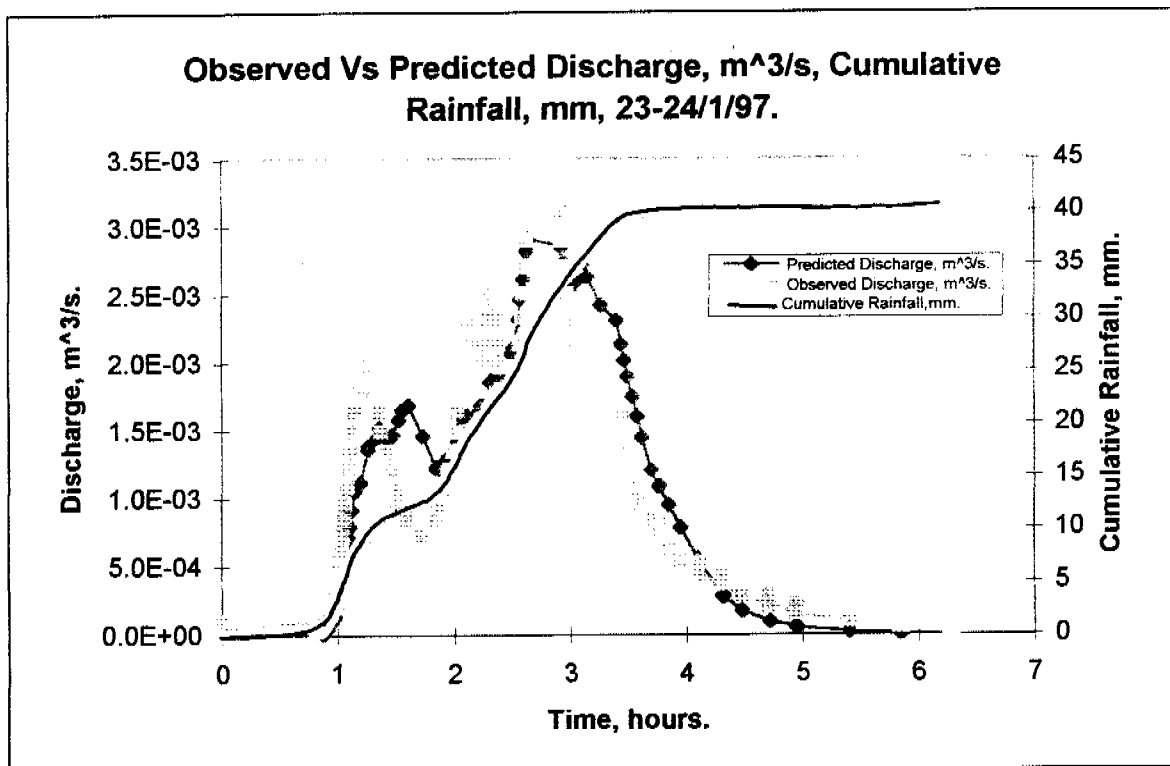
RUM 96-97 Monitoring

pit 1 site

Runoff 23-24/1/97 1919hrs

132

0	0.00E+00	1.193	1.80E-03	2.042	1.80E-03	2.575	2.14E-03	3.401	1.80E-03	4.314	3.58E-04	5.843	9.84E-05
0.001	5.07E-05	1.263	1.97E-03	2.054	1.97E-03	2.588	2.32E-03	3.443	1.65E-03	4.317	4.41E-04	5.846	5.07E-05
0.01	9.84E-05	1.264	1.80E-03	2.072	2.14E-03	2.596	2.51E-03	3.465	1.49E-03	4.318	3.58E-04	5.847	9.84E-05
0.011	5.07E-05	1.265	1.97E-03	2.106	2.32E-03	2.621	2.70E-03	3.492	1.35E-03	4.478	2.83E-04	5.849	5.07E-05
0.882	9.84E-05	1.34	1.80E-03	2.231	2.14E-03	2.631	2.90E-03	3.532	1.21E-03	4.713	2.14E-04	5.85	9.84E-05
0.914	1.53E-04	1.358	1.65E-03	2.251	1.97E-03	2.643	3.11E-03	3.575	1.08E-03	4.714	2.83E-04	5.854	5.07E-05
0.951	2.14E-04	1.374	1.49E-03	2.253	2.14E-03	2.924	2.90E-03	3.618	9.57E-04	4.715	2.14E-04	5.857	9.84E-05
0.974	2.83E-04	1.438	1.35E-03	2.258	1.97E-03	2.926	3.11E-03	3.696	8.39E-04	4.717	2.83E-04	5.858	5.07E-05
0.988	3.58E-04	1.483	1.21E-03	2.261	2.14E-03	2.928	2.90E-03	3.763	7.29E-04	4.718	2.14E-04	5.864	9.84E-05
1.004	4.41E-04	1.525	1.08E-03	2.29	2.32E-03	2.951	2.70E-03	3.764	8.39E-04	4.721	2.83E-04	5.865	5.07E-05
1.021	5.30E-04	1.556	9.57E-04	2.311	2.51E-03	2.968	2.51E-03	3.768	7.29E-04	4.722	2.14E-04	6.267	9.97E-06
1.036	6.26E-04	1.611	8.39E-04	2.361	2.32E-03	2.993	2.32E-03	3.847	6.26E-04	4.944	1.53E-04	6.3	0
1.05	7.29E-04	1.735	7.29E-04	2.378	2.14E-03	3.01	2.14E-03	3.954	5.30E-04	4.946	2.14E-04		
1.058	8.39E-04	1.847	8.39E-04	2.394	1.97E-03	3.033	1.97E-03	4.1	4.41E-04	4.949	1.53E-04		
1.072	9.57E-04	1.878	9.57E-04	2.432	1.80E-03	3.035	2.14E-03	4.101	5.30E-04	4.95	2.14E-04		
1.085	1.08E-03	1.911	1.08E-03	2.503	1.97E-03	3.036	1.97E-03	4.104	4.41E-04	4.951	1.53E-04		
1.093	1.21E-03	1.953	1.21E-03	2.504	1.80E-03	3.056	2.14E-03	4.106	5.30E-04	4.954	2.14E-04		
1.108	1.35E-03	1.999	1.35E-03	2.511	1.97E-03	3.107	1.97E-03	4.107	4.41E-04	4.956	1.53E-04		
1.126	1.49E-03	2.018	1.49E-03	2.513	1.80E-03	3.149	1.80E-03	4.31	3.58E-04	5.41	9.84E-05		
1.151	1.65E-03	2.032	1.65E-03	2.56	1.97E-03	3.268	1.97E-03	4.311	4.41E-04	5.842	5.07E-05		



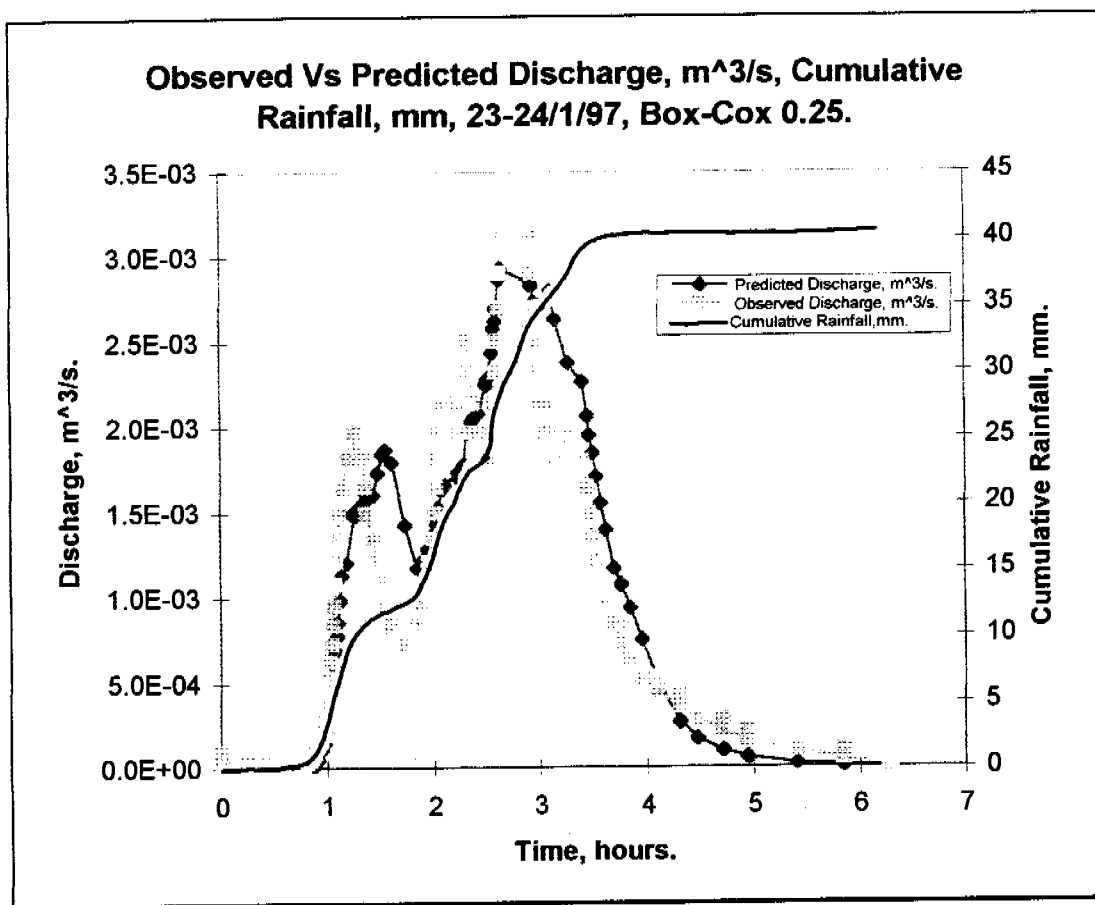
NLFIT Input files: 2324197.fw, 2324197.ro/rf

NLFIT Output files: 2324197.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.625	0.081	$S\phi$	1.9503	0.2352
e_m	1.2664	0.087	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.02048	86.8	0.8054	0.1687	-10.203	0.1258	0.0778	8	5

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 86.8%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 8 times, and the partial auto-correlation plot is exceeded 5 times.

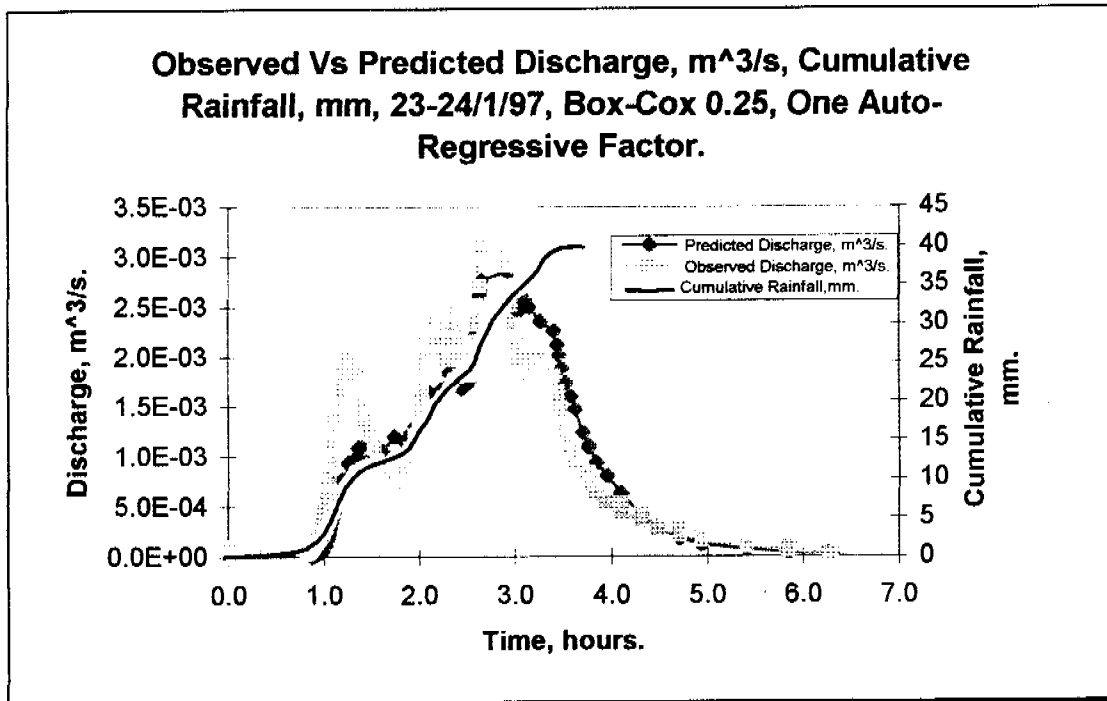


NLFIT Input files: 2324197.fw, 2324197.ro/rf
 NLFIT Output files: 23241g25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.7170	0.095	$S\phi$	1.746	0.233
e_m	1.316	0.0807	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.07687	87.2	0.8021	0.1687	-9.465	0.129	0.0778	8	3

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 87.2%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 8 times, and the partial auto-correlation plot is exceeded 3 times.



NLFIT Input files: 2324197.fw, 2324197.ro/rf

NLFIT Output files: 23241a25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.7052	0.127	$S\phi$	2.541	1.160
e_m	1.463	0.183	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.21812	82.6	0.1466	0.1687	0.026	0.1579	0.0778	2	2

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is not adequate 82.6%, the cumulative periodogram does pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 2 times, and the partial auto-correlation plot is exceeded 2 times.

General Comment: The inclusion of an auto-regressive factor to a more general error model, 23241a25.*, has yielded a better fit than a least squares model fit, 2324197.*, and the inclusion of only a more general error model, 23241g25.*.

28th January

RUM 96-97 Monitoring

pit 1 site

Rainfall 28/1/97 1246hrs

121

0	0	0.281	4.8	0.386	9.2	0.507	14	0.59	18.2	0.725	23.4	3.144	28.2
0.006	0.2	0.286	5.2	0.399	9.4	0.511	14.2	0.594	18.6	0.731	23.6	4	28.2
0.014	0.4	0.292	5.4	0.417	9.8	0.513	14.4	0.597	18.8	0.738	23.8		
0.022	0.8	0.297	5.6	0.418	10	0.517	14.6	0.601	19.2	0.744	24.2		
0.029	1	0.3	5.8	0.432	10.2	0.521	14.8	0.604	19.4	0.751	24.4		
0.038	1.2	0.301	6	0.444	10.4	0.522	15	0.608	19.8	0.758	24.6		
0.044	1.6	0.311	6.2	0.451	10.8	0.528	15.2	0.613	20	0.764	25		
0.056	1.8	0.318	6.4	0.456	11	0.532	15.4	0.617	20.2	0.771	25.2		
0.063	2	0.325	6.6	0.46	11.2	0.536	15.6	0.621	20.6	0.781	25.4		
0.072	2.4	0.326	6.8	0.464	11.4	0.538	15.8	0.626	20.8	0.789	25.6		
0.083	2.6	0.331	7	0.465	11.6	0.543	16	0.633	21	0.806	26		
0.094	2.8	0.333	7.2	0.468	11.8	0.553	16.2	0.644	21.2	0.832	26.2		
0.108	3	0.335	7.4	0.472	12	0.563	16.4	0.646	21.4	1.024	26.4		
0.125	3.4	0.338	7.6	0.474	12.2	0.564	16.6	0.656	21.6	1.299	26.6		
0.142	3.6	0.34	7.8	0.478	12.4	0.568	16.8	0.667	21.8	1.46	27		
0.163	3.8	0.342	8	0.482	12.6	0.574	17	0.674	22	1.607	27.2		
0.192	4	0.344	8.2	0.488	13	0.578	17.4	0.685	22.4	1.803	27.4		
0.225	4.2	0.353	8.4	0.493	13.2	0.582	17.6	0.697	22.6	2.654	27.6		
0.226	4.4	0.363	8.8	0.497	13.6	0.586	17.8	0.711	22.8	2.926	27.8		
0.246	4.6	0.376	9	0.501	13.8	0.588	18	0.718	23	2.928	28		

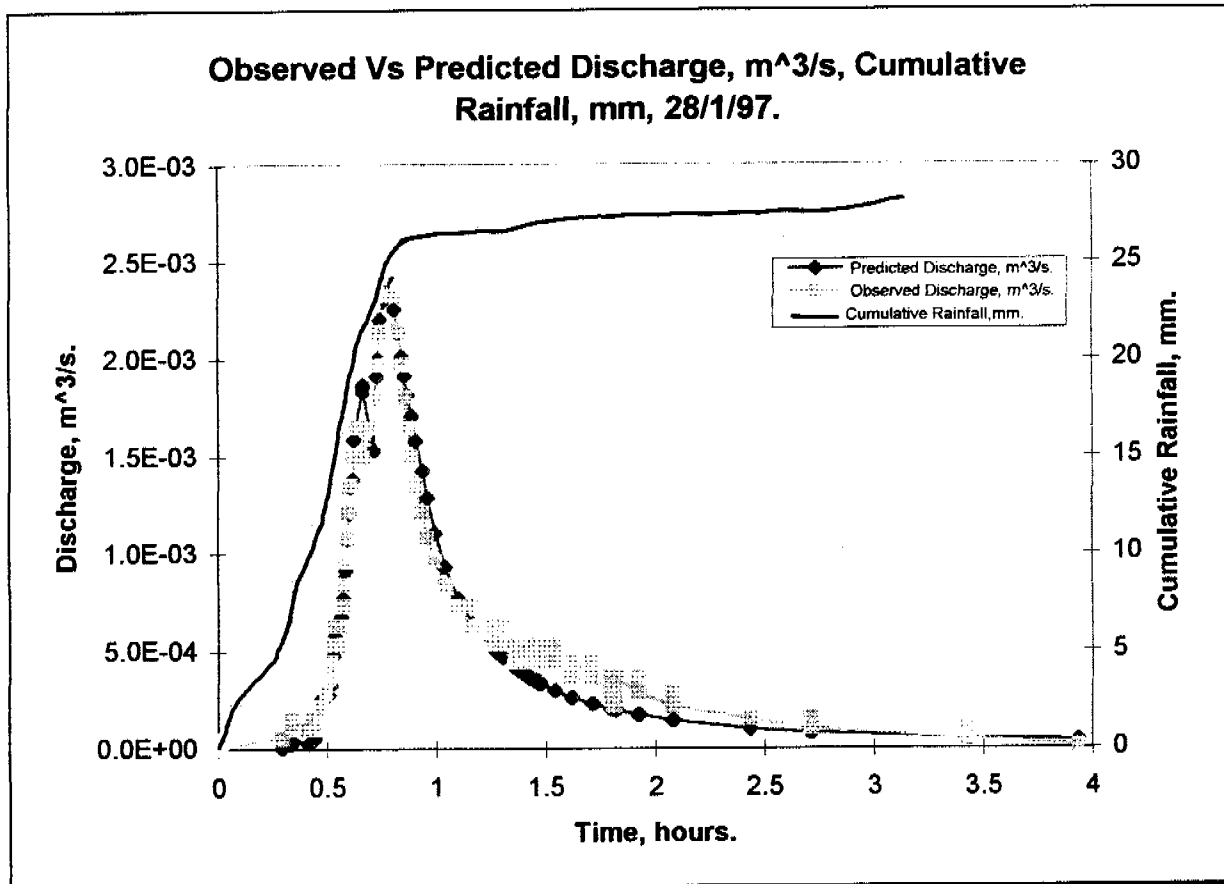
RUM 96-97 Monitoring

pit 1 site

Runoff 28/1/97 1246hrs

133

0	0	0.597	1.08E-03	0.91	1.35E-03	1.301	6.26E-04	1.433	4.41E-04	1.717	4.41E-04	2.085	2.14E-04
0.001	9.97E-06	0.604	1.21E-03	0.938	1.21E-03	1.303	5.30E-04	1.435	5.30E-04	1.719	3.58E-04	2.438	1.53E-04
0.297	5.07E-05	0.61	1.35E-03	0.963	1.08E-03	1.356	4.41E-04	1.436	4.41E-04	1.797	2.83E-04	2.708	9.84E-05
0.335	9.84E-05	0.618	1.49E-03	0.999	9.57E-04	1.357	5.30E-04	1.439	5.30E-04	1.799	3.58E-04	2.71	1.53E-04
0.342	1.53E-04	0.625	1.65E-03	1.044	8.39E-04	1.381	4.41E-04	1.453	4.41E-04	1.804	2.83E-04	2.713	9.84E-05
0.414	9.84E-05	0.667	1.49E-03	1.1	7.29E-04	1.383	5.30E-04	1.456	5.30E-04	1.808	2.14E-04	2.715	1.53E-04
0.438	1.53E-04	0.668	1.65E-03	1.168	6.26E-04	1.39	4.41E-04	1.464	4.41E-04	1.81	3.58E-04	2.717	9.84E-05
0.439	9.84E-05	0.669	1.49E-03	1.169	7.29E-04	1.392	5.30E-04	1.467	5.30E-04	1.811	2.83E-04	3.425	5.07E-05
0.444	1.53E-04	0.715	1.65E-03	1.171	6.26E-04	1.393	4.41E-04	1.471	4.41E-04	1.814	3.58E-04	3.426	9.84E-05
0.476	2.14E-04	0.731	1.80E-03	1.253	5.30E-04	1.396	5.30E-04	1.472	5.30E-04	1.815	2.14E-04	3.431	5.07E-05
0.497	2.83E-04	0.738	1.97E-03	1.257	6.26E-04	1.404	4.41E-04	1.474	4.41E-04	1.817	2.83E-04	3.436	9.84E-05
0.511	3.58E-04	0.744	2.14E-03	1.26	5.30E-04	1.406	5.30E-04	1.475	5.30E-04	1.818	2.14E-04	3.44	5.07E-05
0.519	4.41E-04	0.758	2.32E-03	1.264	6.26E-04	1.41	4.41E-04	1.479	4.41E-04	1.821	3.58E-04	3.939	9.97E-06
0.533	5.30E-04	0.774	2.51E-03	1.265	5.30E-04	1.411	5.30E-04	1.544	5.30E-04	1.822	2.14E-04	4	0
0.54	6.26E-04	0.813	2.32E-03	1.269	6.26E-04	1.414	4.41E-04	1.546	4.41E-04	1.824	3.58E-04		
0.563	5.30E-04	0.831	2.14E-03	1.271	5.30E-04	1.418	5.30E-04	1.622	3.58E-04	1.924	2.83E-04		
0.565	6.26E-04	0.846	1.97E-03	1.274	6.26E-04	1.419	4.41E-04	1.624	4.41E-04	1.925	3.58E-04		
0.576	7.29E-04	0.858	1.80E-03	1.275	5.30E-04	1.425	5.30E-04	1.713	3.58E-04	1.932	2.83E-04		
0.583	8.39E-04	0.871	1.65E-03	1.278	6.26E-04	1.428	4.41E-04	1.714	4.41E-04	2.079	2.14E-04		
0.59	9.57E-04	0.888	1.49E-03	1.279	5.30E-04	1.431	5.30E-04	1.715	3.58E-04	2.081	2.83E-04		



