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19 May 2011

The Honourable Justice Holmes

Queensland Floods Commission of Inquiry

Your Honour,

**Supplementary Submission regarding
Implementation of systems operations for dams
Response to the 2011 flood
Brisbane flood mitigation strategies for the coming summer**

I was dismayed to yesterday hear Mark Babister state he had not seen any modeling to show that earlier release from Wivenhoe would have prevented Brisbane being flooded, because he apparently has not been shown the spreadsheet submitted by Mr Ian Chalmers electronically and on disc handed to your staff on 3 May 2011, when they and Mr Callagan were explained the significance of the spreadsheet. Mr Chalmers was the Supervising Engineer on the construction of Wivenhoe Dam, and therefore is intimately familiar with the physical operation of the dam, and knows how it was intended to be operated to mitigate flooding of Brisbane.

To ensure this spreadsheet receives yours and the other Commissioners' attention I have attached it hereto, and explain that it reveals that if Wivenhoe's Full Supply Level had been maintained from Thursday 6 January 2011, with the gates progressively opened to discharge inflows, until nuisance flooding commenced in Brisbane, and only then the lake level being allowed to rise, it would have peaked below 74mAHD. There would have been no major flooding of Brisbane, and Wivenhoe would have achieved its objective of avoiding a repetition of 1974.

Instead, the Flood Control Engineers (FCEs) ignored BOM's 5 January 2011 warning of the impending arrival of the intense rainfall high-level low-pressure system, and the separate monsoon front, and allowed the lake to rise to 140% on Sunday 9 January, before the low-pressure system swept through, followed 12 hours later by the monsoon front. Wivenhoe could have accommodated the twin peaks, if it had been at the FSL before the low-pressure system arrived.

I am also dismayed at the deceptive evidence of the Flood Control Engineers and the Dam Safety Officer who assert that the fuse plugs have not reduced Wivenhoe's flood mitigation capacity. Please understand that the plugs will commence to be eroded out if the lake rises above 75.7mAHD, and once the first plug is gone the lake will discharge through that opening, which has a base of 67mAHD, the current FSL. To avoid this the Manual requires the FCEs to discharge sufficiently to prevent the lake rising above 74mAHD – effectively limiting Wivenhoe's capacity to hold water and mitigate flooding to 74mAHD, which is 190% of the FSL. Please see my Supplementary Submission of 26 April 2011 for a more detailed explanation.

Ian Chalmers submitted spreadsheet is based on discharge of 4000cumecs, but to allow for the additional discharge from the Bremer River and Lockyer Creek, he has prepared a further spreadsheet to demonstrate that if Wivenhoe's discharge was capped at 3500cumecs, it still would not have risen above 74mAHD. He is flying overseas tomorrow, but can be contacted by email on [REDACTED]

To avoid a repetition of last January's flooding this coming summer, until there has been a full evaluation of the event, I respectfully suggest that Wivenhoe Dam be subject to the following interim flood control strategies:

1. The capacity of Wivenhoe is recognized to be 190% of the FSL, when the FSL is 67mAHD.
2. That capacity be notionally allocated 90% to water supply, 90% to flood mitigation, and 10% to a buffer between the two.
3. Whenever the lake rises above 90% it is discharged back to 90% in such a way as to try and avoid inconveniencing the population near to Wivenhoe.
4. If the lake rises to 100%, any excess above 100% is discharged forthwith, even if such discharge inconveniences the population below Wivenhoe, until the flow past Moggil reaches 4000cumecs. If such measure is unavailable, discharge of 3500cumecs from Wivenhoe be substituted.
5. When the flow past Moggil reaches 4000cumecs, the gate openings be maintained at that rate, and the lake be allowed to rise.
6. Using the BOM long and short-term rain forecasts, the gates will be opened to prevent the lake exceeding 74mAHD.

I am available at any time to elaborate on any of the above.