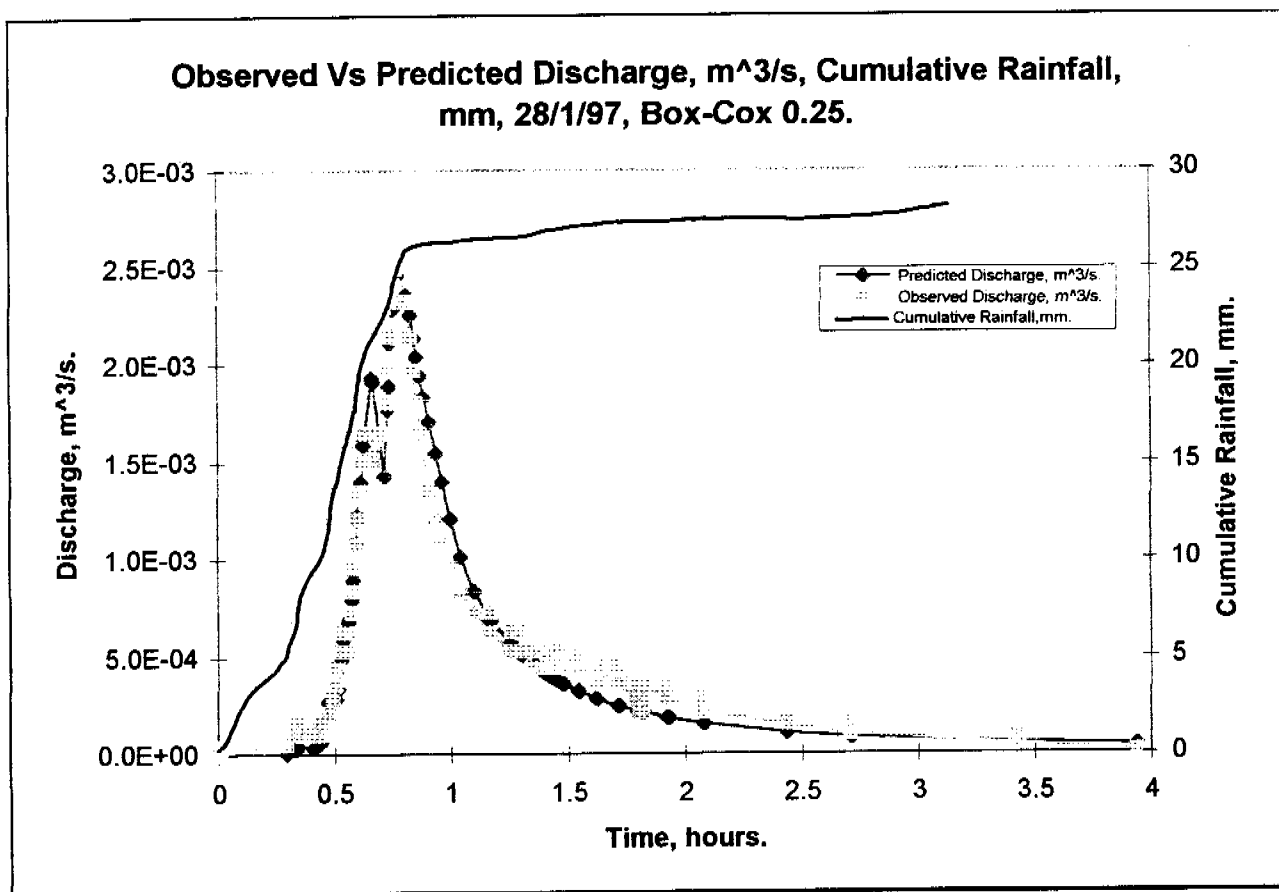
NLFIT Input files: 28197.fw, 28197.ro/rf

NLFIT Output files: 28197.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	9.168	1.083	$S\phi$	0.001	
e_m	2.697	0.083	ϕ	25.520	0.464

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.0846	97.4	0.5158	0.1687	-6.998	0.1214	0.0775	15	7

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 97.4%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 15 times, and the partial auto-correlation plot is exceeded 7 times.

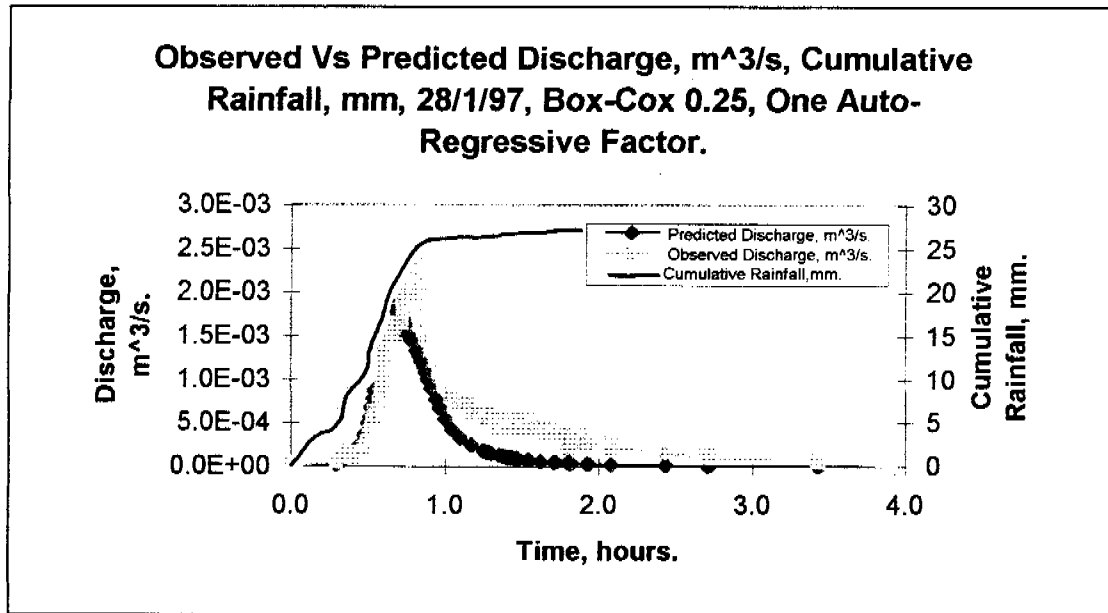


NLFIT Input files: 28197.fw, 28197.ro/rf
 NLFIT Output files: 28197g25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	7.574	0.8921	$S\phi$	0.001	
e_m	2.666	0.0855	ϕ	24.239	0.561

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1178	96.6	0.5244	0.1687	-4.300	0.1035	0.0775	15	4

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 96.6%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 15 times, and the partial auto-correlation plot is exceeded 4 times.



NLFIT Input files: 28197.fw, 28197.ro/rf

NLFIT Output files: 2819725a.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	3.75278	0.9382	$S\phi$	0.001	
e_m	1.627	0.121	ϕ	39.990	3.968

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.00041	78.2	0.435	0.1687	4.733	0.1680	0.0775	7	3

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 78.2%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 7 times, and the partial auto-correlation plot is exceeded 3 times.

General Comment: 28197.* was a good predicted response, 97.4%, with near perfect inclination and recession limbs of the hydrograph. The utilisation of a more general error model deteriorated the fit in the recession portion of the hydrograph, 28197g25.*, the addition of an auto-regressive factor worsened the predicted response even further, 2819725a.*.

19th February

RUM 96-97 Monitoring

pit 1 site

Rainfall 19/2/97 1921hrs

285

0	0	0.24	4.6	0.379	9	0.474	14	0.543	18.6	0.642	23.8	0.722	28.6	0.843	33.2	1.074	37.2	1.269	42.2	1.465	46.4	1.746	51	2.068	55.4	2.51	59.6	3.406	64
0.017	0.2	0.246	4.8	0.383	9.2	0.478	14.4	0.547	18.8	0.646	24	0.724	28.8	0.847	33.4	1.092	37.6	1.276	42.4	1.475	46.6	1.756	51.2	2.093	55.6	2.531	59.8	3.603	64.2
0.028	0.6	0.247	5	0.388	9.4	0.482	14.6	0.551	19	0.649	24.2	0.729	29	0.854	33.6	1.117	37.8	1.278	42.6	1.486	47	1.757	51.4	2.118	56	2.564	60	3.633	64.4
0.036	0.8	0.254	5.2	0.393	9.8	0.486	14.8	0.556	19.4	0.65	24.4	0.736	29.2	0.863	33.8	1.156	38	1.286	42.8	1.496	47.2	1.764	51.6	2.153	56.2	2.6	60.2	3.886	64.6
0.044	1	0.263	5.4	0.399	10	0.49	15	0.56	19.6	0.653	24.6	0.74	29.6	0.871	34	1.167	38.2	1.296	43	1.51	47.4	1.771	51.8	2.196	56.4	2.601	60.4	4.5	64.6
0.053	1.2	0.272	5.6	0.404	10	0.492	15.2	0.564	19.8	0.657	25	0.747	29.8	0.872	34.2	1.175	38.4	1.31	43.2	1.528	47.6	1.779	52	2.219	56.6	2.638	60.6		
0.058	1.4	0.282	5.8	0.41	10	0.496	15.4	0.565	20	0.66	25.2	0.756	30	0.879	34.4	1.182	38.8	1.328	43.6	1.543	47.8	1.789	52.2	2.236	56.8	2.69	60.8		
0.067	1.6	0.296	6.2	0.417	10	0.499	15.6	0.569	20.2	0.664	25.4	0.765	30.2	0.888	34.6	1.189	39	1.35	43.8	1.557	48	1.797	52.4	2.251	57	2.753	61		
0.078	1.8	0.308	6.4	0.422	11	0.5	15.8	0.575	20.4	0.668	25.8	0.772	30.4	0.896	34.8	1.196	39.2	1.365	44	1.571	48.4	1.806	52.6	2.271	57.2	2.775	61.2		
0.096	2.2	0.322	6.6	0.426	11	0.503	16	0.581	20.8	0.672	26	0.774	30.6	0.903	35	1.201	39.4	1.376	44.2	1.586	48.6	1.818	53	2.294	57.4	2.776	61.4		
0.118	2.4	0.333	6.8	0.431	11	0.507	16.2	0.586	21	0.675	26.2	0.781	30.8	0.904	35.2	1.207	39.8	1.386	44.4	1.6	48.8	1.831	53.2	2.317	57.6	2.786	61.6		
0.139	2.6	0.343	7	0.438	11	0.51	16.4	0.592	21.2	0.676	26.4	0.788	31	0.914	35.4	1.213	40	1.396	44.6	1.614	49	1.849	53.4	2.318	57.8	2.797	61.8		
0.156	2.8	0.35	7.2	0.443	12	0.511	16.6	0.599	21.6	0.681	26.6	0.794	31.2	0.932	35.6	1.217	40.2	1.397	44.8	1.625	49.2	1.869	53.6	2.34	58	2.806	62		
0.169	3	0.351	7.4	0.447	12	0.515	16.8	0.604	21.8	0.686	26.8	0.801	31.6	0.954	35.8	1.221	40.6	1.407	45	1.638	49.6	1.896	53.8	2.364	58.2	2.814	62.4		
0.182	3.2	0.357	7.6	0.453	12	0.519	17.2	0.611	22	0.692	27.2	0.807	31.8	0.978	36	1.226	40.8	1.418	45.2	1.65	49.8	1.918	54	2.386	58.4	2.822	62.6		
0.193	3.4	0.363	7.8	0.457	12	0.524	17.4	0.617	22.4	0.696	27.4	0.814	32	1.007	36.2	1.232	41	1.428	45.4	1.663	50	1.939	54.2	2.41	58.6	2.832	62.8		
0.206	3.8	0.367	8	0.461	13	0.528	17.8	0.622	22.6	0.701	27.6	0.821	32.4	1.008	36.4	1.239	41.2	1.438	45.6	1.676	50.2	1.961	54.4	2.433	58.8	2.846	63		
0.217	4	0.368	8.2	0.465	13	0.532	18	0.628	23	0.707	28	0.828	32.6	1.031	36.6	1.246	41.6	1.447	45.8	1.694	50.4	1.988	54.8	2.457	59	2.878	63.4		
0.226	4.2	0.372	8.4	0.469	13	0.538	18.2	0.632	23.2	0.711	28.2	0.836	32.8	1.044	36.8	1.253	41.8	1.449	46	1.715	50.6	2.015	55	2.458	59.2	3.007	63.6		
0.233	4.4	0.375	8.6	0.471	13	0.542	18.4	0.636	23.4	0.717	28.4	0.842	33	1.058	37	1.26	42	1.457	46.2	1.733	50.8	2.042	55.2	2.483	59.4	3.203	63.8		

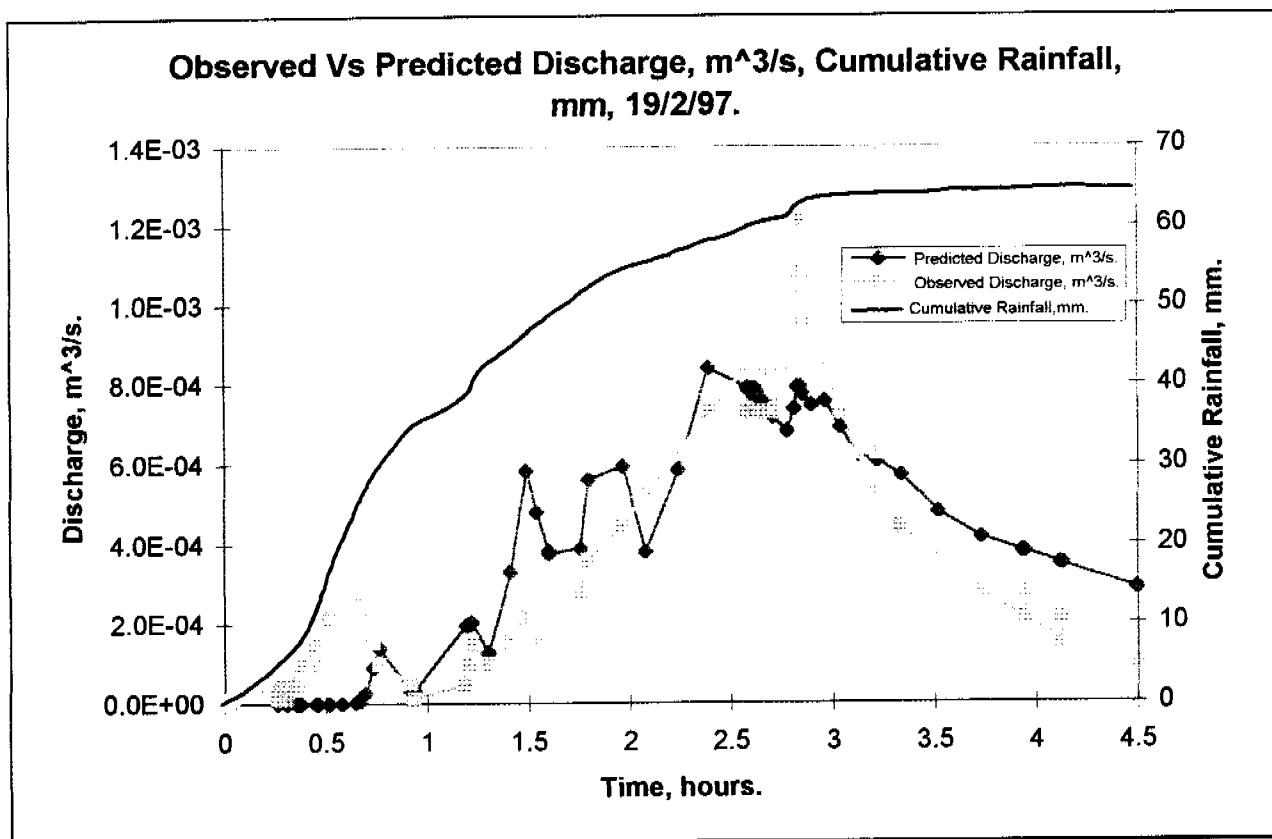
RUM 96-97 Monitoring

pit 1 site

Runoff 19/2/97 1921hrs

91

0	0	0.732	1.53E-04	2.581	8.39E-04	2.703	8.39E-04	3.933	2.83E-04
0.036	9.97E-06	0.765	9.84E-05	2.583	7.29E-04	2.704	7.29E-04	3.935	2.14E-04
0.263	5.07E-05	0.913	5.07E-05	2.585	8.39E-04	2.706	8.39E-04	3.946	2.83E-04
0.264	9.97E-06	0.935	9.97E-06	2.586	7.29E-04	2.707	7.29E-04	3.947	2.14E-04
0.265	5.07E-05	1.188	5.07E-05	2.588	8.39E-04	2.778	8.39E-04	4.121	1.53E-04
0.308	9.97E-06	1.207	9.84E-05	2.59	7.29E-04	2.811	9.57E-04	4.126	2.14E-04
0.31	5.07E-05	1.219	1.53E-04	2.592	8.39E-04	2.828	1.08E-03	4.131	1.53E-04
0.311	9.97E-06	1.3	9.84E-05	2.6	7.29E-04	2.842	1.21E-03	4.132	2.14E-04
0.36	5.07E-05	1.411	1.53E-04	2.601	8.39E-04	2.856	1.08E-03	4.133	1.53E-04
0.381	9.84E-05	1.488	2.14E-04	2.606	7.29E-04	2.9	9.57E-04	4.494	9.84E-05
0.454	1.53E-04	1.542	1.53E-04	2.608	8.39E-04	2.963	8.39E-04	4.5	0
0.458	9.84E-05	1.597	2.14E-04	2.618	7.29E-04	3.035	7.29E-04		
0.46	1.53E-04	1.599	1.53E-04	2.621	8.39E-04	3.122	6.26E-04		
0.461	9.84E-05	1.6	2.14E-04	2.625	7.29E-04	3.214	5.30E-04		
0.463	1.53E-04	1.757	2.83E-04	2.628	8.39E-04	3.215	6.26E-04		
0.517	2.14E-04	1.794	3.58E-04	2.65	7.29E-04	3.218	5.30E-04		
0.583	1.53E-04	1.967	4.41E-04	2.651	8.39E-04	3.339	4.41E-04		
0.653	2.14E-04	2.079	5.30E-04	2.689	7.29E-04	3.519	3.58E-04		
0.669	2.83E-04	2.238	6.26E-04	2.69	8.39E-04	3.731	2.83E-04		
0.694	2.14E-04	2.389	7.29E-04	2.701	7.29E-04	3.931	2.14E-04		



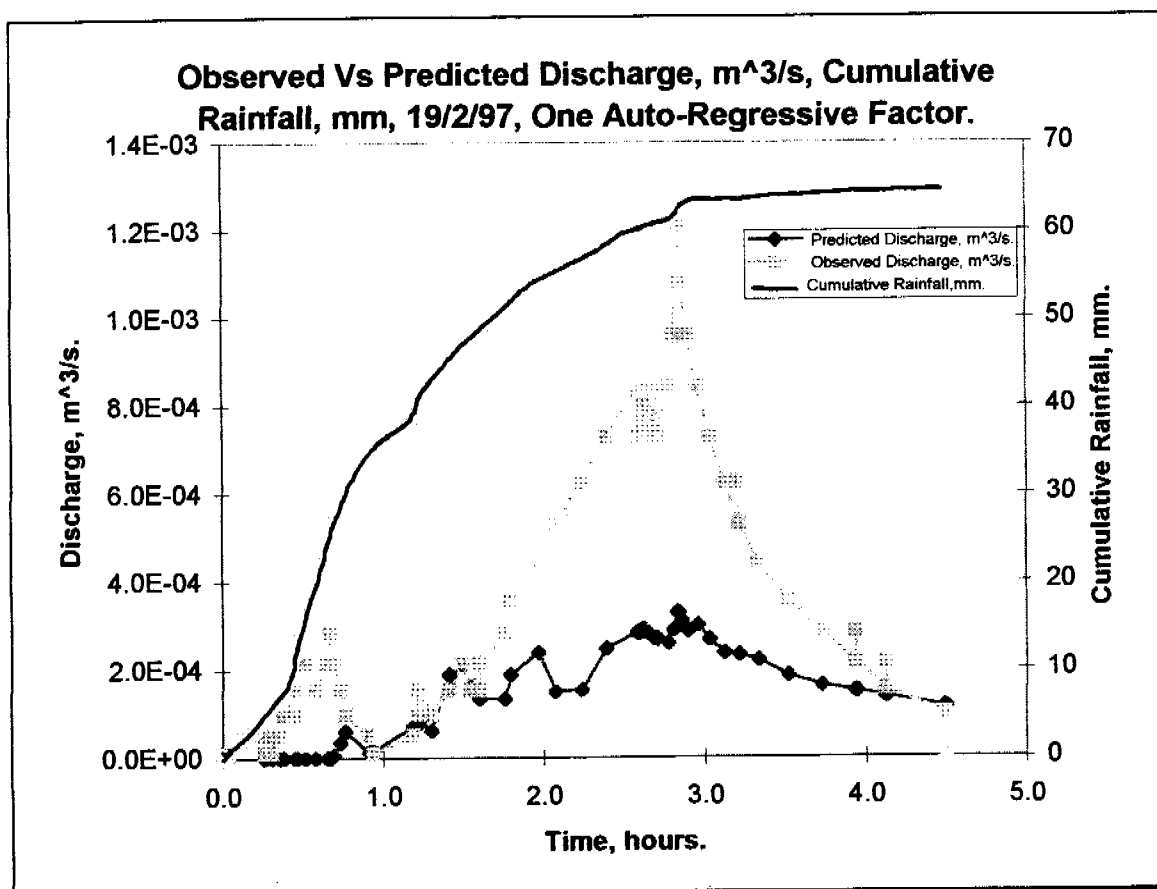
NLFIT Input files: 19297.fw, 19297.ro/rf

NLFIT Output files: 19297.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.6307	0.097	$S\phi$	11.700	0.385
e_m	4.5174	0.3497	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R ² , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.01597	81.2	0.6697	0.2050	-4.198	0.0566	0.0936	10	4

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R² is not adequate 81.2%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 10 times, and the partial auto-correlation plot is exceeded 4 times.



NLFIT Input files: 19297.fw, 192197.ro/rf

NLFIT Output files: 19297a.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	10.2689	13.8353	$S\phi$	20.0872	2.2290
e_m	4.0003	0.5531	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.3485	80.5	0.398	0.205	2.544	0.1569	0.0936	10	3

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is not adequate 80.5%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 10 times, and the partial auto-correlation plot is exceeded 3 times.

General Comment: The inclusion of an auto-regressive factor has dramatically degraded the predicted versus observed response, 19297a.*. The least squares model provides the best alternative for a poorly fitted event.

20th February

RUM 96-97 Monitoring

pit 1 site

Rainfall 20/2/97 1514hrs

138

0	0	0.119	4.8	0.19	9.8	0.278	14.6	0.343	20	0.436	24.4	0.582	29
0.01	0.2	0.121	5	0.193	10	0.279	14.8	0.344	20.2	0.438	24.6	0.59	29.2
0.017	0.4	0.125	5.2	0.197	10.2	0.283	15	0.349	20.4	0.444	24.8	0.604	29.4
0.022	0.6	0.129	5.4	0.201	10.6	0.288	15.4	0.353	20.6	0.453	25	0.669	29.6
0.029	1	0.133	5.8	0.206	10.8	0.292	15.6	0.358	21	0.463	25.2	0.671	29.8
0.04	1.2	0.138	6	0.21	11.2	0.294	16	0.364	21.2	0.471	25.4	0.713	30
0.054	1.4	0.142	6.4	0.214	11.4	0.299	16.2	0.368	21.4	0.472	25.6	0.728	30.2
0.06	1.6	0.146	6.6	0.222	11.6	0.301	16.4	0.369	21.6	0.479	25.8	0.739	30.4
0.065	2	0.15	6.8	0.231	11.8	0.303	16.6	0.375	21.8	0.485	26	0.751	30.6
0.071	2.2	0.154	7.2	0.232	12	0.306	16.8	0.381	22	0.49	26.4	0.764	30.8
0.072	2.4	0.158	7.4	0.238	12.2	0.308	17.2	0.386	22.2	0.494	26.6	0.765	31
0.076	2.8	0.163	7.8	0.24	12.4	0.313	17.4	0.388	22.4	0.5	27	0.778	31.2
0.082	3	0.167	8	0.242	12.6	0.315	17.8	0.393	22.6	0.506	27.2	0.794	31.4
0.093	3.2	0.169	8.2	0.246	12.8	0.318	18	0.399	23	0.51	27.4	0.817	31.6
0.097	3.6	0.172	8.4	0.249	13	0.322	18.4	0.403	23.2	0.515	27.8	0.84	31.8
0.1	3.8	0.174	8.6	0.254	13.4	0.325	18.6	0.408	23.4	0.521	28	0.921	32.2
0.107	4	0.176	8.8	0.26	13.6	0.329	19	0.414	23.6	0.531	28.2	0.968	32.4
0.111	4.2	0.181	9.2	0.265	13.8	0.332	19.2	0.415	23.8	0.54	28.4	2.2	32.4
0.113	4.4	0.185	9.4	0.269	14.2	0.336	19.6	0.421	24	0.572	28.6		
0.117	4.6	0.189	9.6	0.274	14.4	0.34	19.8	0.429	24.2	0.574	28.8		

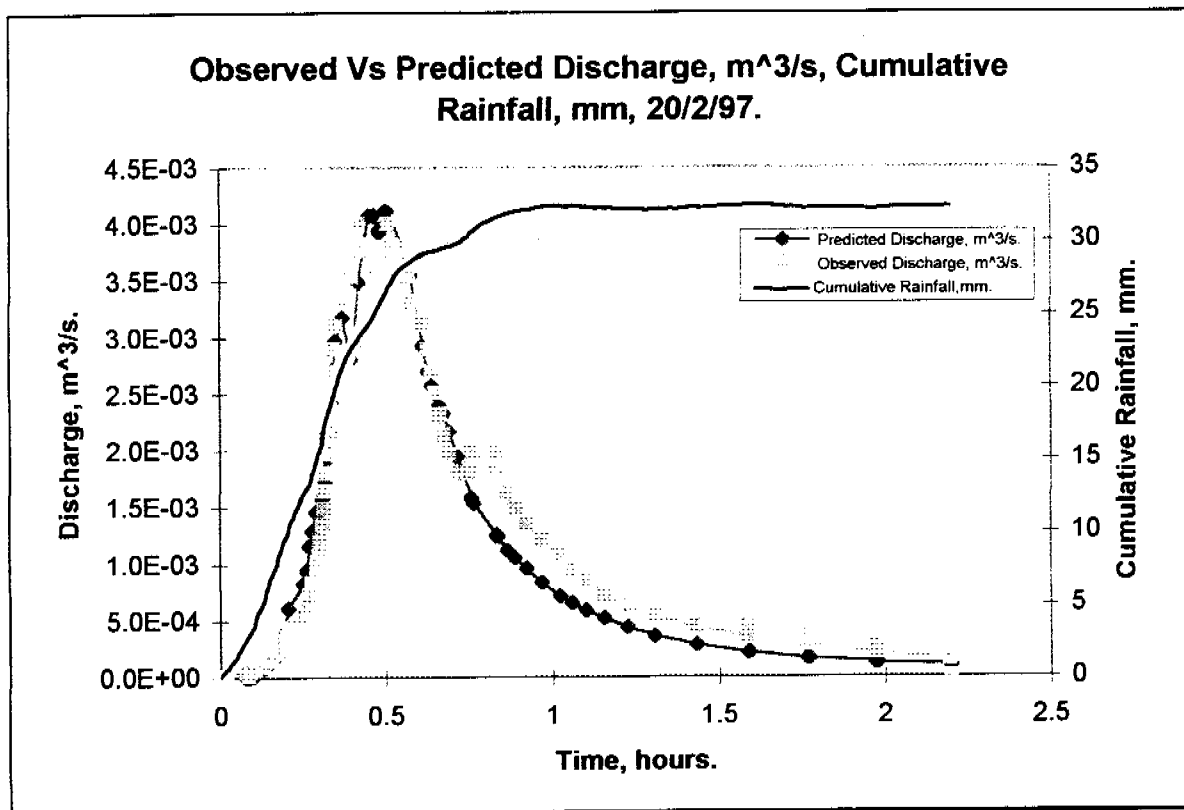
RUM 96-97 Monitoring

pit 1 site

Runoff 20/2/97 1514hrs

83

0	0.00E+00	0.318	1.65E-03	0.575	3.32E-03	1.058	9.57E-04	1.981	2.14E-04		
0.014	9.97E-06	0.322	1.80E-03	0.611	3.11E-03	1.1	8.39E-04	2.196	1.53E-04		
0.078	5.07E-05	0.326	1.97E-03	0.628	2.90E-03	1.154	7.29E-04	2.2	0		
0.085	9.97E-06	0.331	2.14E-03	0.64	2.70E-03	1.224	6.26E-04				
0.099	5.07E-05	0.336	2.51E-03	0.649	2.51E-03	1.308	5.30E-04				
0.133	9.84E-05	0.338	2.70E-03	0.661	2.32E-03	1.433	4.41E-04				
0.157	1.53E-04	0.343	2.90E-03	0.671	2.14E-03	1.588	3.58E-04				
0.175	2.14E-04	0.35	3.11E-03	0.689	1.97E-03	1.589	4.41E-04				
0.185	2.83E-04	0.372	3.32E-03	0.714	1.80E-03	1.593	3.58E-04				
0.192	3.58E-04	0.397	3.54E-03	0.757	1.97E-03	1.765	2.83E-04				
0.208	4.41E-04	0.406	3.77E-03	0.758	1.80E-03	1.767	3.58E-04				
0.251	5.30E-04	0.419	4.01E-03	0.764	1.97E-03	1.768	2.83E-04				
0.263	6.26E-04	0.45	3.77E-03	0.833	1.80E-03	1.771	3.58E-04				
0.272	7.29E-04	0.464	3.54E-03	0.835	1.97E-03	1.774	2.83E-04				
0.279	8.39E-04	0.481	3.32E-03	0.836	1.80E-03	1.972	2.14E-04				
0.293	9.57E-04	0.483	3.54E-03	0.865	1.65E-03	1.974	2.83E-04				
0.3	1.08E-03	0.5	3.77E-03	0.888	1.49E-03	1.975	2.14E-04				
0.304	1.21E-03	0.507	4.01E-03	0.922	1.35E-03	1.976	2.83E-04				
0.311	1.35E-03	0.56	3.77E-03	0.968	1.21E-03	1.978	2.14E-04				
0.315	1.49E-03	0.568	3.54E-03	1.022	1.08E-03	1.979	2.83E-04				



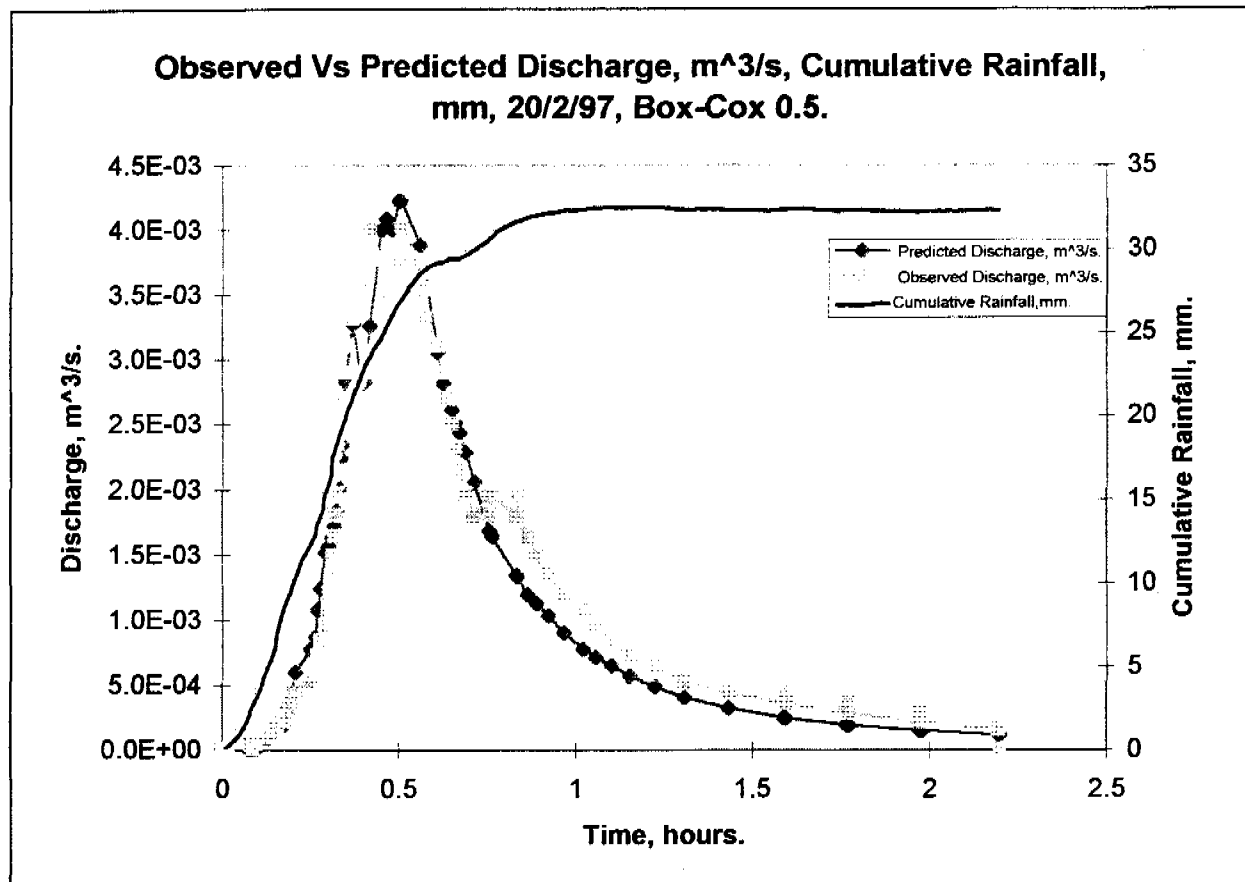
NLFIT Input files: 20297.fw, 202197.ro/rf

NLFIT Output files: 20297.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	3.2113	0.5047	$S\phi$	2.2578	1.9129
e_m	2.0933	0.1891	ϕ	22.7432	4.0251

Convergence Monitor.	R^2 , %.	Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
		Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1216	94.9	0.6263	0.215	-6.403	0.0992	0.0979	4	4

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 94.9%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 4 times, and the partial auto-correlation plot is exceeded 4 times.

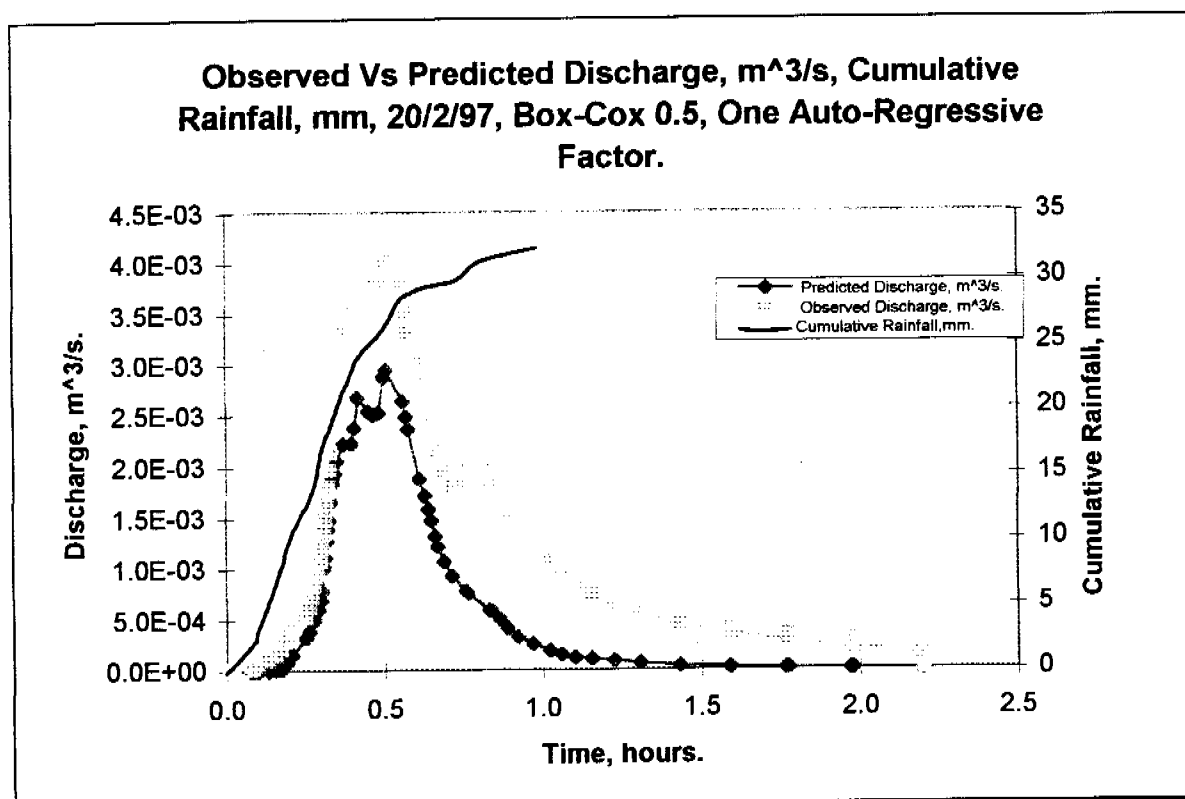


NLFIT Input files: 20297.fw, 20297.ro/rf
 NLFIT Output files: 20297g5.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	3.2100	0.4872	$S\phi$	1.5585	1.7330
e_m	7.18971	0.1854	ϕ	22.9835	3.6822

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1484	94.5	0.6464	0.215	-7.33	0.1064	0.0979	7	3

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 94.5%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 7 times, and the partial auto-correlation plot is exceeded 3 times.



NLFIT Input files: 20297.fw, 20297.ro/rf

NLFIT Output files: 202975a.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	2.1864	0.3240	$S\phi$	13.6427	2.3932
e_m	1.32504	0.0818	ϕ	8.6438	6.6151

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.5307	93.8	0.1279	0.215	-0.889	0.0652	0.0979	1	1

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 93.8%, the cumulative periodogram does pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of |2|, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 1 times, and the partial auto-correlation plot is exceeded 1 times.

General Comment: The least squares predicted response, 20297.*, is superior to all other error models. The inclusion of a Box-Cox of 0.5, 20297g5.*, did not have a dramatic impact upon the predicted response, however there was a slight deterioration in the recession limb of the hydrograph. The inclusion of an auto-regressive factor, 202975a.*, further deteriorated the quality of the predicted response.