Yours sincerely,

David Stark

Date	Period	FLOOD FLOWS			END Water Level (A.H.D.)		At end of period Gate Openings (Metres x Vertical)					Average Period Discharge (Cumecs)
		Inflow (Cumecs)	Historical Releases (Cumecs)	"Optimal" Releases (Cumecs)								
6/01/2011	Start 09.00				67.32							
6/01/2011	09.00/10.00	406	0	71	67.33	Water Level>67.00. Open 5 gates to 0.25m each,in sequence	0.25	0.25	0.25	0.25	0.25	71
	10.00/11.00	177	0	125	67.33	Decide at period end to LEAVE AS SET	0.25	0.25	0.25	0.25	0.25	125
Thursday	11.00/12.00	177	0	125	67.33	Decide at period end to LEAVE AS SET	0.25	0.25	0.25	0.25	0.25	125
	12.00/13.00	406	0	125	67.34	Decide at period end to LEAVE AS SET	0.25	0.25	0.25	0.25	0.25	125
	13.00/14.00	177	0	125	67.35	Decide at period end to LEAVE AS SET	0.25	0.25	0.25	0.25	0.25	125
	14.00/15.00	152	0	125	67.35	Decide at period end to LEAVE AS SET	0.25	0.25	0.25	0.25	0.25	125
	15.00/16.00	534	0	125	67.36	Water Level >67.00 &Rising; RESET GATES IN SEQUENCE to 0.5m	0.25	0.25	0.25	0.25	0.25	125
	16.00/17.00	330	0	193	67.36		0.50	0.50	0.50	0.50	0.50	193
	17.00/18.00	355	0	248	67.37	LEAVE AS SET	0.50	0.50	0.50	0.50	0.50	248
	18.00/19.00	355	0	248	67.37		0.50	0.50	0.50	0.50	0.50	248
	19.00/20.00	355	0	248	67.38		0.50	0.50	0.50	0.50	0.50	248
	20.00/21.00	355	0	248	67.38		0.50	0.50	0.50	0.50	0.50	248
	21.00/22.00	305	0	248	67.38		0.50	0.50	0.50	0.50	0.50	248
Thursday	22.00/23.00	660	0	249	67.39	Water Level >67.00 &Rising; RESET GATES IN SEQUENCE to 0.75m	0.50	0.50	0.50	0.50	0.50	249
	23.00/24.00	1047	0	316	67.42		0.75	0.75	0.75	0.75	0.75	316
7/01/2011	00.00/01.00	798	0	371	67.43	Water Level >67.00 &Rising; RESET GATES IN SEQUENCE to 1.00m	0.75	0.75	0.75	0.75	0.75	371
	01.00/02.00	800	0	435	67.44		1.00	1.00	1.00	1.00	1.00	435
	02.00/03.00	980	0	493	67.46	Water Level >67.00 &Rising; RESET GATES IN SEQUENCE to 1.50m	1.00	1.00	1.00	1.00	1.00	493
Friday	03.00/04.00	1135	0	623	67.48		1.50	1.50	1.50	1.50	1.50	623
	04.00/05.00	1324	0	731	67.50	Water Level >67.00 &Rising; RESET GATES IN SEQUENCE to 2.50m	1.50	1.50	1.50	1.50	1.50	731
	05.00/06.00	1109	0	982	67.50		2.50	2.50	2.50	2.50	2.50	982
	06.00/07.00	1134	0	1186	67.50	Water Level >67.00 &Rising?; RESET GATES IN SEQUENCE to 4.00m	2.50	2.50	2.50	2.50	2.50	1186
	07.00/08.00	1167	0	1526	67.49		4.00	4.00	4.00	4.00	4.00	1526
	08.00/09.00	864	0	1814	67.46		4.00	4.00	4.00	4.00	4.00	1814
	09.00/10.00	1648	0	1812	67.45		4.00	4.00	4.00	4.00	4.00	1812
	10.00/11.00	2225	0	1812	67.46	Water Level >67.00 &Rising?; RESET GATES IN SEQUENCE to 6.00m	4.00	4.00	4.00	4.00	4.00	1812
	11.00/12.00	1778	0	2213	67.46		6.00	6.00	6.00	6.00	6.00	2213
	12.00/13.00	1472	0	2537	67.41		6.00	6.00	6.00	6.00	6.00	2537
	13.00/14.00	1139	0	2530	67.37		6.00	6.00	6.00	6.00	6.00	2530
	14.00/15.00	995	51	2521	67.32		6.00	6.00	6.00	6.00	6.00	2521
	15.00/16.00	1020	103	2512	67.27	Water Level >67.00 &Falling; RESET ONE GATE to 5.00m	6.00	6.00	6.00	6.00	6.00	2512
	16.00/17.00	1523	154	2440	67.24	Water Level >67.00 &Falling; RESET ONE GATE to 5.00m	6.00	6.00	6.00	5.00	6.00	2440
	17.00/18.00	1360	205	2367	67.21	Water Level >67.00 &Falling; RESET ONE GATE to 5.00m	6.00	5.00	6.00	5.00	6.00	2367
	18.00/19.00	958	255	2293	67.16	Water Level >67.00 &Falling; RESET ONE GATE to 5.00m	6.00	5.00	5.00	5.00	6.00	2293
Friday	19.00/20.00	1514	303	2220	67.14	Water Level >67.00 &Falling; RESET ONE GATE to 5.00m	6.00	5.00	5.00	5.00	5.00	2220
	20.00/21.00	1300	351	2149	67.11	Water Level >67.00 &Falling; RESET ONE GATE to 4.00m	5.00	5.00	5.00	5.00	5.00	2149
	21.00/22.00	1387	403	2072	67.09	Water Level >67.00 &Falling; RESET ONE GATE to 4.00m	5.00	5.00	5.00	4.00	5.00	2072
	22.00/23.00	1519	456	1996	67.07	Water Level >67.00 &Falling; RESET ONE GATE to 4.00m	5.00	4.00	5.00	4.00	5.00	1996
	23.00/24.00	818	509	1919	67.04	Water Level >67.00 &Falling; RESET ONE GATE to 4.00m	5.00	4.00	4.00	4.00	5.00	1919
8/01/2011	00.00/01.00	1841	561	1843	67.04	Water Level >67.00 &Falling; RESET ONE GATE to 4.00m	5.00	4.00	4.00	4.00	4.00	1843
	01.00/02.00	1624	614	1769	67.03	Water Level >67.00 &Falling; RESET ONE GATE to 3.00m	4.00	4.00	4.00	4.00	4.00	1769
	02.00/03.00	1246	662	1689	67.02	Water Level >67.00 &Falling; RESET ONE GATE to 3.00m	4.00	4.00	4.00	3.00	4.00	1689
Saturday	03.00/04.00	1622	719	1608	67.02	Water Level >67.00 &Falling; RESET ONE GATE to 3.00m	4.00	3.00	4.00	3.00	4.00	1608
	04.00/05.00	1135	773	1528	67.00	Water Level >67.00 &Falling; RESET ONE GATE to 3.00m	4.00	3.00	3.00	3.00	4.00	1528