22nd February

RUM 96-97 Monitoring

pit 1 site

Rainfall 22/2/97 0514hrs

133

0	0	0.561	4	0.749	8.6	0.846	13	0.978	17.4	1.056	21.8	1.431	26.2
0.081	0.2	0.569	4.4	0.754	8.8	0.854	13.4	0.982	17.8	1.057	22	1.506	26.4
0.231	0.4	0.578	4.6	0.758	9	0.864	13.6	0.986	18	1.063	22.2	1.575	26.6
0.274	0.6	0.586	4.8	0.76	9.2	0.875	13.8	0.989	18.2	1.069	22.4	1.639	26.8
0.304	0.8	0.594	5	0.764	9.4	0.886	14	0.993	18.4	1.078	22.6	1.697	27
0.339	1	0.604	5.2	0.768	9.6	0.9	14.2	0.994	18.6	1.086	22.8	1.754	27.2
0.368	1.2	0.614	5.6	0.772	9.8	0.913	14.4	0.997	18.8	1.099	23.2	1.822	27.6
0.39	1.4	0.625	5.8	0.778	10.2	0.924	14.6	1.001	19	1.113	23.4	1.915	27.8
0.404	1.6	0.635	6	0.783	10.4	0.931	14.8	1.004	19.2	1.126	23.6	2.063	28
0.419	1.8	0.643	6.2	0.789	10.6	0.932	15	1.006	19.4	1.14	23.8	2.26	28.2
0.433	2	0.653	6.4	0.793	10.8	0.936	15.2	1.008	19.6	1.154	24	2.383	28.4
0.463	2.2	0.664	6.6	0.799	11.2	0.94	15.4	1.013	19.8	1.167	24.2	2.628	28.6
0.464	2.4	0.665	6.8	0.804	11.4	0.944	15.6	1.014	20	1.182	24.6	3.085	29
0.492	2.6	0.678	7	0.81	11.6	0.949	15.8	1.018	20.2	1.199	24.8	3.5	29
0.508	2.8	0.697	7.2	0.815	11.8	0.95	16	1.022	20.4	1.224	25		
0.526	3	0.711	7.4	0.819	12	0.954	16.2	1.028	20.6	1.268	25.2		
0.538	3.2	0.722	7.6	0.821	12.2	0.96	16.4	1.033	21	1.303	25.4		
0.539	3.4	0.731	7.8	0.825	12.4	0.965	16.6	1.039	21.2	1.35	25.6		
0.546	3.6	0.738	8.2	0.832	12.6	0.971	17	1.044	21.4	1.39	25.8		
0.554	3.8	0.743	8.4	0.839	12.8	0.975	17.2	1.05	21.6	1.392	26		

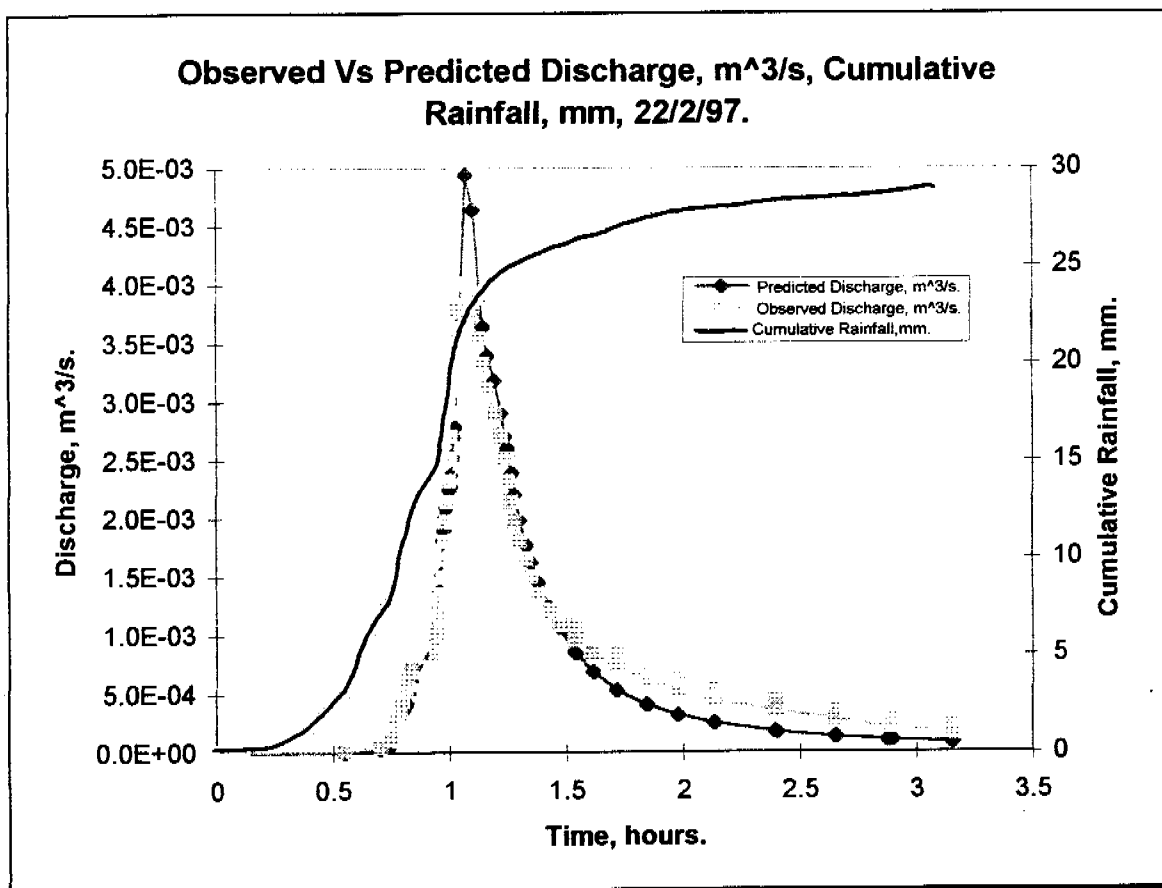
RUM 96-97 Monitoring

pit 1 site

Runoff 22/2/97 0514hrs

87

0	0	0.986	1.97E-03	1.249	2.32E-03	1.979	6.26E-04	2.897	2.83E-04
0.553	9.97E-06	0.992	2.14E-03	1.263	2.14E-03	1.981	5.30E-04	2.899	2.14E-04
0.707	5.07E-05	0.997	2.32E-03	1.279	1.97E-03	2.133	4.41E-04	3.154	1.53E-04
0.747	9.84E-05	1.001	2.51E-03	1.301	1.80E-03	2.135	5.30E-04	3.156	2.14E-04
0.763	1.53E-04	1.006	2.70E-03	1.328	1.65E-03	2.136	4.41E-04	3.157	1.53E-04
0.769	2.14E-04	1.01	2.90E-03	1.351	1.49E-03	2.138	5.30E-04	3.158	2.14E-04
0.779	2.83E-04	1.014	3.11E-03	1.379	1.35E-03	2.139	4.41E-04	3.161	1.53E-04
0.79	3.58E-04	1.019	3.32E-03	1.428	1.21E-03	2.396	3.58E-04	3.447	9.84E-05
0.8	4.41E-04	1.022	3.54E-03	1.468	1.08E-03	2.397	4.41E-04	3.5	0
0.813	5.30E-04	1.035	3.77E-03	1.536	9.57E-04	2.403	3.58E-04		
0.822	6.26E-04	1.072	4.01E-03	1.538	1.08E-03	2.656	2.83E-04		
0.833	7.29E-04	1.101	3.77E-03	1.539	9.57E-04	2.657	3.58E-04		
0.94	8.39E-04	1.129	3.54E-03	1.611	8.39E-04	2.661	2.83E-04		
0.944	9.57E-04	1.143	3.32E-03	1.713	7.29E-04	2.879	2.14E-04		
0.949	1.08E-03	1.163	3.11E-03	1.715	8.39E-04	2.881	2.83E-04		
0.956	1.21E-03	1.196	2.90E-03	1.717	7.29E-04	2.885	2.14E-04		
0.964	1.35E-03	1.219	2.70E-03	1.843	6.26E-04	2.888	2.83E-04		
0.972	1.49E-03	1.235	2.51E-03	1.844	7.29E-04	2.89	2.14E-04		
0.976	1.65E-03	1.244	2.32E-03	1.846	6.26E-04	2.894	2.83E-04		
0.981	1.80E-03	1.246	2.51E-03	1.978	5.30E-04	2.896	2.14E-04		



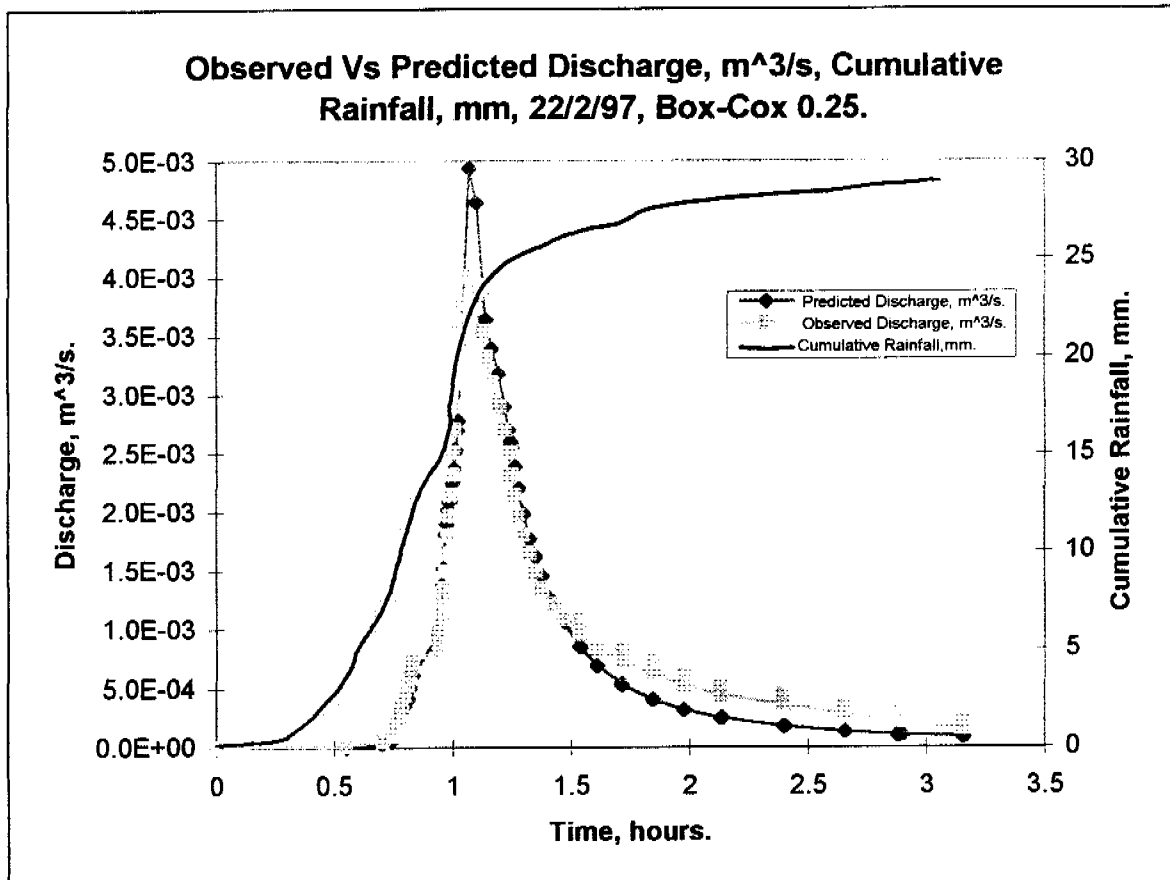
NLFIT Input files: 22297.fw, 22297.ro/rf

NLFIT Output files: 22297.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	4.3148	0.5367	$S\phi$	0.001	
e_m	2.1037	0.0851	ϕ	15.579	0.4887

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.07416	97.6	0.6581	0.2099	-7.398	0.0859	0.0957	16	1

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 97.6%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 16 times, and the partial auto-correlation plot is exceeded 1 times.



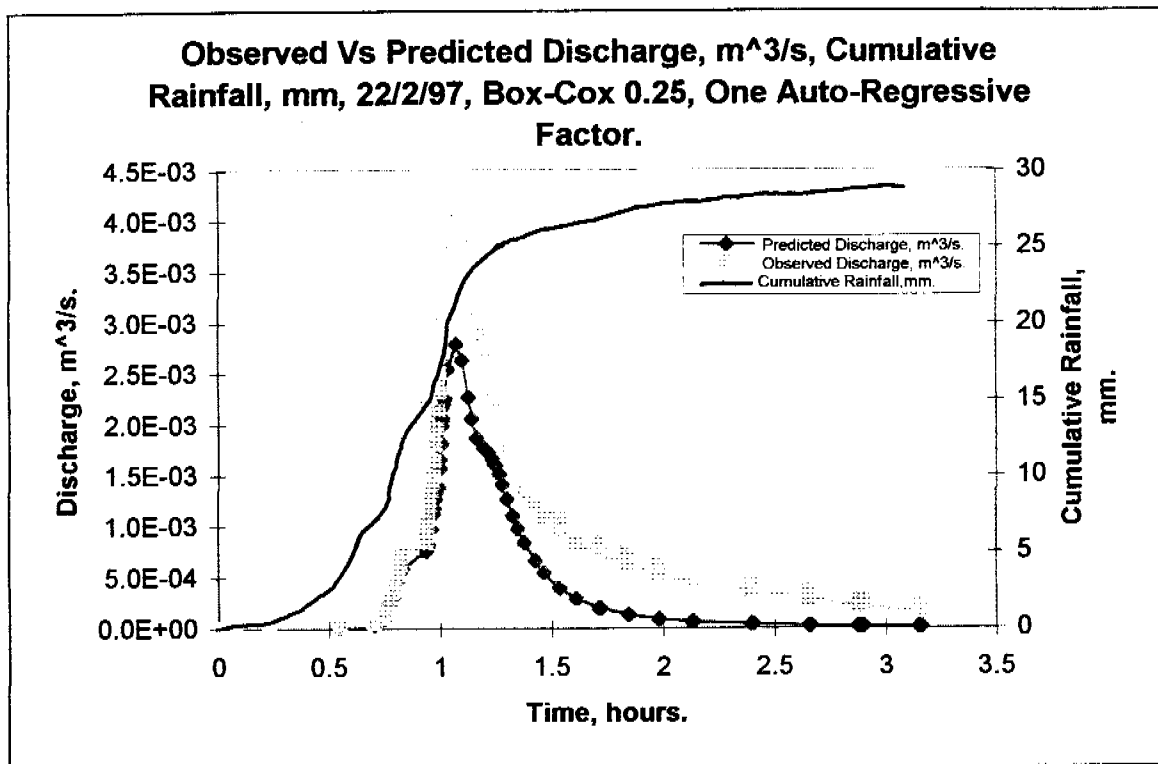
NLFIT Input files: 22297.fw, 22297.ro/rf

NLFIT Output files: 22297g25.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	6.6952	1.0757	$S\phi$	0.001	
e_m	2.6072	0.1186	ϕ	12.6769	0.6236

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.13191	96.0	0.6662	0.2099	-7.906	0.935	0.0957	12	1

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 96.0%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 12 times, and the partial auto-correlation plot is exceeded 1 times.



NLFIT Input files: 22297.fw, 22297.ro/rf

NLFIT Output files: 2229725a.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	0.9314	0.2723	$S\phi$	0.001	
e_m	1.3378	0.1258	ϕ	9.5213	2.5950

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1046	96.8	0.3041	0.2099	0.957	0.0977	0.0957	2	3

Storm Specific Comment: The convergence monitor is adequate, 0.1, the R^2 is adequate 96.8%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 2 times, and the partial auto-correlation plot is exceeded 3 times.

General Comment: The predicted response of 22297.* is adequate compared to the observed hydrograph. The peak, however is over-predicted, and the recession limb is under-predicted slightly. 22297g25.*, the utilisation of a more general error model had little visual impact upon the quality of the predicted response, compared to 22297.*. The addition of an auto-regressive parameter, 2229725a.*, degraded the predicted response considerably.

22nd February pm Event

RUM 96-97 Monitoring

pit 1 site

Rainfall 22/2/97 1141hrs

123

0	0	0.214	4.4	0.335	8.8	0.617	13	0.81	17.2	0.972	22.2	1.549	26.4
0.119	0.2	0.218	4.6	0.342	9	0.643	13.2	0.818	17.4	0.981	22.4	2.282	26.6
0.132	0.4	0.225	4.8	0.347	9.2	0.675	13.4	0.828	17.8	0.99	22.6	3.225	26.8
0.139	0.6	0.231	5.2	0.353	9.4	0.689	13.6	0.836	18	0.999	22.8	4.2	26.8
0.14	0.8	0.235	5.4	0.363	9.6	0.697	13.8	0.844	18.2	1.008	23.2		
0.146	1	0.24	5.6	0.372	9.8	0.699	14	0.851	18.4	1.018	23.4		
0.151	1.2	0.247	5.8	0.374	10	0.708	14.2	0.86	18.8	1.029	23.6		
0.157	1.4	0.253	6	0.383	10.2	0.717	14.4	0.868	19	1.04	23.8		
0.158	1.6	0.26	6.4	0.396	10.4	0.725	14.6	0.875	19.2	1.054	24		
0.164	1.8	0.268	6.6	0.41	10.6	0.733	14.8	0.882	19.4	1.069	24.2		
0.169	2	0.279	6.8	0.424	10.8	0.742	15	0.89	19.6	1.085	24.4		
0.175	2.4	0.288	7	0.435	11.2	0.75	15.2	0.899	20	1.086	24.6		
0.179	2.6	0.292	7.2	0.444	11.4	0.751	15.4	0.907	20.2	1.1	24.8		
0.183	2.8	0.296	7.4	0.46	11.6	0.76	15.6	0.917	20.4	1.122	25		
0.189	3.2	0.297	7.6	0.511	11.8	0.767	15.8	0.926	20.6	1.189	25.2		
0.196	3.4	0.301	7.8	0.536	12	0.775	16	0.936	20.8	1.326	25.4		
0.201	3.6	0.307	8	0.551	12.2	0.781	16.2	0.943	21.2	1.388	25.6		
0.206	3.8	0.317	8.2	0.574	12.4	0.788	16.6	0.95	21.4	1.442	25.8		
0.21	4	0.326	8.4	0.575	12.6	0.793	16.8	0.957	21.6	1.443	26		
0.211	4.2	0.333	8.6	0.601	12.8	0.801	17	0.964	21.8	1.492	26.2		

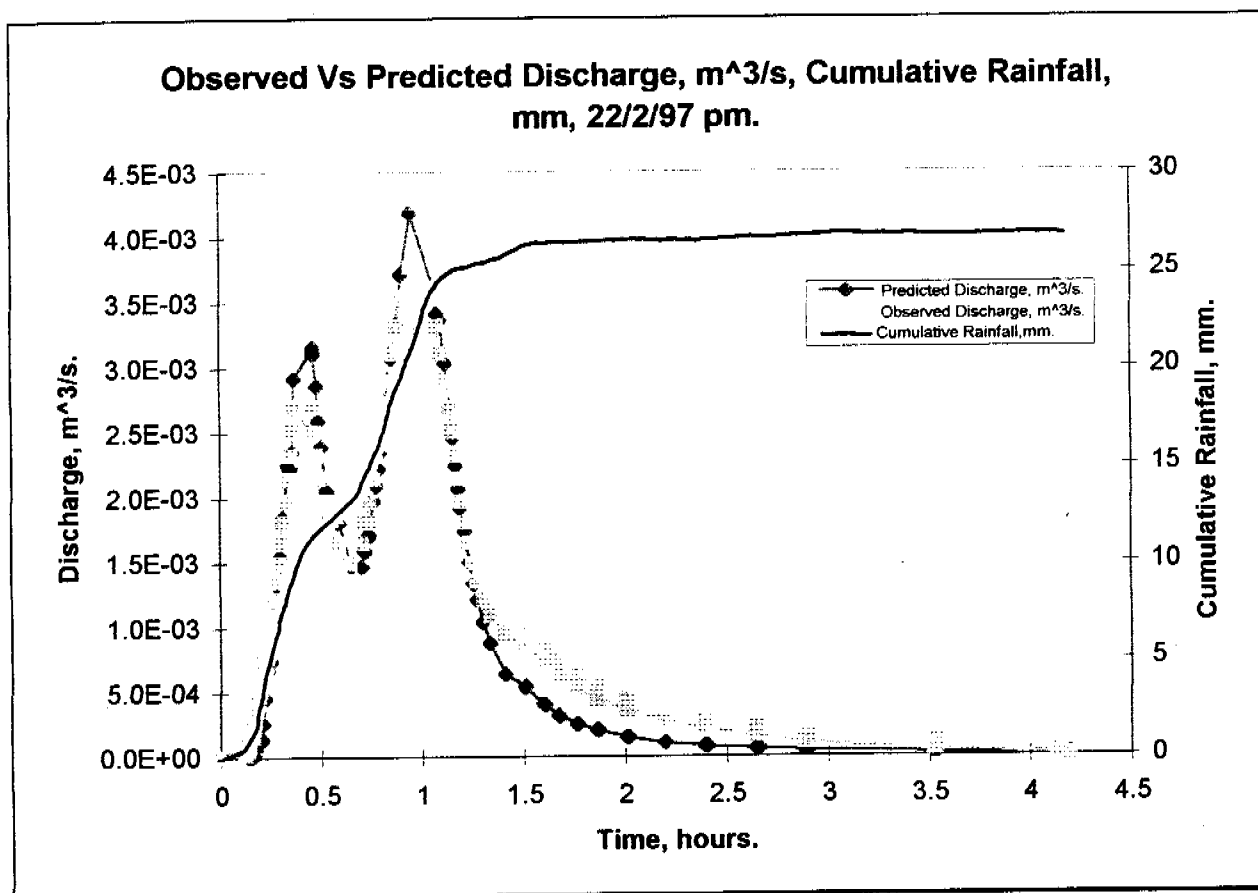
RUM 96-97 Monitoring

pit 1 site

Runoff 22/2/97 1141hrs

119

0	0.00E+00	0.351	2.32E-03	0.774	2.32E-03	1.271	1.35E-03	1.868	4.41E-04	2.657	1.53E-04		
0.144	9.84E-05	0.36	2.51E-03	0.786	2.51E-03	1.3	1.21E-03	1.871	5.30E-04	2.66	2.14E-04		
0.163	1.53E-04	0.371	2.70E-03	0.794	2.70E-03	1.335	1.08E-03	1.872	4.41E-04	2.661	1.53E-04		
0.169	2.14E-04	0.465	2.51E-03	0.835	2.90E-03	1.413	9.57E-04	2.008	3.58E-04	2.664	2.14E-04		
0.176	2.83E-04	0.467	2.70E-03	0.857	3.11E-03	1.508	8.39E-04	2.01	4.41E-04	2.665	1.53E-04		
0.182	3.58E-04	0.468	2.51E-03	0.879	3.32E-03	1.51	9.57E-04	2.013	3.58E-04	2.882	9.84E-05		
0.188	4.41E-04	0.481	2.32E-03	0.901	3.54E-03	1.511	8.39E-04	2.014	4.41E-04	2.883	1.53E-04		
0.196	5.30E-04	0.493	2.14E-03	0.95	3.77E-03	1.601	7.29E-04	2.018	3.58E-04	2.893	9.84E-05		
0.206	6.26E-04	0.504	1.97E-03	1.065	3.54E-03	1.603	8.39E-04	2.196	2.83E-04	2.899	1.53E-04		
0.213	7.29E-04	0.531	1.80E-03	1.078	3.32E-03	1.608	7.29E-04	2.392	2.14E-04	2.901	9.84E-05		
0.221	8.39E-04	0.532	1.97E-03	1.094	3.11E-03	1.674	6.26E-04	2.393	2.83E-04	3.521	5.07E-05		
0.238	9.57E-04	0.533	1.80E-03	1.119	2.90E-03	1.675	7.29E-04	2.4	2.14E-04	3.522	9.84E-05		
0.25	1.08E-03	0.594	1.65E-03	1.14	2.70E-03	1.678	6.26E-04	2.401	2.83E-04	3.525	5.07E-05		
0.263	1.21E-03	0.65	1.49E-03	1.153	2.51E-03	1.763	5.30E-04	2.403	2.14E-04	3.528	9.84E-05		
0.293	1.35E-03	0.707	1.65E-03	1.167	2.32E-03	1.765	6.26E-04	2.406	2.83E-04	3.529	5.07E-05		
0.297	1.49E-03	0.719	1.80E-03	1.181	2.14E-03	1.767	5.30E-04	2.407	2.14E-04	3.535	9.84E-05		
0.303	1.65E-03	0.739	1.97E-03	1.194	1.97E-03	1.861	4.41E-04	2.642	1.53E-04	3.536	5.07E-05		
0.31	1.80E-03	0.74	1.80E-03	1.211	1.80E-03	1.863	5.30E-04	2.643	2.14E-04	4.124	9.97E-06		
0.336	1.97E-03	0.742	1.97E-03	1.235	1.65E-03	1.865	4.41E-04	2.649	1.53E-04	4.2	0		
0.347	2.14E-03	0.763	2.14E-03	1.254	1.49E-03	1.867	5.30E-04	2.65	2.14E-04				