	05.00/06.00	1867	825	1448	67.02	Water Level >67.00 & Falling;	RESET ONE GATE to 3.00m	4.00	3.00	3.00	3.00	3.00	1448
	06.00/07.00	2144	879	1370	67.04			3.00	3.00	3.00	3.00	3.00	1370
	07.00/08.00	1515	927	1367	67.05			3.00	3.00	3.00	3.00	3.00	1367
	08.00/09.00	1649	980	1368	67.06			3.00	3.00	3.00	3.00	3.00	1368
	09.00/10.00	1755	1031	1369	67.07			3.00	3.00	3.00	3.00	3.00	1369
	10.00/11.00	1399	1085	1369	67.07			3.00	3.00	3.00	3.00	3.00	1369
	11.00/12.00	1260	1138	1369	67.07			3.00	3.00	3.00	3.00	3.00	1369
	12.00/13.00	1530	1189	1369	67.07			3.00	3.00	3.00	3.00	3.00	1369
8/01/2011	13.00/14.00	1799	1239	1370	67.09	Steady as you go		3.00	3.00	3.00	3.00	3.00	1370
	14.00/15.00	1581	1240	1371	67.09			3.00	3.00	3.00	3.00	3.00	1371
	15.00/16.00	1418	1241	1371	67.09			3.00	3.00	3.00	3.00	3.00	1371
	16.00/17.00	1227	1242	1371	67.09			3.00	3.00	3.00	3.00	3.00	1371
	17.00/18.00	1255	1242	1371	67.09			3.00	3.00	3.00	3.00	3.00	1371
	18.00/19.00	1255	1242	1371	67.08			3.00	3.00	3.00	3.00	3.00	1371
	19.00/20.00	1255	1242	1370	67.08	Water Level >67.00 & Falling;	RESET ONE GATE to 2.00m	3.00	3.00	3.00	3.00	3.00	1370
Saturday	20.00/21.00	1282	1242	1289	67.08	Water Level >67.00 & Falling;	RESET ONE GATE to 2.00m	3.00	3.00	3.00	2.00	3.00	1289
	21.00/22.00	1091	1242	1203	67.07	Water Level >67.00 & Falling;	RESET ONE GATE to 2.00m	3.00	2.00	3.00	2.00	3.00	1203
	22.00/23.00	899	1242	1116	67.07	Water Level >67.00 & Falling;	RESET ONE GATE to 2.00m	3.00	2.00	2.00	2.00	3.00	1116
	23.00/24.00	926	1242	1030	67.06	Water Level >67.00 & Falling;	RESET ONE GATE to 2.00m	3.00	2.00	2.00	2.00	2.00	1030
9/01/2011	00.00/01.00	925	1240	944	67.06			2.00	2.00	2.00	2.00	2.00	944
	01.00/02.00	943	1286	940	67.06	Water Level >67.00 & Falling;	RESET ONE GATE to 1.50m	2.00	2.00	2.00	2.00	2.00	940
	02.00/03.00	1189	1285	897	67.07	Water Level >67.00 & Falling;	RESET ONE GATE to 1.50m	2.00	2.00	2.00	1.50	2.00	897
	03.00/04.00	970	1285	852	67.08	Water Level >67.00 & Falling?;	RESET ONE GATE to 1.50m	2.00	1.50	2.00	1.50	2.00	852
	04.00/05.00	802	1336	807	67.08	Water Level >67.00 & Falling?;	RESET ONE GATE to 1.50m	2.00	1.50	1.50	1.50	2.00	807
Sunday	05.00/06.00	1047	1335	763	67.09	Water Level >67.00 & Falling?;	RESET ONE GATE to 1.50m	2.00	1.50	1.50	1.50	1.50	763
	06.00/07.00	1046	1334	718	67.10			1.50	1.50	1.50	1.50	1.50	718
	07.00/08.00	773	1334	716	67.10			1.50	1.50	1.50	1.50	1.50	716
	08.00/09.00	1182	1333	716	67.11			1.50	1.50	1.50	1.50	1.50	716
	09.00/10.00	1536	1332	717	67.14			1.50	1.50	1.50	1.50	1.50	717
	10.00/11.00	1646	1332	718	67.17	Water Level >67.00 & Rising	RESET FIVE GATES to 2.50m	1.50	1.50	1.50	1.50	1.50	718
	11.00/12.00	2080	1384	965	67.21			2.50	2.50	2.50	2.50	2.50	965
	12.00/13.00	2054	1385	1168	67.24			2.50	2.50	2.50	2.50	2.50	1168
	13.00/14.00	3448	1386	1172	67.31	Water Level >67.00 & Rising	RESET FIVE GATES to 4.00m	2.50	2.50	2.50	2.50	2.50	1172
	14.00/15.00	4136	1388	1520	67.40			4.00	4.00	4.00	4.00	4.00	1520
	15.00/16.00	3946	1394	1809	67.47	Water Level >67.00 & Rising	RESET FIVE GATES to 6.00m	4.00	4.00	4.00	4.00	4.00	1809
	16.00/17.00	4733	1398	2222	67.55			6.00	6.00	6.00	6.00	6.00	2222
	17.00/18.00	5454	1404	2565	67.65	Water Level >67.00 & Rising	RESET FIVE GATES to 8.50m	6.00	6.00	6.00	6.00	6.00	2565
	18.00/19.00	5848	1411	2979	67.74			8.50	8.50	8.50	8.50	8.50	2979
	19.00/20.00	7338	1419	3332	67.88	Gates about 50% Open/Water Level still low		8.50	8.50	8.50	8.50	8.50	3332
	20.00/21.00	7659	1428	3370	68.02	Allow water level to rise		8.50	8.50	8.50	8.50	8.50	3370
Sunday	21.00/22.00	7646	1440	3406	68.14			8.50	8.50	8.50	8.50	8.50	3406
	22.00/23.00	7935	1450	3441	68.28			8.50	8.50	8.50	8.50	8.50	3441
	23.00/24.00	7936	1452	3477	68.42			8.50	8.50	8.50	8.50	8.50	3477
10/01/2011	00.00/01.00	8449	1473	3514	68.56			8.50	8.50	8.50	8.50	8.50	3514
	01.00/02.00	8732	1539	3553	68.72			8.50	8.50	8.50	8.50	8.50	3553
	02.00/03.00	9133	1605	3595	68.89			8.50	8.50	8.50	8.50	8.50	3595
	03.00/04.00	8759	1672	3635	69.04			8.50	8.50	8.50	8.50	8.50	3635
Monday	04.00/05.00	8933	1740	3673	69.20			8.50	8.50	8.50	8.50	8.50	3673
	05.00/06.00	9312	1806	3713	69.36			8.50	8.50	8.50	8.50	8.50	3713
	06.00/07.00	9351	1875	3753	69.53			8.50	8.50	8.50	8.50	8.50	3753