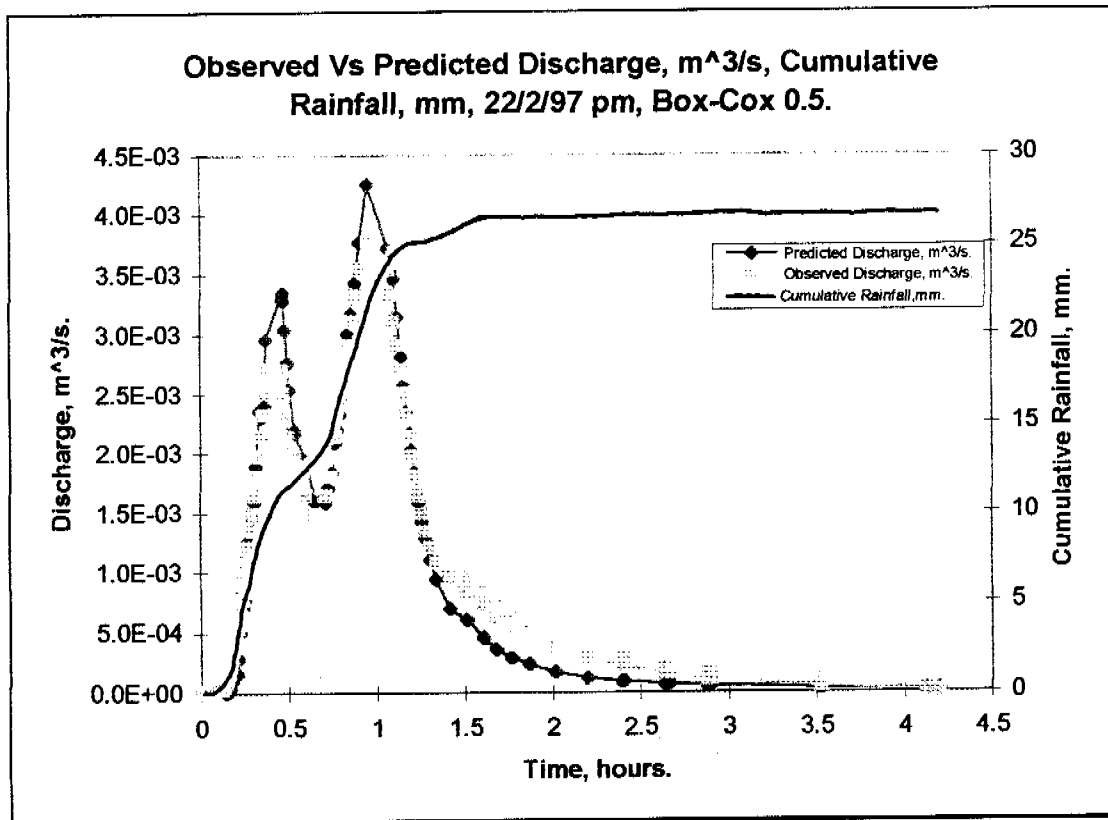
NLFIT Input files: 22297pm.fw, 22297pm.ro/rf

NLFIT Output files: 22297pm.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	11.6162	2.0045	$S\phi$	3.2335	0.1646
e_m	2.2374	0.0957	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1471	97.2	0.7130	0.1786	-8.454	0.1210	0.0819	9	1

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 97.2%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 9 times, and the partial auto-correlation plot is exceeded 1 times.

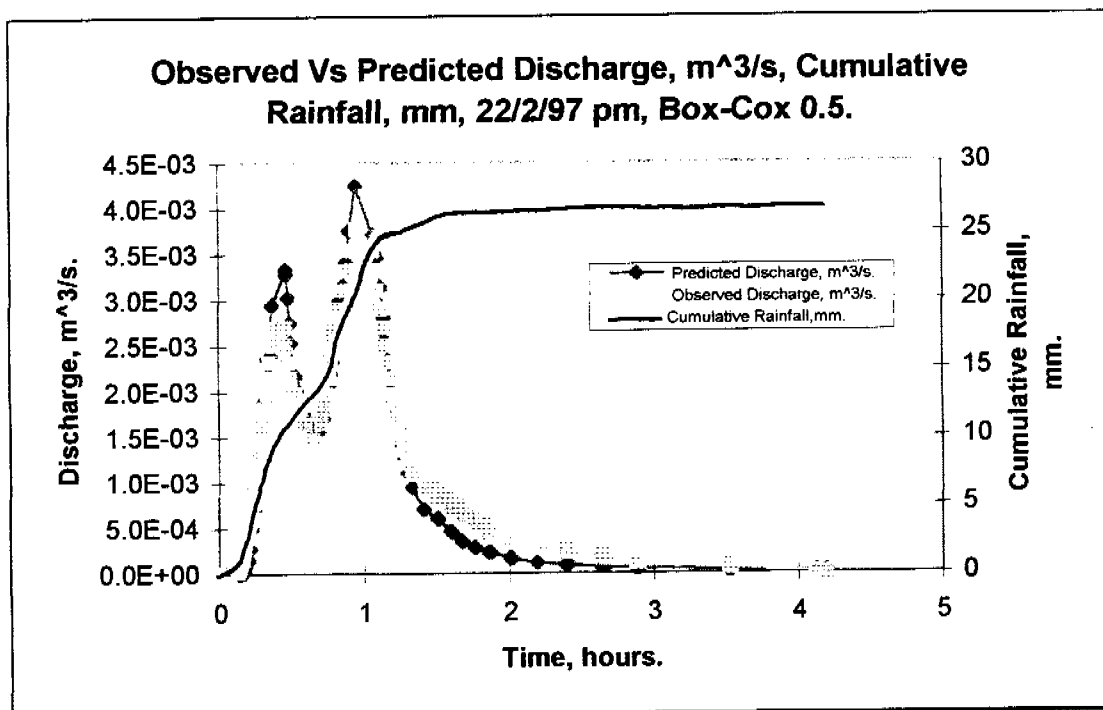


NLFIT Input files: 22297pm.fw, 22297pm.ro/rf
 NLFIT Output files: 22297pm5.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	11.0298	2.2028	$S\phi$	2.7654	0.2017
e_m	2.2681	0.1115	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.3285	97.1	0.7689	0.1786	-8.446	0.0911	0.0819	10	2

Storm Specific Comment: The convergence monitor is not adequate, below 0.1, the R^2 is adequate 97.1%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot exceeds the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 10 times, and the partial auto-correlation plot is exceeded 2 times.



NLFIT Input files: 22297pm.fw, 22297pm.ro/rf
 NLFIT Output files: 222pm5a.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	6.1110	0.6369	$S\phi$	3.1698	0.6111
e_m	1.8741	0.0803	ϕ	0.001	

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.0655	95.9	0.1618	0.1786	1.483	0.0808	0.0819	1	2

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is adequate 95.9%, the cumulative periodogram does pass the test statistic. The standardised residual versus time plot does not exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does pass the test statistic. The auto-correlation plot is exceeded 1 times, and the partial auto-correlation plot is exceeded 2 times.

General Comment: Although there is obvious problems with the least squares model, 22297pm.*, with respect to test statistics, the predicted response is slightly superior to 22297pm5.*, and 222pm5a*. The model including a Box-Cox factor of 0.5, and an auto-regressive factor, statistically is the best fit, however the visual exactness of the predicted response is indeterminately worse or better than that of 22297pm.*.

23rd February

RUM 96-97 Monitoring

pit 1 site

Rainfall 23/2/97 0016hrs

97

0	0	0.475	4.6	0.519	10.4	1.131	14.6	2.635	19.4
0.065	0.2	0.478	4.8	0.525	10.6	1.219	14.8	3.154	19.6
0.089	0.4	0.479	5	0.542	10.8	1.281	15	3.172	19.8
0.117	0.6	0.482	5.2	0.574	11	1.349	15.4	3.183	20.2
0.172	1	0.485	5.6	0.628	11.2	1.431	15.6	3.192	20.4
0.183	1.2	0.488	6	0.676	11.4	1.489	15.8	3.211	20.6
0.189	1.4	0.489	6.2	0.678	11.6	1.547	16	3.236	20.8
0.193	1.6	0.492	6.6	0.719	11.8	1.601	16.2	3.268	21
0.194	1.8	0.493	6.8	0.733	12	1.66	16.6	3.296	21.4
0.199	2	0.494	7	0.747	12.2	1.724	16.8	3.325	21.6
0.204	2.2	0.496	7.2	0.757	12.4	1.776	17	3.363	21.8
0.336	2.4	0.497	7.4	0.767	12.8	1.829	17.2	3.41	22
0.338	2.6	0.499	7.8	0.783	13	1.892	17.4	3.454	22.2
0.44	2.8	0.501	8.4	0.808	13.2	1.946	17.8	3.503	22.6
0.45	3	0.504	8.8	0.835	13.4	2.006	18	3.6	22.8
0.456	3.2	0.506	9	0.853	13.6	2.064	18.2	3.786	23
0.46	3.4	0.507	9.2	0.883	13.8	2.124	18.4	4.1	23
0.465	3.8	0.508	9.4	0.953	14	2.221	18.6		
0.469	4	0.513	9.8	0.954	14.2	2.343	19		
0.472	4.4	0.517	10	1.051	14.4	2.458	19.2		

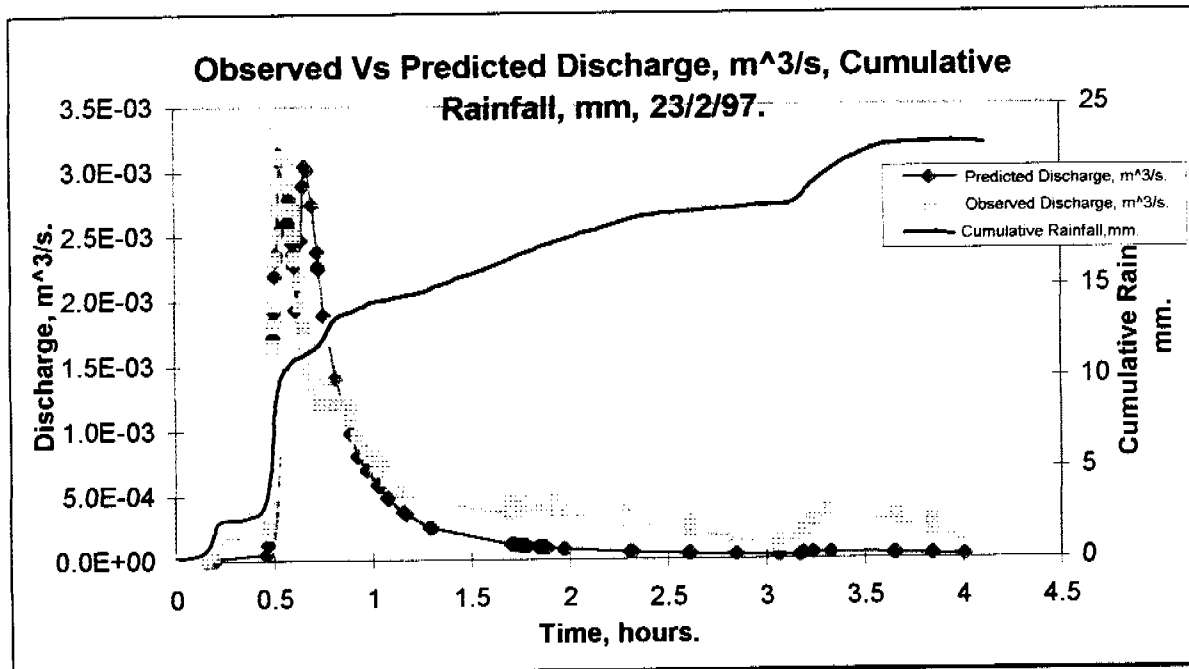
RUM 96-97 Monitoring

pit 1 site

Runoff 23/2/97 0016hrs

154

0	0	0.506	1.97E-03	0.653	1.80E-03	1.078	7.29E-04	1.724	3.58E-04	1.847	3.58E-04	1.976	3.58E-04	3.326	3.58E-04
0.153	9.97E-06	0.507	2.32E-03	0.664	1.65E-03	1.079	6.26E-04	1.725	4.41E-04	1.849	4.41E-04	2.307	2.83E-04	3.649	2.83E-04
0.189	5.07E-05	0.51	2.51E-03	0.676	1.49E-03	1.157	5.30E-04	1.726	3.58E-04	1.851	3.58E-04	2.308	3.58E-04	3.65	3.58E-04
0.196	9.84E-05	0.513	2.70E-03	0.7	1.35E-03	1.16	6.26E-04	1.74	4.41E-04	1.854	4.41E-04	2.311	2.83E-04	3.651	2.83E-04
0.204	1.53E-04	0.515	2.90E-03	0.721	1.21E-03	1.161	5.30E-04	1.743	3.58E-04	1.86	3.58E-04	2.313	3.58E-04	3.653	3.58E-04
0.464	2.14E-04	0.517	3.11E-03	0.728	1.35E-03	1.163	6.26E-04	1.744	4.41E-04	1.863	4.41E-04	2.318	2.83E-04	3.656	2.83E-04
0.471	2.83E-04	0.524	3.32E-03	0.729	1.21E-03	1.164	5.30E-04	1.746	3.58E-04	1.864	3.58E-04	2.322	3.58E-04	3.663	3.58E-04
0.474	3.58E-04	0.536	3.11E-03	0.757	1.35E-03	1.169	6.26E-04	1.747	4.41E-04	1.867	4.41E-04	2.324	2.83E-04	3.664	2.83E-04
0.476	4.41E-04	0.538	3.32E-03	0.818	1.21E-03	1.171	5.30E-04	1.749	3.58E-04	1.868	3.58E-04	2.607	2.14E-04	3.844	2.14E-04
0.479	5.30E-04	0.539	3.11E-03	0.889	1.08E-03	1.292	4.41E-04	1.753	4.41E-04	1.869	4.41E-04	2.608	2.83E-04	3.846	2.83E-04
0.483	6.26E-04	0.575	2.90E-03	0.89	1.21E-03	1.294	5.30E-04	1.754	3.58E-04	1.871	3.58E-04	2.613	2.14E-04	3.85	2.14E-04
0.486	7.29E-04	0.576	3.11E-03	0.892	1.08E-03	1.296	4.41E-04	1.771	4.41E-04	1.872	4.41E-04	2.615	2.83E-04	4.006	1.53E-04
0.489	8.39E-04	0.578	2.90E-03	0.926	9.57E-04	1.297	5.30E-04	1.772	3.58E-04	1.875	3.58E-04	2.617	2.14E-04	4.008	2.14E-04
0.493	9.57E-04	0.586	2.70E-03	0.969	8.39E-04	1.299	4.41E-04	1.779	4.41E-04	1.879	4.41E-04	2.849	1.53E-04	4.011	1.53E-04
0.494	1.08E-03	0.599	2.51E-03	1.024	7.29E-04	1.704	3.58E-04	1.782	3.58E-04	1.881	3.58E-04	3.064	9.84E-05	4.1	0
0.496	1.21E-03	0.601	2.70E-03	1.025	8.39E-04	1.706	4.41E-04	1.783	4.41E-04	1.882	4.41E-04	3.065	1.53E-04		
0.497	1.35E-03	0.603	2.51E-03	1.026	7.29E-04	1.711	3.58E-04	1.785	3.58E-04	1.885	3.58E-04	3.068	9.84E-05		
0.5	1.49E-03	0.614	2.32E-03	1.028	8.39E-04	1.715	4.41E-04	1.786	4.41E-04	1.886	4.41E-04	3.171	1.53E-04		
0.501	1.65E-03	0.631	2.14E-03	1.029	7.29E-04	1.717	3.58E-04	1.843	3.58E-04	1.888	3.58E-04	3.188	2.14E-04		
0.504	1.80E-03	0.64	1.97E-03	1.076	6.26E-04	1.718	4.41E-04	1.844	4.41E-04	1.975	4.41E-04	3.238	2.83E-04		



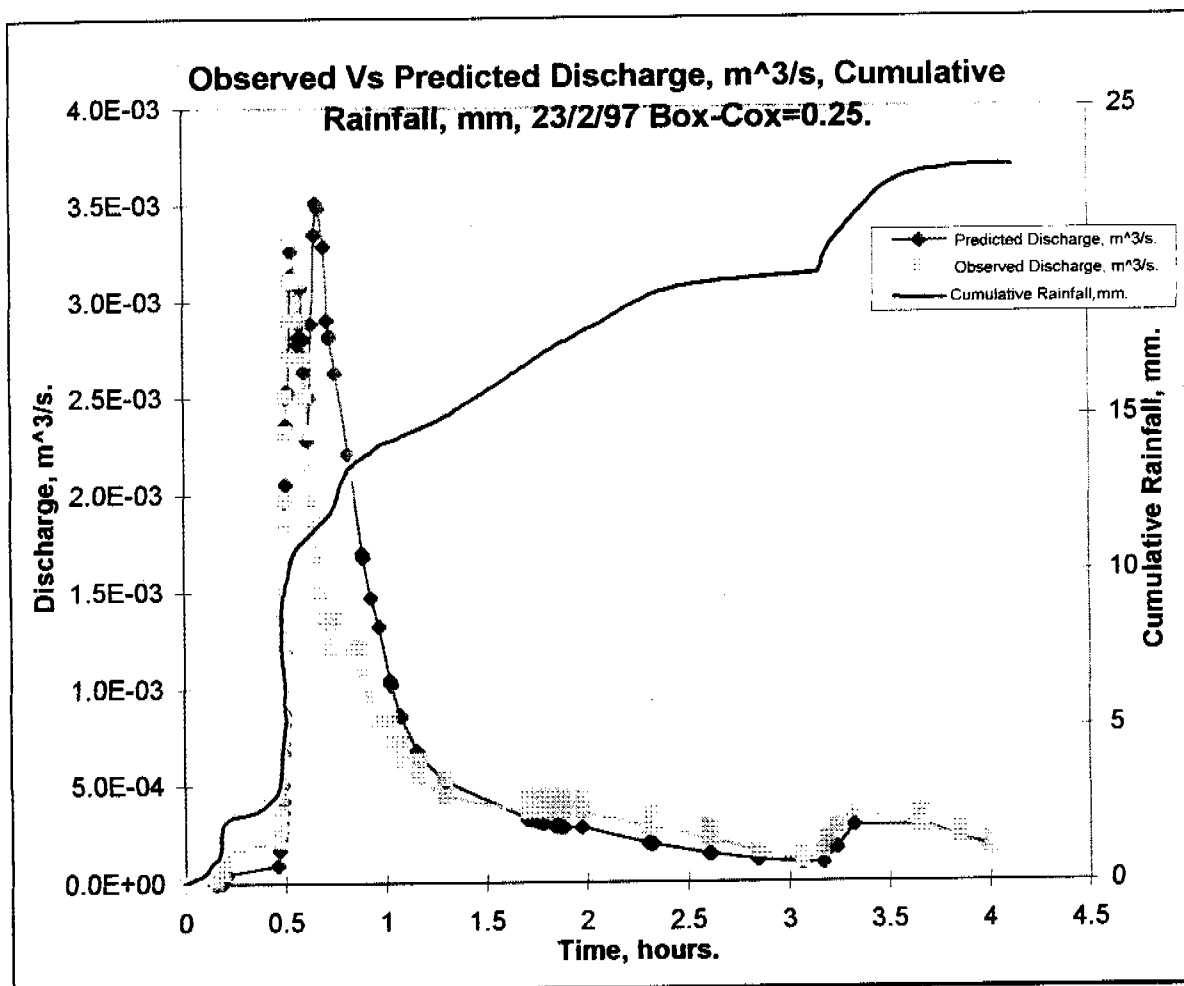
NLFIT Input files: 23297.fw, 23297.ro/rf

NLFIT Output files: 23297.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	6.1101	0.7883	$S\phi$	0.001	
e_m	2.0768	0.10278	ϕ	13.7007	2.768

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.170127	86.4	0.7269	0.156	-9.195	0.2854	0.072	7	5

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 86.4%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 7 times, and the partial auto-correlation plot is exceeded 5 times.

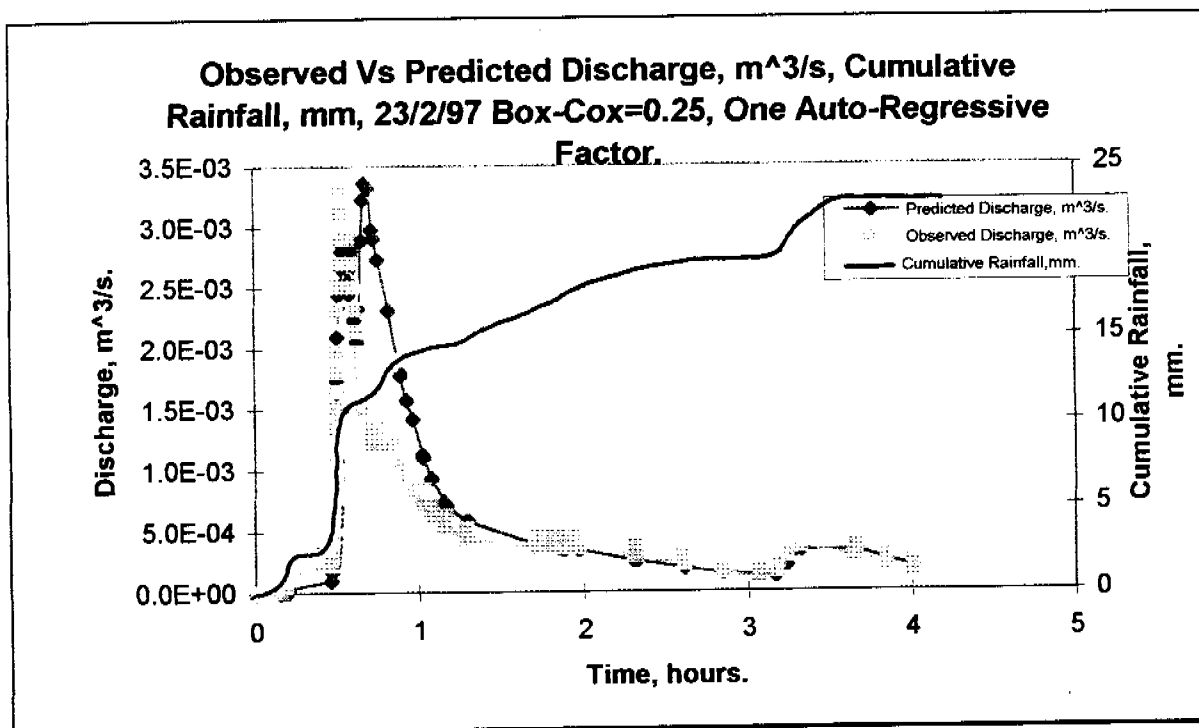


NLFIT Input files: 23297.fw, 23297.ro/rf
 NLFIT Output files: 23297g25.prt/pmf/plt.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	7.094	0.756	$S\phi$	0.001	
e_m	2.425	0.0692	ϕ	2.728	0.266

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.111218	80.6	0.7912	0.156	-7.76	0.23	0.072	16	10

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 80.6%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does exceed the Z statistic limit of $|2|$, the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 16 times, and the partial auto-correlation plot is exceeded 10 times.



NLFIT Input files: 23297.fw, 23297.ro/rf

NLFIT Output files: 2329725a.prt/pmf/plf.

Parameter.	Mean.	Standard Deviation.	Parameter.	Mean.	Standard Deviation.
C_r	7.237	0.6988	$S\phi$	0.001	
e_m	2.5183	0.0887	ϕ	2.20263	0.708

		Cumulative Periodogram.		Standardised Residual Versus Time.	Standardised Residual Versus N(0,1) Variate.		Auto Correlation Plot.	Partial Auto Correlation Plot.
Convergence Monitor.	R^2 , %.	Test Statistic.	5%.	Z.	Test Statistic.	5%.	Exceedances.	Exceedances.
0.1597	75.0	0.2282	0.156	5.77	0.153	0.072	8	5

Storm Specific Comment: The convergence monitor is adequate, below 0.1, the R^2 is not adequate 75.0%, the cumulative periodogram does not pass the test statistic. The standardised residual versus time plot does exceed the Z statistic limit of [2], the standardised residual versus N(0,1) variate does not pass the test statistic. The auto-correlation plot is exceeded 8 times, and the partial auto-correlation plot is exceeded 5 times.

General Comment: The least squares model, even though statistically poor with respect to the diagnostic plots, has the most accurate predicted hydrograph compared to 2329725a (Box-Cox = 0.25, and an Auto-regressive parameter), and 23297g25(Box-Cox = 0.25).

Appendix 4.A

Suspended and Bedload Sediment Data and Sample Processing Procedure.

Suspended and Bedload Sediment Sampling Procedure

Suspended sediment samples were collected at various time intervals throughout a storm event in 600mL Bunzl plastic flasks. Figure 4.A.1, lists the procedure that was followed for suspended sediment sample processing.

- Record initial weight of an aluminium tray, after heating to 105°C for 4 hours to burn off plastic coating on the tray.
- The initial weight, sample number and details of the storm date were etched onto the tray and recorded onto a data sheet to yield tray weight reading.
- Suspended sediment sample was stirred, shaken, and the screw top lid removed to allow the measurement of conductivity with a conductivity probe.
- The sample was then poured into the aluminium tray and weighed again, to yield tray + water + sediment weight reading. The tray was then heated at 105°C for a period of 24 hours to evaporate water.
- The heated tray was then re-weighed to yield tray + sediment weight reading.

Figure 4.A.1: Suspended sediment sample processing procedure.

Bedload sediment samples were collected from within the large PVC pipe, and within the concrete reservoir utilising a hand-held aluminium shovel and placed in large plastic bags. Figure 4.A.2, lists the bedload sediment sample processing procedure.

- Initial weight of an aluminium tray was recorded, after heating to 105°C for 4 hours to burn off the plastic coating.
- The initial weight, sample number and details of the storm date were etched onto the tray and recorded, to yield a tray only weight reading.
- The sediment was dislodged with distilled water from the storage bag, and collected in trays. The tray was then heated at 105°C for a period of at least 24 hours to evaporate any water present in the sample.
- The heated tray was then re-weighed, to yield tray + sediment weight reading.

Figure 4.A.2: Suspended sediment sample processing procedure.

Suspended Sediment Analysis

1st January

Table 4.A.1: Suspended sediment analysis for the storm event occurring on the 1st January.

Site	Pir 1						Base level	2 uS/cm		
Date	1 JAN 97									
TIME		TIME	SAMPLE	CONT WGT	CONT+SED +H2O	water	CONDUCT	OD sed + cont. WT	Sed dried WT	Concentration
				g	g	g	uS/cm	g	g	g/l
hrs	min	sec								
16	0		16:00:00 18	12.97	391.22	378.08	42.9	13.14	0.17	0.449640288
16	1		16:01:00 19	12.81	408.72	395.76	28.1	12.96	0.15	0.379017586
16	2		16:02:00 20	12.93	420.86	407.83	22	13.03	0.1	0.245200206
16	5		16:05:00 21	12.83	422.57	409.6	16.3	12.97	0.14	0.341796875
16	6.5		16:06:30 22	12.9	366.11	353.07	13.9	13.04	0.14	0.396521936
16	8		16:08:00 23	12.78	429.98	417.05	14	12.93	0.15	0.359669104
16	9.5		16:09:30 24	12.86	269.79	256.85	10.2	12.94	0.08	0.311465836
16	11		16:11:00 25	12.84	436.62	423.64	11	12.98	0.14	0.330469266
16	12		16:12:00 26	12.99	411.45	398.39	8.2	13.06	0.07	0.175707222
16	14.5		16:14:30 17	13.03	432.42	419.3	8.1	13.12	0.09	0.214643453
16	15	30	16:15:30 16	13.13	445.87	432.64	8.1	13.23	0.1	0.231139053
16	17		16:17:00 15	12.82	419.15	406.25	7.8	12.9	0.08	0.196923077
16	18		16:18:00 14	12.94	453.81	440.79	7.6	13.02	0.08	0.181492321
16	21	30	16:21:30 13	12.93	456.01	443.01	7.3	13	0.07	0.158009977
16	24		16:24:00 12	12.86	455.37	442.44	7.6	12.93	0.07	0.158213543
16	26		16:26:00 11	12.75	435.74	422.95	7.5	12.79	0.04	0.094573827
16	30		16:30:00 10	12.8	444.7	431.85	9.9	12.85	0.05	0.115780942
16	32		16:32:00 9	12.92	440.5	427.54	8.7	12.96	0.04	0.093558497
16	35		16:35:00 8	12.85	429.65	416.75	9.1	12.9	0.05	0.119976005
16	36		16:36:00 7	12.82	420.06	407.2	14.4	12.86	0.04	0.098231827
16	40		16:40:00 6	12.87	447.37	434.46	8.8	12.91	0.04	0.092068315
17	7		17:07:00 5	12.89	428.4	415.46	18.7	12.94	0.05	0.120348529
17	14		17:14:00 4	12.86	440.91	428.02	19.9	12.89	0.03	0.070090183
17	17		17:17:00 3	12.88	414.7	401.79	20.2	12.91	0.03	0.07466587
17	24		17:24:00 2	12.94	434.7	421.75	26.2	12.95	0.01	0.023710729
17	34		17:34:00 1	12.84	410.43	397.54	23.6	12.89	0.05	0.125773507
Total										2.06
mean										conc. = 0.198411076

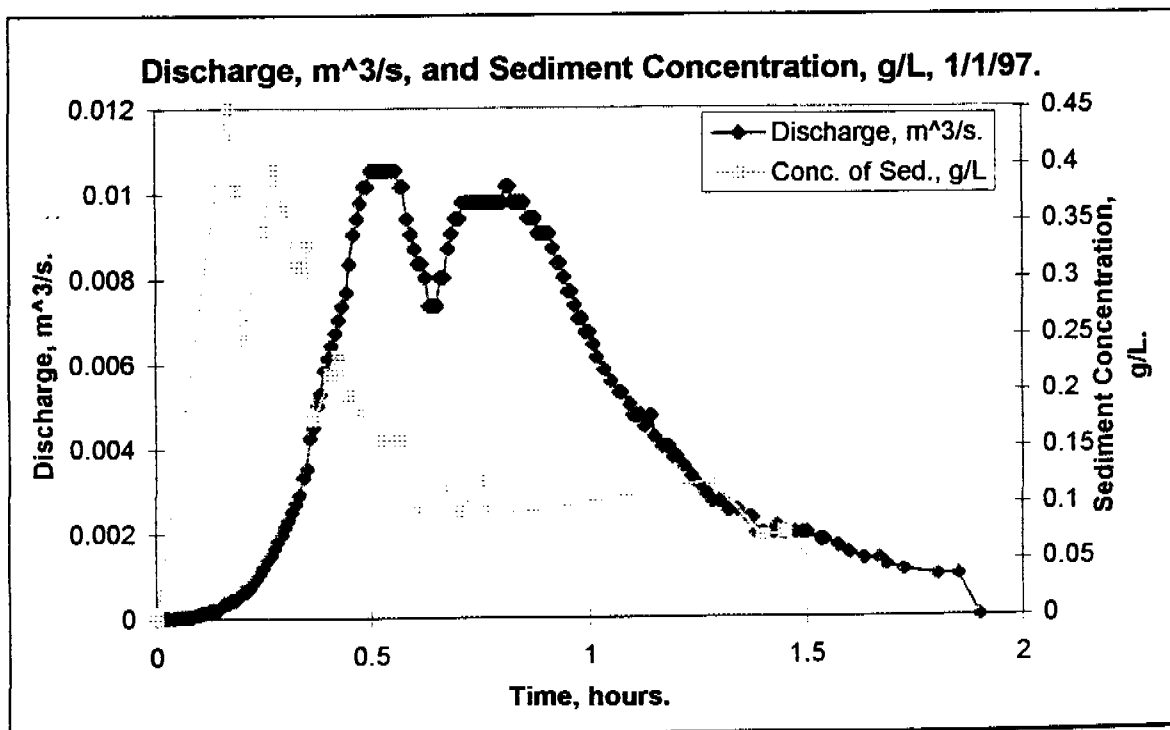


Figure 4.A.3: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the storm event occurring on the 1st January on the natural field plot.

12th January 1st Event

Table 4.A.2: Suspended sediment analysis for the first storm event occurring on the 12th January.

Site Name:			Pit 1				Base level 5 uS/cm				
Date:			12 Jan 1997								
Time of storm:			17:08:00								
			TIME	SAMPLE NUMBER	CONT. WEIGHT	CONT. + SED+H2O	COND/CT	CONT. + SED.	WATER	SED.	CONC. OF SED.
Hrs	min	sec			g	g	uS/cm	g	g	G	g/L
17	15	30	17:15:30	13	13.14	350.87	78.2	13.21	337.66	0.07	0.20730913
17	16	30	17:16:30	14	13.01	407.3	93.1	13.06	394.24	0.05	0.1268263
17	18	0	17:18:00	16	12.83	372.1	80.7	12.88	359.22	0.05	0.13919047
17	19	0	17:19:00	19	13.11	352.17	129.4	13.11	339.06	0	0
17	20	0	17:20:00	21	12.97	337.29	70.8	13.03	324.26	0.06	0.1850367
17	21	0	17:21:00	22	12.97	366.94	71.5	13.02	353.92	0.05	0.14127486
Total sed, g.										0.28	
Mean Conc.											0.13327291

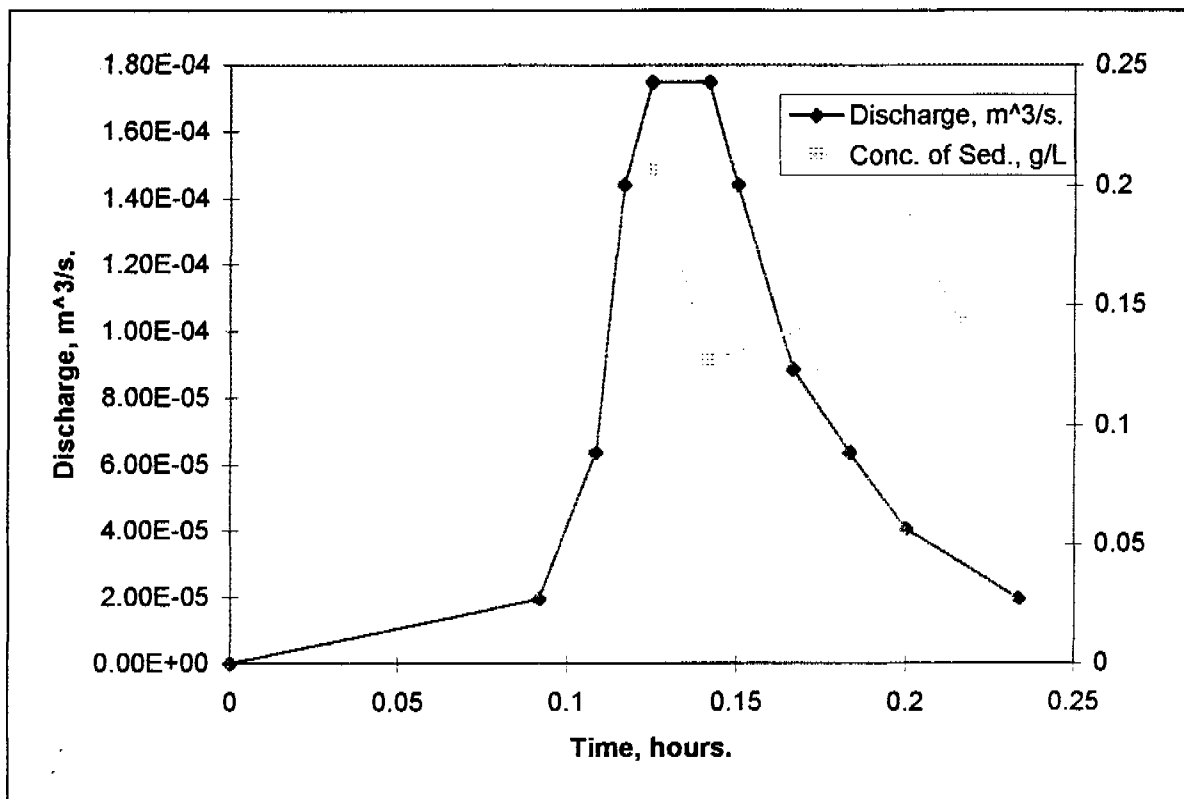


Figure 4.A.4: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the first storm event occurring on the 12th January on the natural field plot.

12th January 2nd Event

Table 4.A.3: Suspended sediment analysis for the second storm event occurring on the 12th January.

Site Name: Pit1					Base Level		2.4 uS/cm				
Date: 12th Jan 1997											
Time of storm: 18:30:00											
			TIME	SAMPLE NUMBER	CONT. WEIGHT	CONT. + SED+H2O	COND/CT	CONT. + SED.	WATER	SED.	CONC. OF SED.
hrs	mm	sec			g	g	uS/cm	g	g	G	g/L
17	54	30	17:54:30	26	12.93	308.22	106	13	295.22	0.07	0.23711131
17	55	30	17:55:30	27a	12.92	327.75	108.4	13	314.75	0.08	0.25416998
17	56	30	17:56:30	25	12.79	373.36	105.8	12.89	360.47	0.1	0.2774156
17	57	30	17:57:30	24	12.81	388.22	106.9	12.87	375.35	0.06	0.15985081
17	59	30	17:59:30	27b	12.85	390.85	90	12.92	377.93	0.07	0.18521949
18	0	30	18:00:30	28	12.6	384.04	84.2	12.74	371.3	0.14	0.3770536
18	1	30	18:01:30	32	12.67	394.53	76.5	12.72	381.81	0.05	0.13095519
18	3	30	18:03:30	31	12.71	411.72	70.7	12.78	398.94	0.07	0.17546498
18	5	30	18:05:30	20	12.83	425.43	56	12.87	412.56	0.04	0.09695559
18	7	30	18:07:30	30	12.53	432.25	45.9	12.59	419.66	0.06	0.14297288
18	9	30	18:09:30	17	12.81	440.56	37.6	12.84	427.72	0.03	0.07013934
18	12	30	18:12:30	10	12.84	455.97	28.7	12.86	443.11	0.02	0.04513552
18	15	30	18:15:30	22	12.83	425.43	56	12.87	412.56	0.04	0.09695559
18	19	30	18:19:30	11	12.73	437.02	42.2	12.79	424.23	0.06	0.14143271
18	22	30	18:22:30	12	13	429.97	44.6	13.04	416.93	0.04	0.09593937
18	27	30	18:27:30	15	12.92	407.88	51.4	12.95	394.93	0.03	0.07596283
Total sed. g										0.96	
Mean Conc. =										0.16017092	

Discharge, m³/s, and Sediment Concentration, g/L, 12/1/97
2nd Event.

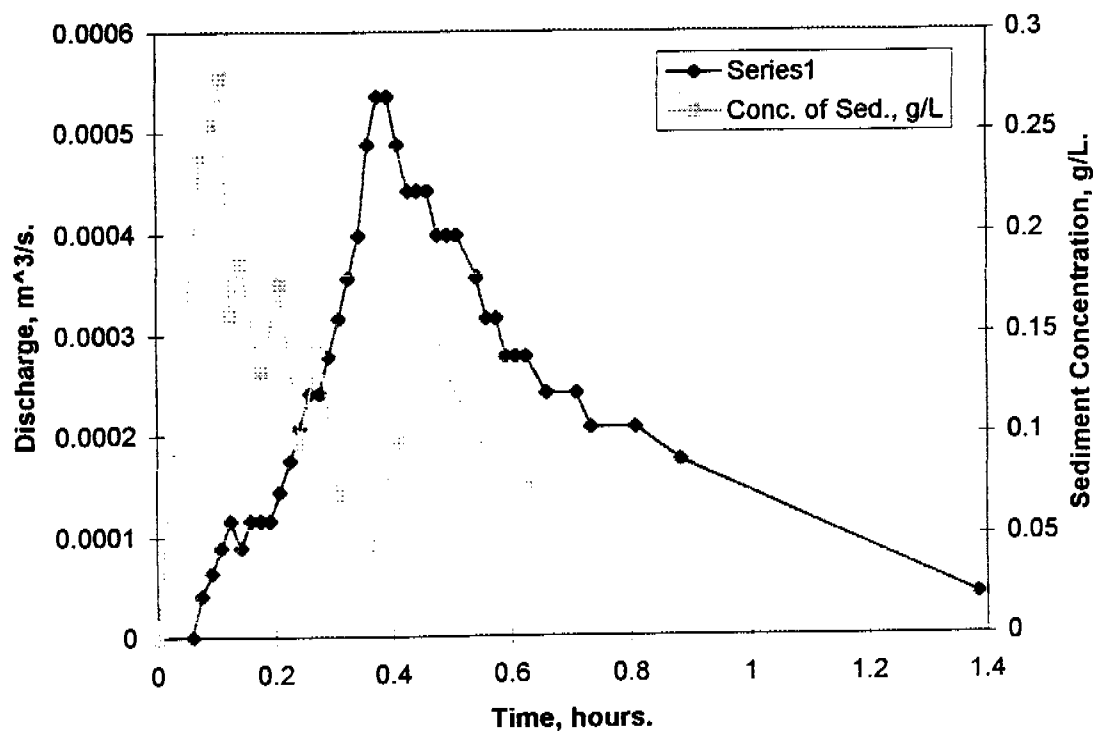


Figure 4.A.5: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the second storm event occurring on the 12th January on the natural field plot.

17th January

Table 4.A.4: Suspended sediment analysis for the storm event occurring on the 17th January.