	07.00/08.00	10095	1944	3795	69.72			8.50	8.50	8.50	8.50	8.50	3795
	08.00/09.00	9731	2015	3838	69.89			8.50	8.50	8.50	8.50	8.50	3838
	09.00/10.00	7267	2031	3871	69.94			8.50	8.50	8.50	8.50	8.50	3871
	10.00/11.00	8059	2044	3895	70.10			8.50	8.50	8.50	8.50	8.50	3895
	11.00/12.00	9026	2053	3924	70.24			8.50	8.50	8.50	8.50	8.50	3924
	12.00/13.00	7384	2067	3951	70.34			8.50	8.50	8.50	8.50	8.50	3951
	13.00/14.00	7856	2077	3974	70.44		Rate of Discharge at Flood Levels	8.50	8.50	8.50	8.50	8.50	3974
	14.00/15.00	8411	2087	3999	70.56	Water Level still relatively low	LOWER ONE GATE to 8.00m	8.50	8.50	8.50	8.50	8.50	3999
Monday	15.00/16.00	6568	2155	3986	70.63			8.00	8.50	8.50	8.50	8.50	3986
	16.00/17.00	5116	2277	3996	70.66	Water Level still relatively low	LOWER SECOND GATE to 8.00m	8.00	8.50	8.50	8.50	8.50	3996
10/01/2011	17.00/18.00	5286	2399	3969	70.70			8.00	8.50	8.50	8.50	8.00	3969
	18.00/19.00	4946	2517	3974	70.73			8.00	8.50	8.50	8.50	8.00	3974
	19.00/20.00	4920	2695	3979	70.75			8.00	8.50	8.50	8.50	8.00	3979
	20.00/21.00	5026	2699	3985	70.78			8.00	8.50	8.50	8.50	8.00	3985
	21.00/22.00	4488	2705	3990	70.79			8.00	8.50	8.50	8.50	8.00	3990
	22.00/23.00	4574	2709	3993	70.81			8.00	8.50	8.50	8.50	8.00	3993
10/01/2011	23.00/24.00	4654	2713	3996	70.83	Water Level still relatively low	LOWER THIRD GATE to 8.00m	8.00	8.50	8.50	8.50	8.00	3996
11/01/2011	00.00/01.00	4175	2717	3964	70.83			8.00	8.50	8.00	8.50	8.00	3964
	01.00/02.00	3594	2721	3962	70.82			8.00	8.50	8.00	8.50	8.00	3962
	02.00/03.00	4388	2724	3962	70.83			8.00	8.50	8.00	8.50	8.00	3962
	03.00/04.00	4974	2726	3966	70.86			8.00	8.50	8.00	8.50	8.00	3966
Tuesday	04.00/05.00	5866	2731	3974	70.91			8.00	8.50	8.00	8.50	8.00	3974
	05.00/06.00	6817	2736	3987	70.99	Water Level still relatively low	LOWER FOURTH GATE to 8.00m	8.00	8.50	8.00	8.50	8.00	3987
	06.00/07.00	6802	2745	3971	71.07			8.00	8.00	8.00	8.50	8.00	3971
	07.00/08.00	8060	2753	3985	71.18	Water Level still relatively low	LOWER FIFTH GATE to 8.00m	8.00	8.00	8.00	8.50	8.00	3985
	08.00/09.00	9165	2991	3962	71.33	Rapid Water Level Rise	LOWER FIRST GATE TO 7.50 m	8.00	8.00	8.00	8.00	8.00	3962
	09.00/10.00	10376	3347	3965	71.50			7.50	8.00	8.00	8.00	8.00	3965
	10.00/11.00	9606	3533	3996	71.63	Rapid Water Level Rise	LOWER SECOND GATE TO 7.50 m	7.50	8.00	8.00	8.00	8.00	3996
	11.00/12.00	10120	3667	3988	71.83	Rapid Water Level Rise	LOWER THIRD GATE TO 7.50 m	7.50	8.00	8.00	8.00	7.50	3988
	12.00/13.00	11561	4250	3981	72.03	Rapid Water Level Rise	LOWER FOURTH GATE TO 7.50 m	7.50	8.00	7.50	8.00	7.50	3981
	13.00/14.00	9739	4562	3972	72.18	Rapid Water Level Rise	LOWER FIFTH GATE TO 7.50 m	7.50	7.50	7.50	8.00	7.50	3972
	14.00/15.00	9055	5167	3954	72.31			7.50	7.50	7.50	7.50	7.50	3954
	15.00/16.00	8947	5786	3974	72.44			7.50	7.50	7.50	7.50	7.50	3974
	16.00/17.00	8196	6432	3995	72.55	Less Rapid Water Level Rise	LOWER FIRST GATE TO 7.00 m	7.50	7.50	7.50	7.50	7.50	3995
	17.00/18.00	7141	6774	3969	72.63			7.00	7.50	7.50	7.50	7.50	3969
	18.00/19.00	6876	7464	3980	72.70			7.00	7.50	7.50	7.50	7.50	3980
Tuesday	19.00/20.00	7060	7464	3993	72.78	Less Rapid Water Level Rise	LOWER SECOND GATE TO 7.00 m	7.00	7.50	7.50	7.50	7.50	3993
	20.00/21.00	6797	7458	3962	72.86			7.00	7.50	7.50	7.50	7.00	3962
	21.00/22.00	6229	7111	3971	72.91	Water level Reaching alarming Levels		7.00	7.50	7.50	7.50	7.00	3971
	22.00/23.00	5964	7103	3980	72.97	Hopefully Peak inflow has Passed!! (See Frenetic Activity above)		7.00	7.50	7.50	7.50	7.00	3980
11/01/2011	23.00/24.00	5052	6118	3986	72.99	Stiill have Temporary Storage to El 75.70 (Lower Fuse Plug) and		7.00	7.50	7.50	7.50	7.00	3986
12/01/2011	00.00/01.00	4750	6109	3990	73.01	5 Gates to be opened to the maximum		7.00	7.50	7.50	7.50	7.00	3990
	01.00/02.00	4096	5492	3992	73.01			7.00	7.50	7.50	7.50	7.00	3992
	02.00/03.00	4638	5483	3994	73.03			7.00	7.50	7.50	7.50	7.00	3994
	03.00/04.00	4190	4888	3995	73.03			7.00	7.50	7.50	7.50	7.00	3995
Wednesday	04.00/05.00	4083	4304	3996	73.04	Joy oh Joy		7.00	7.50	7.50	7.50	7.00	3996
	05.00/06.00	3984	3727	3996	73.04	Joy oh Joy		7.00	7.50	7.50	7.50	7.00	3996
	06.00/07.00	3694	3143	3995	73.03			7.00	7.50	7.50	7.50	7.00	3995
	07.00/08.00	2473	2547	3992	72.99	Storage >160%		7.00	7.50	7.50	7.50	7.00	3992
	08.00/09.00	2510	2547	3986	72.95	Still High Inflow Levels		7.00	7.50	7.50	7.50	7.00	3986