Site Name: Pit 1			Base Level 5 uS/cm									
Date: 17 Jan 1997												
Time of storm: 16:54:00												
hrs	min	sec	TIME	SAMPLE NUMBER	CONT. WEIGHT	CONT. + SED+H2O	COND/CT	CONT. + SED.	WATER	SED.	CONC. OF SED.	COMMENTS
					g	g	uS/cm	g	g	G	g/L	
17	17	30	17:17:30	2	12.98	334.53	76.2	13.06	321.47	0.08	0.248856814	
17	19	0	17:19:00	17a	12.58	401.97	73.6	12.67	389.3	0.09	0.231184177	Sample 17a on sheet.
17	20	30	17:20:30	12A	12.89	431.29	11.1	13.03	418.26	0.14	0.334720031	
17	21	30	17:21:30	17B	12.78	419.11	35.9	12.91	406.2	0.13	0.320039389	Sample 17b on sheet.
17	23	0	17:23:00	19	12.69	433.04	29.5	12.84	420.2	0.15	0.35697287	
17	23	30	17:23:30	18	12.95	430.61	23.9	13.15	417.46	0.2	0.479087817	
17	24	30	17:24:30	22	12.84	442.08	25	12.94	429.14	0.1	0.233024188	
17	26	0	17:26:00	23	12.79	435.93	22	12.91	423.02	0.12	0.283674531	
17	27	30	17:27:30	21	12.78	413.71	19	13.04	400.67	0.26	0.648913071	Container + sed could be 12.87
17	29	30	17:29:30	26	12.58	426.1	14.2	12.75	413.35	0.17	0.411273739	Inferred Value.
17	31	30	17:31:30	12B	12.89	408.12	47.4	13.03	395.09	0.14	0.354349642	Labelled 12B.
17	33	30	17:33:30	11	12.93	421.38	9.02	13.07	408.31	0.14	0.342876736	
17	35	30	17:35:30	3	12.81	411.19	8.5	12.98	398.21	0.17	0.426910424	
17	37	30	17:37:30	20	12.76	365.37	11.5	12.83	352.54	0.07	0.198559029	
17	41	0	17:41:00	24	12.9	390.11	15.1	12.96	377.15	0.06	0.159087896	
17	43	0	17:43:00	1	12.97	393.85	12	13.06	380.79	0.09	0.236350745	
17	46	0	17:46:00	16	12.61	380.29	14.1	12.77	367.52	0.16	0.435350457	
17	50	30	17:50:30	15	12.89	342.49	33.4	13.02	329.47	0.13	0.394573102	
										Total Sed.	Mean Conc.	
										2.4	0.338655814	

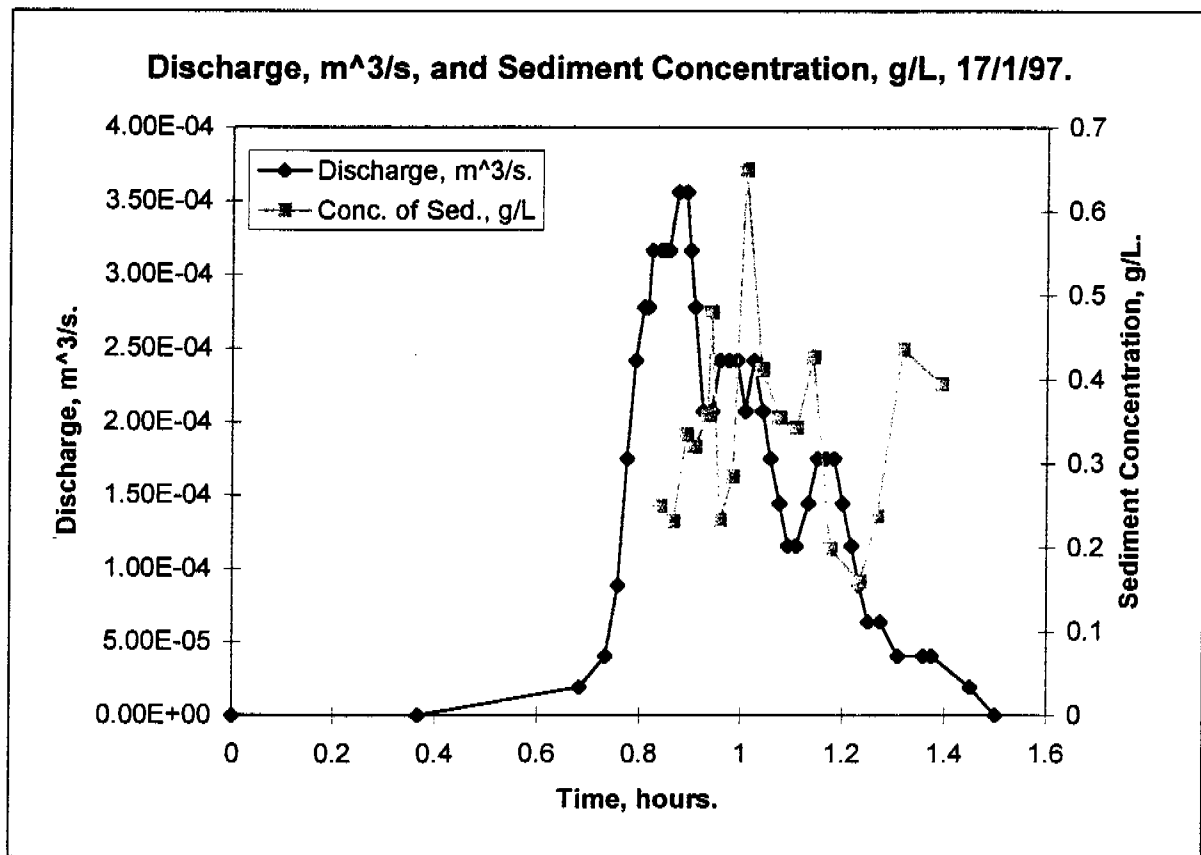


Figure 4.A.6: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the storm event occurring on the 17th January on the natural field plot.

21st January 1st Event

Table 4.A.5: Suspended sediment analysis for the first storm event occurring on the 21st January.

Site Name:			Pit1		Base Level 5 uS/cm						
Date:			21st Jan 1997								
Time of storm:			15:33:00								
			TIME	SAMPLE NUMBER	CONT. WEIGHT	CONT. + SED+H2O	COND/CT	CONT. + SED.	WATER	SED.	CONC. OF SED.
hrs	min	sec			g	g	uS/cm	g	g	G	g/L
15	43	30	15:43:30	8	12.85	360.05	115.5	12.85	347.2	0	0
15	44	30	15:44:30	11	12.73	366.87	100	12.77	354.1	0.04	0.112962
15	45	30	15:45:30	10	12.72	402.02	97.1	12.75	389.27	0.03	0.077067
15	46	30	15:46:30	6	12.82	408.74	70.5	12.86	395.88	0.04	0.101041
15	47	30	15:47:30	13	13.01	418.24	60.5	13.18	405.06	0.17	0.419691
15	48	30	15:48:30	28	12.82	437.3	50.8	12.93	424.37	0.11	0.259208
15	49	30	15:49:30	7	13.04	405.33	n/a	13.19	392.14	0.15	0.382516
15	50	30	15:50:30	14	12.89	400.89	23.7	13	387.89	0.11	0.283586
15	51	30	15:51:30	2	12.93	360.16	31.2	13.06	347.1	0.13	0.374532
15	52	30	15:52:30	27	12.91	364.85	27.6	12.99	351.86	0.08	0.227363
15	53	30	15:53:30	9	12.97	370.72	27	13.05	357.67	0.08	0.22367
15	54	30	15:54:30	5	12.94	358.67	30.2	13.01	345.66	0.07	0.202511
15	55	30	15:55:30	25	12.86	365.01	24.2	12.94	352.07	0.08	0.227228
15	57	30	15:57:30	31	12.99	344.14	37.3	13.06	331.08	0.07	0.211429
15	59	30	15:59:30	29	12.87	339.14	44.3	12.9	326.24	0.03	0.091957
16	3	0	16:03:00	26	12.86	341.39	48.4	12.91	328.48	0.05	0.152216
16	7	0	16:07:00	24	12.74	354.78	60.6	12.76	342.02	0.02	0.058476
16	13	0	16:13:00	32	12.87	330.49	61.2	12.91	317.58	0.04	0.125953
Tot sed, g										1.3	
mean=										0.196189	

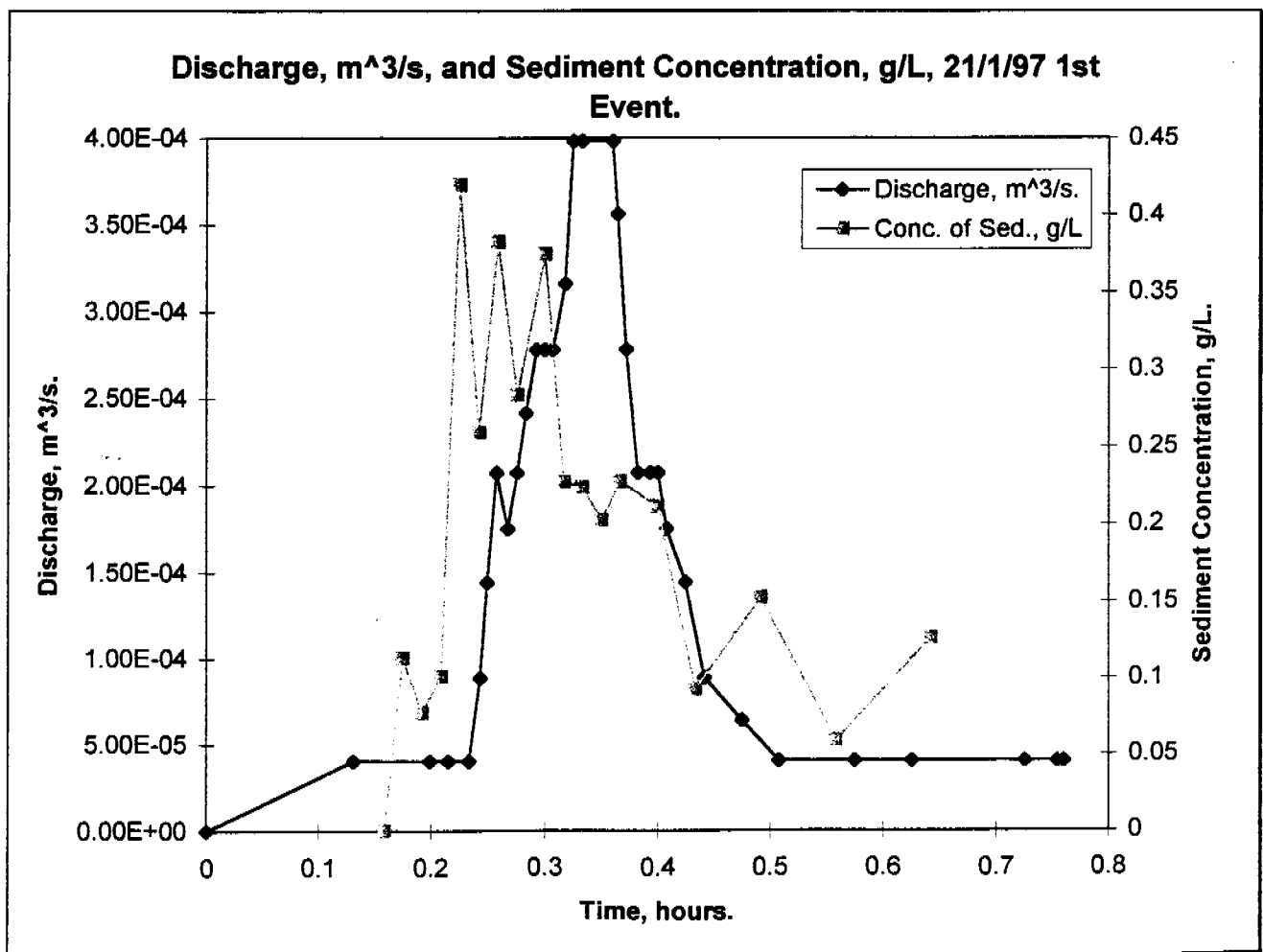


Figure 4.A.7: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the first storm event occurring on the 21st January on the natural field plot.

21st January 2nd Event

Table 4.A.6: Suspended sediment analysis for the second storm event occurring on the 21st January.

Site Name: Pit1			Base Level 5 uS/cm									
Date: 21st Jan 1997												
Time of storm: 16:57:00												
Hrs	min	sec	TIME	SAMPLE NUMBER	CONT. WEIGHT g	CONT. + SED+H2O g	COND/CT uS/cm	CONT. + SED. g	WATER g	SED. G	CONC. OF SED. g/L	
17	0	0	17:00:00	11	12.95	301.45	65.6	13	288.45	0.05	0.17334	Not Faded.
17	1	0	17:01:00	10	13.19	325.74	61.2	13.23	312.51	0.04	0.127996	
17	2	0	17:02:00	16	12.98	359.44	64.2	12.98	346.46	0	0	
17	3	0	17:03:00	14	13.08	380.83	62.8	13.12	367.71	0.04	0.108781	
17	4	0	17:04:00	12	12.97	362.94	50.4	12.99	349.95	0.02	0.057151	
17	5	0	17:05:00	15	12.98	379.69	34	13.04	366.65	0.06	0.163644	
17	6	0	17:06:00	17	13.02	364.92	24.4	13.13	351.79	0.11	0.312687	
17	7	0	17:07:00	30	12.93	358.52	18.6	13.05	345.47	0.12	0.347353	
17	8	0	17:08:00	23	12.94	363.61	39.6	12.94	350.67	0	0	Top of sheet.
17	9	0	17:09:00	21	13.07	424.31	9.2	13.16	411.15	0.09	0.218898	Non faded.
17	10	0	17:10:00	22	13.22	401.15	5.3	13.32	387.83	0.1	0.257845	
17	11	0	17:11:00	24	12.94	405.97	5.6	13.01	392.96	0.07	0.178135	
17	12	0	17:12:00	19	13.14	415.1	5.1	13.21	401.89	0.07	0.174177	
17	13	0	17:13:00	18	12.81	402.91	6.1	12.84	390.07	0.03	0.076909	
17	14	0	17:14:00	27	12.78	391.61	6.3	12.82	378.79	0.04	0.105599	
17	15	0	17:15:00	32	12.94	384.69	7.3	12.99	371.7	0.05	0.134517	
17	16	0	17:16:00	26	13	390.2	8.2	13.02	377.18	0.02	0.053025	
17	17	0	17:17:00	20	12.91	370.19	9.6	12.94	357.25	0.03	0.083975	
17	18	0	17:18:00	28	13.32	414.92	9.6	13.32	401.6	0	0	
17	19	0	17:19:00	31	12.87	398.38	20.7	12.91	385.47	0.04	0.103769	
17	20	30	17:20:30	25	13	395.92	12.3	13.01	382.91	0.01	0.026116	Non faded.
17	22	0	17:22:00	29	12.68	396.51	14.2	12.68	383.83	0	0	Non faded.
17	24	0	17:24:00	13	12.79	400.96	13.1	12.79	388.17	0	0	
17	26	0	17:26:00	29	12.96	403.75	16.3	12.97	390.78	0.01	0.02559	Faded.
17	28	0	17:28:00	11	13.06	392.56	16.3	13.07	379.49	0.01	0.026351	Faded.
17	30	0	17:30:00	31	12.91	417.52	10.4	12.92	404.6	0.01	0.024716	Faded.
17	32	0	17:32:00	21	12.98	379.69	21.9	12.98	366.71	0	0	Faded.
17	36	0	17:36:00	23	12.76	343.04	28.2	12.76	330.28	0	0	Approx zero grams.
17	40	0	17:40:00	28	12.96	367.46	28.2	12.97	354.49	0.01	0.02821	
17	46	0	17:46:00	19	12.95	342.8	30.5	12.98	329.82	0.03	0.090959	Faded.
17	52	0	17:52:00	29	12.96	403.75	16.3	12.97	390.78	0.01	0.02559	Faded.
18	0	0	18:00:00	4	12.92	361.19	41.3	12.96	348.23	0.04	0.114867	
18	6	0	18:06:00	25	12.92	372.72	43.8	12.93	359.79	0.01	0.027794	Faded.
18	20	0	18:20:00	24	12.94	405.97	5.6	13.01	392.96	0.07	0.178135	Faded.
Tot Sed.g										1.19		
Mean Conc.										0.095474		
Extras										0.02	0.051787	Faded.
				20	12.95	399.17	55.6	12.97	386.2			

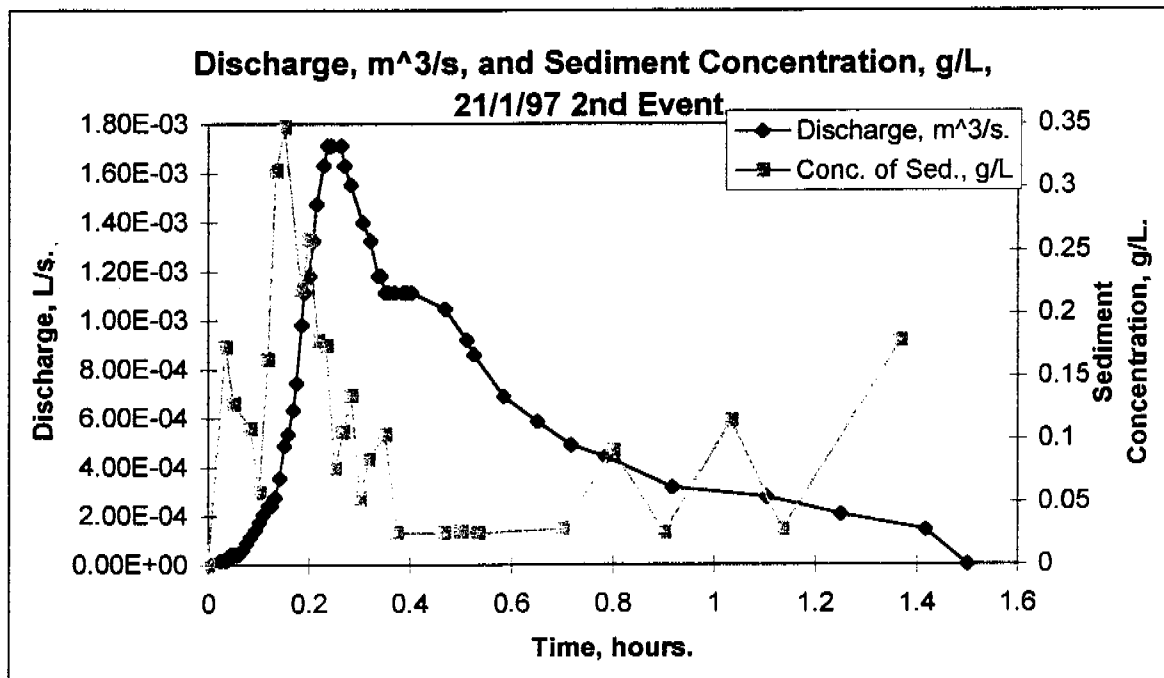


Figure 4.A.8: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the second storm event occurring on the 21st January on the natural field plot.

23rd January

Table 4.A.7: Suspended sediment analysis for the storm event occurring on the 23rd January.

Site Name: Pit 1			Base Level 5 uS/cm									
Date: 23 Jan 1997												
Time	of	16:20:00	TIME	SAMPLE	CONT.	CONT. +	COND'CT	CONT. +	WATER	SED.	CONC. OF	
storm:				NUMBER	WEIGHT	SED+H2O		SED.			SED.	
hrs	min	sec			g	g	uS/cm	g	g	G	g/L	
16	28	30	16:28:30	13	12.92	376.73	31.3	13.06	363.67	0.14	0.384964	
16	30	0	16:30:00	25	13.18	403.33	20.8	13.31	390.02	0.13	0.333316	
16	31	0	16:31:00	31	12.9	412.18	15.4	13.06	399.12	0.16	0.400882	
16	32	0	16:32:00	23	13.01	426.27	10.4	13.13	413.14	0.12	0.290458	
16	33	0	16:33:00	14	12.76	429.4	9.3	12.88	416.52	0.05	0.120042	
16	34	0	16:34:00	19	12.79	427.57	8	12.89	414.68	0.1	0.24115	
16	35	0	16:35:00	20	12.83	406.71	8	13.01	393.7	0.18	0.457201	
16	36	0	16:36:00	29	13.17	419.07	8.3	13.3	405.77	0.13	0.320379	
16	36	30	16:36:30	16	12.79	412.23	7	12.86	399.37	0.07	0.175276	
16	37	30	16:37:30	21	12.8	414.18	21.6	12.84	401.34	0.04	0.099666	
16	38	30	16:38:30	27	13.02	432.72	4.6	13.11	419.61	0.09	0.214485	
16	39	30	16:39:30	24	13.06	411.97	4.2	13.1	398.87	0.04	0.100283	
16	40	30	16:40:30	28	12.9	448.76	4.3	12.94	435.82	0.04	0.091781	
16	41	30	16:41:30	30	12.74	431.22	4.5	12.75	418.47	0.01	0.023897	
16	42	30	16:42:30	17	12.77	454.55	5.3	12.78	441.77	0.01	0.022636	
16	43	30	16:43:30	32	12.71	408.26	21.8	12.68	395.58	-0.03	-0.07584	approx zero
16	44	30	16:44:30	15	13.06	405.71	34.3	13.09	392.62	0.03	0.07641	faded not on raw
16	46	0	16:46:00	26	12.99	418.45	30.5	13.02	405.43	0.03	0.073996	
16	47	0	16:47:00	22	13.01	451.18	34.2	13.02	438.16	0.01	0.022823	
16	48	0	16:48:00	67					0	0		Not on weigh sheet
16	49	0	16:49:00	63	12.76	428.1	10.4	12.76	415.34	0	0	
16	50	0	16:50:00	70	12.7	424.16	11.7	12.68	411.48	-0.02	-0.04861	
16	51	0	16:51:00	66	12.95	430.5	12.9	12.95	417.55	0	0	
16	52	0	16:52:00	64	12.92	433.23	15.1	12.93	420.3	0.01	0.023793	
16	53	0	16:53:00	65	12.98	397.89	15.9	12.99	384.9	0.01	0.025981	
16	54	0	16:54:00	60	12.95	421.39	17	12.98	408.41	0.03	0.073456	
16	55	0	16:55:00	61	12.83	424.01	16.3	12.83	411.18	0	0	
16	56	0	16:56:00	68	12.78	392.88	18	12.78	380.1	0	0	
16	57	0	16:57:00	62	12.95	421.39	20	12.96	408.43	0.01	0.024484	
16	58	30	16:58:30	32	12.71	408.26	21.8	12.68	395.58	-0.03	-0.07584	Approx zero
17	0	0	17:00:00	16	12.93	411.07	26.3	12.95	398.12	0.02	0.050236	
17	1	30	17:01:30	26	13.01	454.02	131	13.04	440.98	0.03	0.06803	Exchange with ss26
17	3	0	17:03:00	9	12.83	427.96	28.7	12.86	415.1	0.03	0.072272	
17	4	30	17:04:30	15	12.87	390.15	8.2	12.9	377.25	0.03	0.079523	another 15
17	6	0	17:06:00	1	12.79	261.9	33.8	12.77	249.13	-0.02	-0.08028	
17	8	0	17:08:00	18	12.72	422	50.8	12.68	409.32	-0.04	-0.09772	Approx zero
17	10	0	17:10:00	30	12.89	412.79	30.9	12.9	399.89	0.01	0.025007	box 2
17	12	0	17:12:00	13	12.83	400.54	34	12.84	387.7	0.01	0.025793	box 2 12 or 13
17	14	0	17:14:00	13	13.16	408.08	35.3	13.17	394.91	0.01	0.025322	box2
17	17	0	17:17:00	28	13.07	414.35	38.7	13.1	401.25	0.03	0.074766	box 2
17	21	0	17:21:00	29	12.93	381.28	41.7	12.94	368.34	0.01	0.027149	box2
17	25	0	17:25:00	25	12.98	458.28	43.6	13	445.28	0.02	0.044916	box 2
17	30	0	17:30:00	10	13.1	389.09	50.5	13.13	375.96	0.03	0.077996	box2
17	35	0	17:35:00	23	13.13	400.82	49.9	13.15	387.67	0.02	0.05159	box2
17	52	0	17:52:00	15	12.88	405.6	55.8	12.9	392.7	0.02	0.050929	box 2
17	58	0	17:58:00	11	13.07	373.7	58.9	13.1	360.6	0.03	0.083195	box2
											1.6	
											Corrected 1.77	
											Mean conc. =	0.08647
											Corrected (with -ve's taken out)	0.096422