	09.00/10.00	2804	2547	3980	72.92	Outflow Rate limited	7.00	7.50	7.50	7.50	7.00	3980
	10.00/11.00	2730	2547	3975	72.89	Vulnerable for some time	7.00	7.50	7.50	7.50	7.00	3975
	11.00/12.00	3025	2547	3971	72.87		7.00	7.50	7.50	7.50	7.00	3971
	12.00/13.00	3098	2547	3967	72.84		7.00	7.50	7.50	7.50	7.00	3967
	13.00/14.00	2145	2549	3961	72.80		7.00	7.50	7.50	7.50	7.00	3961
	14.00/15.00	2880	2549	3955	72.77	Maintain Maximum Release OPEN ADDITIONAL GATE TO 7.50 m	7.00	7.50	7.50	7.50	7.00	3955
	15.00/16.00	2511	2548	3993	72.73		7.00	7.50	7.50	7.50	7.50	3993
	16.00/17.00	2476	2550	3989	72.69		7.00	7.50	7.50	7.50	7.50	3989
	17.00/18.00	3136	2548	3983	72.67		7.00	7.50	7.50	7.50	7.50	3983
	18.00/19.00	2573	2550	3979	72.64		7.00	7.50	7.50	7.50	7.50	3979
	19.00/20.00	2329	2550	3972	72.59		7.00	7.50	7.50	7.50	7.50	3972
	20.00/21.00	2072	2550	3964	72.55		7.00	7.50	7.50	7.50	7.50	3964
Wednesday	21.00/22.00	2108	2549	3956	72.50	Maintain Maximum Release OPEN LAST GATE TO 7.50 m	7.00	7.50	7.50	7.50	7.50	3956
	22.00/23.00	2107	2548	3988	72.45		7.50	7.50	7.50	7.50	7.50	3988
	23.00/24.00	2143	2547	3985	72.40		7.50	7.50	7.50	7.50	7.50	3985
13/01/2011	00.00/01.00	1848	2547	3976	72.35		7.50	7.50	7.50	7.50	7.50	3976
	01.00/02.00	1887	2546	3966	72.29		7.50	7.50	7.50	7.50	7.50	3966
	02.00/03.00	1891	2544	3957	72.24	Maintain Maximum Release OPEN FIRST GATE TO 8.00 m	7.50	7.50	7.50	7.50	7.50	3957
	03.00/04.00	1890	2544	3988	72.19		8.00	7.50	7.50	7.50	7.50	3988
	04.00/05.00	1888	2542	3981	72.13		8.00	7.50	7.50	7.50	7.50	3981
	05.00/06.00	1887	2541	3971	72.08	Maintain Maximum Release OPEN SECOND GATE TO 8.00 m	8.00	7.50	7.50	7.50	7.50	3971
	06.00/07.00	1922	2540	4002	72.03		8.00	7.50	7.50	7.50	8.00	4002
	07.00/08.00	1631	2539	3993	71.96		8.00	7.50	7.50	7.50	8.00	3993
	08.00/09.00	1629	2537	3981	71.90		8.00	7.50	7.50	7.50	8.00	3981
	09.00/10.00	1918	2536	3970	71.84		8.00	7.50	7.50	7.50	8.00	3970
	10.00/11.00	1917	2534	3960	71.79	Maintain Maximum Release OPEN THIRD GATE TO 8.00 m	8.00	7.50	7.50	7.50	8.00	3960
	11.00/12.00	1589	2534	3988	71.72		8.00	7.50	8.00	7.50	8.00	3988
	12.00/13.00	1938	2592	3978	71.66		8.00	7.50	8.00	7.50	8.00	3978
	13.00/14.00	2539	2650	3969	71.62		8.00	7.50	8.00	7.50	8.00	3969
	14.00/15.00	1451	2650	3959	71.55	Maintain Maximum Release OPEN FOURTH GATE TO 8.00 m	8.00	7.50	8.00	7.50	8.00	3959
	15.00/16.00	1677	2769	3985	71.49		8.00	8.00	8.00	7.50	8.00	3985
	16.00/17.00	1817	2825	3975	71.43		8.00	8.00	8.00	7.50	8.00	3975
	17.00/18.00	1231	2883	3962	71.35	Maintain Maximum Release OPEN FIFTH GATE TO 8.00 m	8.00	8.00	8.00	7.50	8.00	3962
	18.00/19.00	2062	2997	3987	71.30		8.00	8.00	8.00	8.00	8.00	3987
	19.00/20.00	1530	3111	3977	71.23		8.00	8.00	8.00	8.00	8.00	3977
	20.00/21.00	1679	3225	3964	71.17		8.00	8.00	8.00	8.00	8.00	3964
	21.00/22.00	2091										
	22.00/23.00											
	23.00/24.00											

Cockup Gate lifted
one hour too early

14/01/2011 00.00/01.00
This spreadsheet is incomplete as at 9.00 3rd May 2011
The number crunching will proceed unabated
This is supplementary to my original submissions and hopefully
when complete, the ultimate

Ian Chalmers B.E.,B Econ.