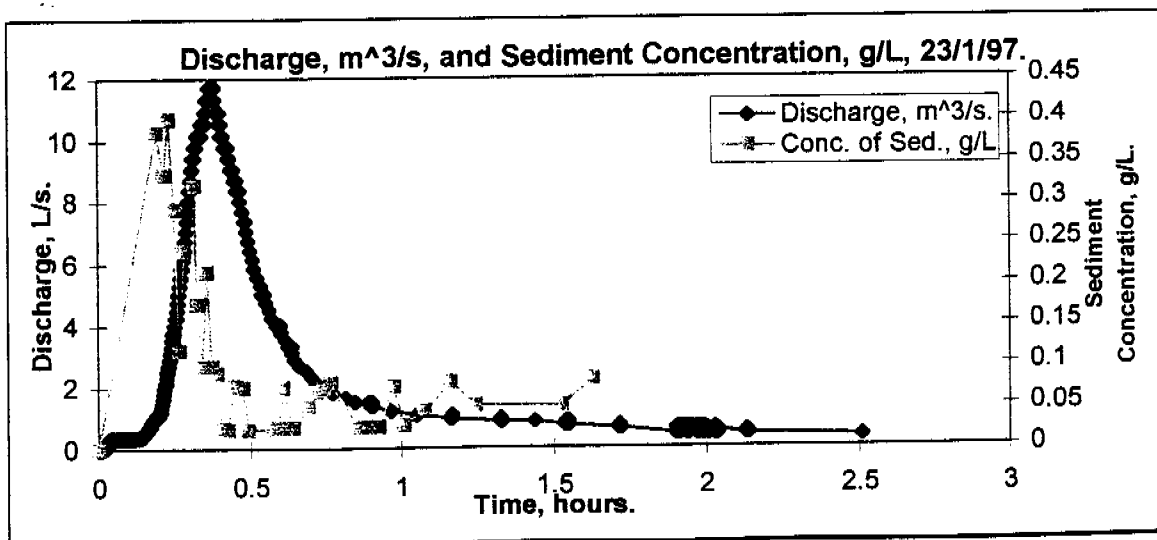


Figure 4.A.9: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the storm event occurring on the 23rd January on the natural field plot.

28th January

Table 4.A.8: Suspended sediment analysis for the storm event occurring on the 28th January.

Site Name:			Pit1		Base Level		5 uS/cm				
Date:			28th Jan 1997								
Time of storm:			13:05:00								
			TIME	SAMPLE NUMBER	CONT. WEIGHT	CONT. + SED+H2O	CONDCT	CONT. + SED.	WATER	SED.	CONC. OF SED.
hrs	min	sec			g	g	uS/cm	g	g	G	g/L
13	9	30	13:09:30	24	13.07	408.55	39	13.15	395.4	0.08	0.202326758
13	10	30	13:10:30	21	13.13	433.8	48.7	13.21	420.59	0.08	0.190208992
13	11	30	13:11:30	14	12.83	453.87	36	12.93	440.94	0.1	0.226788225
13	12	30	13:12:30	5	12.88	443.42	35.6	12.94	430.48	0.06	0.139379298
13	13	30	13:13:30	17	12.77	452.45	31.5	12.85	439.6	0.08	0.181983621
13	14	30	13:14:30	8	12.83	422.06	28.5	12.91	409.15	0.08	0.195527313
13	15	30	13:15:30	22	12.61	457.7	26.7	12.69	445.01	0.08	0.179771241
13	16	30	13:16:30	18	12.65	443.72	16.1	12.8	430.92	0.15	0.348092453
13	17	30	13:17:30	19	12.8	456.36	21.7	12.94	443.42	0.14	0.315727752
13	18	30	13:18:30	23	13.09	432.62	9.7	13.27	419.35	0.18	0.429235722
13	19	30	13:19:30	31	12.84	443.92	15.6	12.9	431.02	0.06	0.139204677
13	20	30	13:20:30	32	12.69	402.91	14.5	12.74	390.17	0.05	0.128149268
13	21	30	13:21:30	31 faded	13.1	414.19	10.9	13.15	401.04	0.05	0.124675843
13	22	30	13:22:30	29	13.12	457.04	14.4	13.15	443.89	0.03	0.067584311
13	23	30	13:23:30	15	13.07	428.26	10.6	13.11	415.15	0.04	0.096350717
13	24	30	13:24:30	9	12.67	451.02	11	12.7	438.32	0.03	0.068443147
13	25	30	13:25:30	16	12.8	444.07	16.2	12.77	431.3	-0.03	-0.069557153
13	26	30	13:26:30	2	12.69	446.74	12.8	12.73	434.01	0.04	0.092163775
13	27	30	13:27:30	3	13.11	434.97	9.9	13.21	421.76	0.1	0.237101669
13	28	30	13:28:30	1	13.17	416.53	9.3	13.2	403.33	0.03	0.07438078
13	29	30	13:29:30	7	12.58	430.66	17.2	12.61	418.05	0.03	0.071761751
13	30	30	13:30:30	10	12.73	444.44	10.5	12.75	431.69	0.02	0.046329542
13	32	0	13:32:00	11	12.72	439.99	17.5	12.73	427.26	0.01	0.023404952
13	33	0	13:33:00	12	12.69	446.74	12.8	12.71	434.03	0.02	0.046079764
13	34	0	13:34:00	4	12.77	429.51	13.7	12.82	416.69	0.05	0.11999328
13	36	0	13:36:00	20	12.83	444.01	20.6	12.84	431.17	0.01	0.023192708
13	39	0	13:39:00	28	12.84	441.27	25.3	12.84	428.43	0	0
13	42	0	13:42:00	25	12.74	449.48	31.6	12.75	436.73	0.01	0.022897442
13	45	0	13:45:00	27	12.81	417.47	36.8	12.83	404.64	0.02	0.049426651
13	50	0	13:50:00	6	12.58	414.55	43.7	12.59	401.96	0.01	0.024878097
										Total	mean=
										1.61	0.126516753
										Corrected	1.61 0.126815

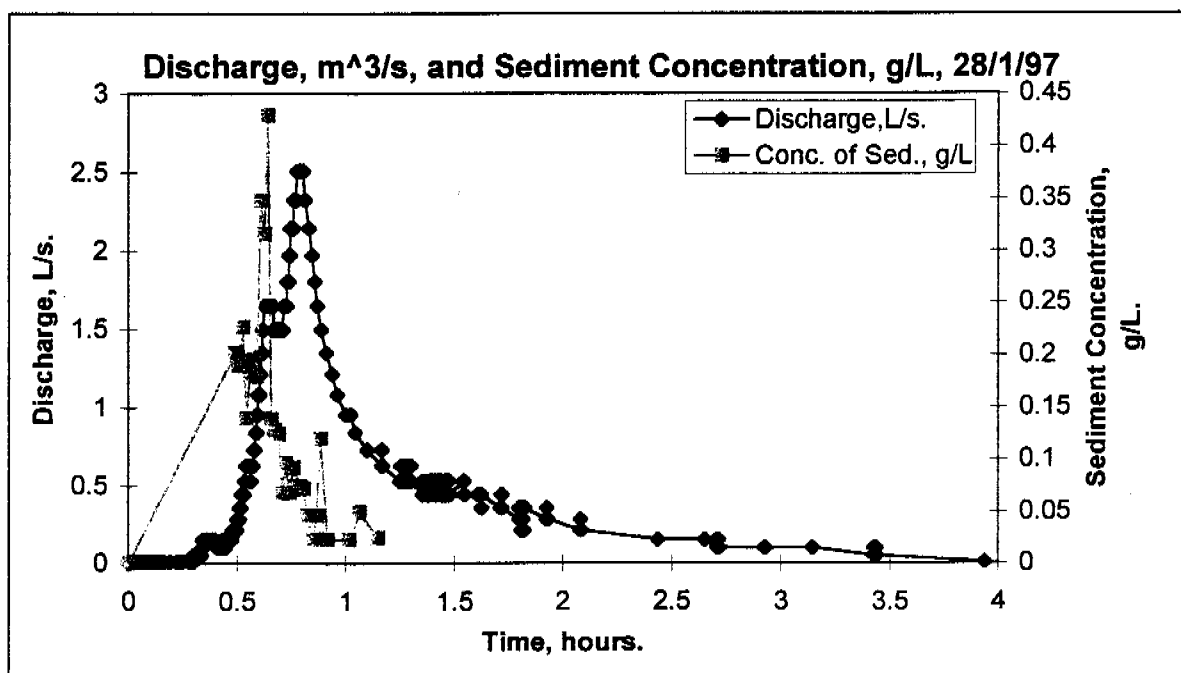


Figure 4.A.10: Plot of the discharge, (m³/s), and suspended sediment concentration, (g/L), for the storm event occurring on the 23rd January on the natural field plot.

Bedload Sediment Data

Table 4.A.9: Collected bedload sediment data from natural field plot over 1996/1997 wet season.

Sample Name.	Container Mass.	Sediment + Container.	Sediment.
19/12/96			
1	12.8	18.84	6.04
2	12.87	69.89	57.02
3	12.92	661.19	648.27
		Total Bedload Mass=	711.33
21/12/96			
1	12.78	17.82	5.04
2	12.68	242	229.32
		Total Bedload Mass=	234.36
24/12/96			
1	12.9	15.65	2.75
2	12.77	359.3	346.53
3	12.76	442.96	430.2
		Total Bedload Mass=	779.48
26-27/12/97			
1	12.67	460.82	448.15
2	12.65	1406	1393.35
		Total Bedload Mass=	1841.5
1/1/97 Before Event			
1	12.79	107.66	94.87
2	12.76	82.93	70.17
3	12.73	16.41	3.68
4	12.86	143.45	130.59
5	12.63	157.41	144.78
		Total Bedload Mass=	444.09
1/1/97 After Event.			
1	12.89	13.6	0.71
2	12.69	25.06	12.37
3	12.72	189.06	176.34
4	12.95	226.96	214.01
5	12.8	493.39	480.59
6	12.66	111.85	99.19
7	12.86	942.85	929.99
		Total Bedload Mass=	1913.2
2/01/97			
1	12.82	50.62	37.8
2	12.92	12.92	0
3	12.94	376.06	363.12
4	12.6	85.17	72.57
5	12.76	993.85	981.09
		Total Bedload Mass=	1454.58
4/01/97			
1	12.79	13.4	0.61
2	12.83	13.54	0.71
3	12.89	14.14	1.25
4	12.95	13.88	0.93
5	12.9	348.78	335.88
		Total Bedload Mass=	339.38
6/01/97			
1	12.74	99.77	87.03
2	12.81	14.65	1.84
3	12.93	13.91	0.98
4	12.73	12.99	0.26
		Total Bedload Mass=	90.11
7/01/97			
1	12.87	13.28	0.41
2	12.93	13.32	0.39
3	13	15.15	2.15
4	13.1	183.77	170.67
		Total Bedload Mass=	173.62
8/1/97 10am			
1	12.82	13.22	0.4
2	12.83	44.26	31.43
3	12.77	24.4	11.63
		Total Bedload Mass=	43.46
10/01/97			
1	12.79	13.02	0.23
2	12.83	13.02	0.19
3	12.88	13.09	0.21
4	12.87	13.63	0.76
5	12.83	128.33	115.5
		Total Bedload Mass=	116.89
11/1/97 6.30pm			
1	12.66	12.84	0.18
2	12.58	12.74	0.16
3	12.59	12.77	0.18
4	12.66	13.12	0.46
5	12.76	12.9	0.14
6	12.52	12.8	0.28
7	12.51	12.65	0.14
8	12.44	12.57	0.13
9	12.48	54.21	41.73
10	12.45	308.7	296.25
		Total Bedload Mass=	339.65

Table 4.A.9: (Continued) Collected bedload sediment data from natural field plot over 1996/1997 wet season.

Sample Name	Container Mass	Sediment + Container	Sediment
12/1/97 4pm			
1	12.54	13.33	0.79
2	12.39	47.84	35.45
3	12.55	14.79	2.24
4	12.56	15	2.44
5	12.49	101.78	89.29
6	12.89	13.34	0.45
7	12.85	682.24	669.39
8	12.9	84.68	71.78
		Total Bedload Mass=	871.83
12/1/97 5.30pm			
1	12.78	13.67	0.89
2	12.75	13.18	0.43
3	12.66	12.89	0.23
4	12.63	12.84	0.21
5	12.7	782.02	769.32
		Total Bedload Mass=	771.08
12/1/97 6.30pm			
1	12.84	41.58	28.74
2	12.88	13.96	1.08
3	12.86	13.16	0.3
4	12.86	48.04	35.18
		Total Bedload Mass=	65.3
16/01/97			
1	12.86	17.13	4.27
2	12.66	13.53	0.87
3	12.6	228.85	216.25
		Total Bedload Mass=	221.39
17/1/97 5.30pm			
1	12.92	13.85	0.93
2	13.02	177.44	164.42
3	12.98	144.44	131.46
4	29.49	35.4	5.91
		Total Bedload Mass=	302.72
19/1/97 5pm			
1	29.41	30.91	1.5
2	12.74	248.94	236.2
		Total Bedload Mass=	237.7
21/1/97 Storm 1			
1	28.25	220.92	192.67
2	28.8	219.5	190.7
3	12.89	59.89	47
		Total Bedload Mass=	430.37
21/01/97			
1	12.89	13.28	0.39
2	12.8	154.72	141.92
3	12.73	13.75	1.02
4	12.86	41.82	28.96
		Total Bedload Mass=	172.29
23/01/97			
1	29.44	31.45	2.01
2	29.64	1173.1	1143.46
		Total Bedload Mass=	1145.47
23/01/97			
1	28.68	36.94	8.26
2	28.53	255.02	226.49
		Total Bedload Mass=	234.75
24/01/97			
1	28.38	31.58	3.2
2	12.82	407.73	394.91
		Total Bedload Mass=	398.11
27/01/97			
1	29.63	296.01	266.38
		Total Bedload Mass=	266.38
28/01/97			
1	28.56	34.29	5.73
2	28.6	71.49	42.89
3	28.64	57.3	26.66
4	28.51	319.75	291.24
		Total Bedload Mass=	368.52
1/02/97			
1	28.66	30.24	1.58
2	12.53	13.56	1.03
3	12.55	153.61	141.06
4	12.77	144.06	131.29
		Total Bedload Mass=	274.96

Appendix 4.B

Particle Size Analysis.

Figure 4.B.1, illustrates the position of all of the particle size analysis samples that were collected from the natural field plot.

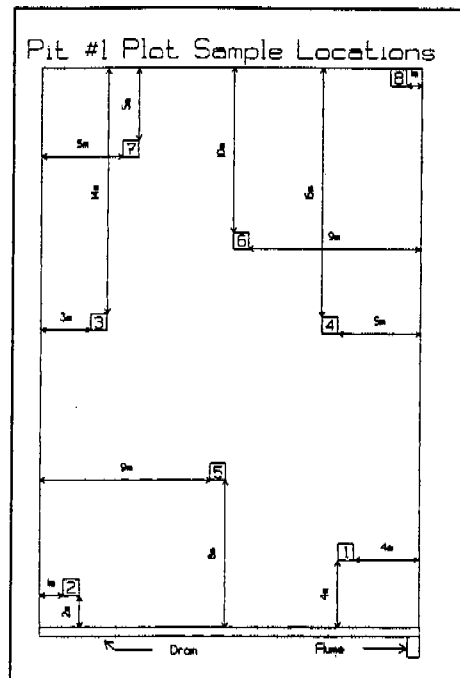


Figure 4.B.1: Distribution of particle size samples from the natural site, (Smith, 1997).

The average particle size distribution over all the samples collected, Smith (1997), is illustrated in Figure 4.B.2.

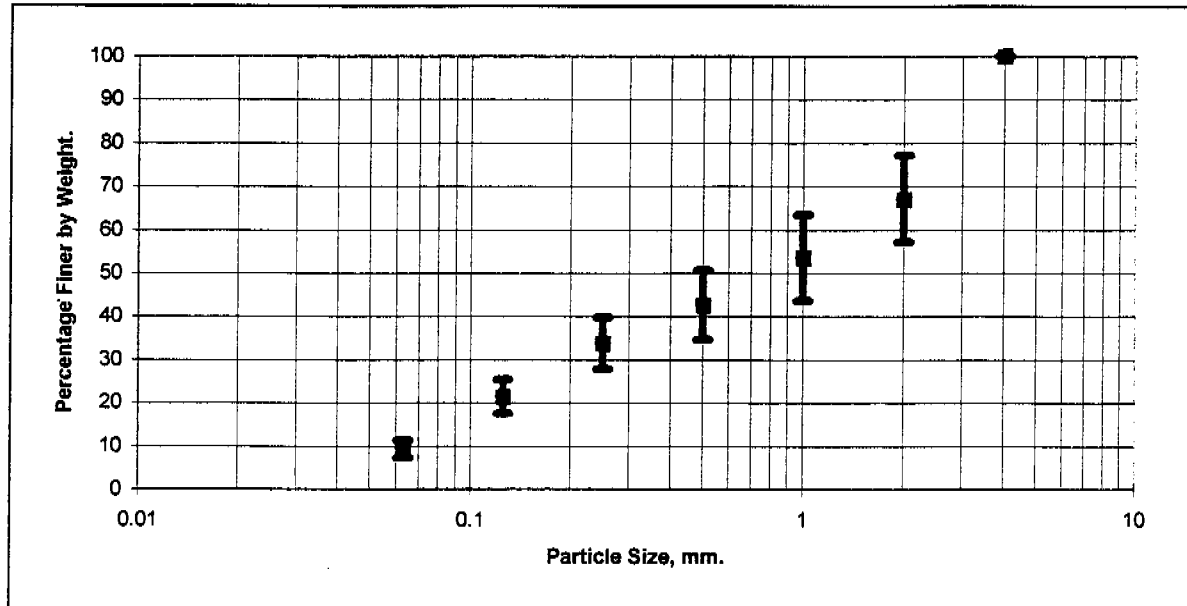


Figure 4.B.2: Average percentage finer particle size analysis derived from samples collected from a random number of locations around the natural field plot.

The d_{50} for the natural site was determined to be approximately 0.8 mm, which is comparable to that reported for the cap and batter sites.

Appendix 4.C

Regression Analysis For Overland Flow Erosion and Total Sediment Loss Models.

Table 4.C.1: Log-Log regression analysis for the overland flow erosion model, Section 4.3.

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R	0.859162116					
R Square	0.738159541					
Adjusted R Square	0.736600967					
Standard Error	0.358506217					
Observations	170					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	60.87180068	60.87180068	473.6120737	9.30572E-51	
Residual	168	21.59248694	0.128526708			
Total	169	82.46428762				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Log10(K)	-0.929432869	0.027974295	-33.22453227	9.37168E-76	-0.984659319	-0.87420642
m1	0.853360152	0.039212179	21.76263021	9.30572E-51	0.775948034	0.930772271

Table 4.C.2: Log-Log regression analysis for the total sediment loss model, Section 4.3.

Log regression analysis for the total sediment loss model, Section 4.3.

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.999718938					
R Square	0.999437955					
Adjusted R Square	0.999250607					
Standard Error	0.01799414					
Observations	5					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	1	1.727301869	1.727301869	5334.651495	5.65612E-06	
Residual	3	0.000971367	0.000323789			
Total	4	1.728273236				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Log 10(K)	-0.822985506	0.052293776	-15.73773345	0.000557657	-0.989407795	-0.656563216
Log 10(Total of $\int(Q^m)dt$)	0.996980202	0.013650027	73.03869861	5.65612E-06	0.953539683	1.04042072