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July 15, 2011

Ms. Terry Macaulay
Delta Stewardship Council
980 9th Street, Suite 1500
Sacramento, CA 95814

Subject: Historic Levee Improvements and the Need to Continue Delta Levees Subventions Program

Dear Ms. Macaulay:

As we have testified recently before the Delta Stewardship Council (Council), over the past 23 years, the Delta Levees Program, and more specifically, the Delta Levees Subventions Program, has greatly increased the level of protection provided by the Delta levees. We now request that the Council recognize the benefits of the Delta Levee Subventions Program by including its continuation in the Delta Plan.

Contrary to many recent reports, the Delta levees are much better than they were 30 years ago. To illustrate this point, attached are two excerpts from comprehensive reports evaluating the Delta's levees. Attachment 1 is from the DWR Bulletin 192-82 (1982). Attachment 2 is from the 2008 DWR Delta Risk Management Strategy (DRMS). Note that in 1982, many islands were predicted to flood over 10 times per 100 years, on the average. Bouldin Island alone was estimated to flood 18.25 times in 100 years. By contrast, the DRMS report estimated the probability of failure due to flood for most of the Central Delta islands at a 1-3% probability.

The reason for this great reduction in probability of failure is the Delta Levees Subventions Program. Prior to the Subventions Program, many of the Central Delta Levees had crown elevations of over 2-feet below the 100-year flood water surface elevation. As a result of the Subventions Program, almost all Central Delta levees improved their freeboard to 1-foot above the 100-year flood by the early 1990s. The resulting benefit has been the virtual elimination of failure due to overtopping. At the time Bulletin 192-82 was published, the most likely cause of levee failure was overtopping. The work performed under the first five years of the SB 34 (1988) Subventions Program was focused on increasing freeboard and crown width in order for reclamation districts to participate in FEMA's disaster assistance program. Without this increased freeboard, the high tides of 1995, 1997, 1998, and 2006 would have produced many levee failures.

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The current Delta Subventions Program, Water Code Section 12986, is due to sunset on July 1, 2013 and revert to a less effective program, which will considerably reduce the ability of Delta reclamation districts to reduce the risk to people, property, and State interests in the Delta, as desired in Chapter 7 of the Delta Plan. It is critical that the success of the current subventions program continue beyond 2013, particularly since there is bond money in Propositions 1E and 84 still to be allocated to fund the State's reimbursement of their cost share to the local agency once the maintenance of levee improvement work is complete.

Over the last 23-years, the Delta Levee Maintenance Program, CWC Section 12980 et seq., has not only increased the level of protection to the islands, but it has enabled the levees to be above the 100-year floodplain and qualify reclamation districts for FEMA disaster assistance. The recent work under the existing cost-share of the Delta Levees Subventions Program has positioned the levees to reach the next level of PL 84-99 criteria, at a manageable cost. Continuation of the current long-term maintenance program will also enable reclamation districts to keep up with sea level rise, protect the conveyance of water to 24 million Californians, and protect valuable habitat.

Therefore, we request the Council add an action item to the Delta Plan in Chapter 7, recommending the State Legislature approve legislation to eliminate the sunset date on the existing Delta Levees Program, since it has proven itself to be a successful and cost-effective program over the last 23 years.

Thank you for your consideration of this important matter.

Sincerely,
MBK ENGINEERS

Gilbert Cosio, Jr.

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Levee Failure Evaluation

As part of the joint Delta Levees Study, the Corps of Engineers evaluated the historical, present, and future frequency of levee failure. While construction of upstream reservoirs since the middle 1940s has reduced peak floodflows, and thereby the number of failures due to overtopping, failures due to levee instability have increased and will probably continue to increase due to subsidence of the island floors, which increases the hydrostatic pressure on the levees. The detailed procedures and results of analyses of frequency of failure due to overtopping and failure due to levee instability have been published by the Corps of Engineers as supporting material to its draft feasibility report on Delta levee rehabilitation. The statistical frequency of levee failure from a combination of overtopping and instability for islands and flood plains in the study area under both present and future conditions (without a levee improvement project) is summarized in Table 9. The estimated frequency of failure is generalized in four categories in Figure 12. Figure 13 shows frequency of failure 40 years in the future assuming no major rehabilitation program.

Levee conditions as presented in the Corps' study are based on levee data collected in 1974. While some levees have been improved since then, others may be in worse condition, but from a statistical point of view, the analysis provides an adequate basis for a feasibility study.

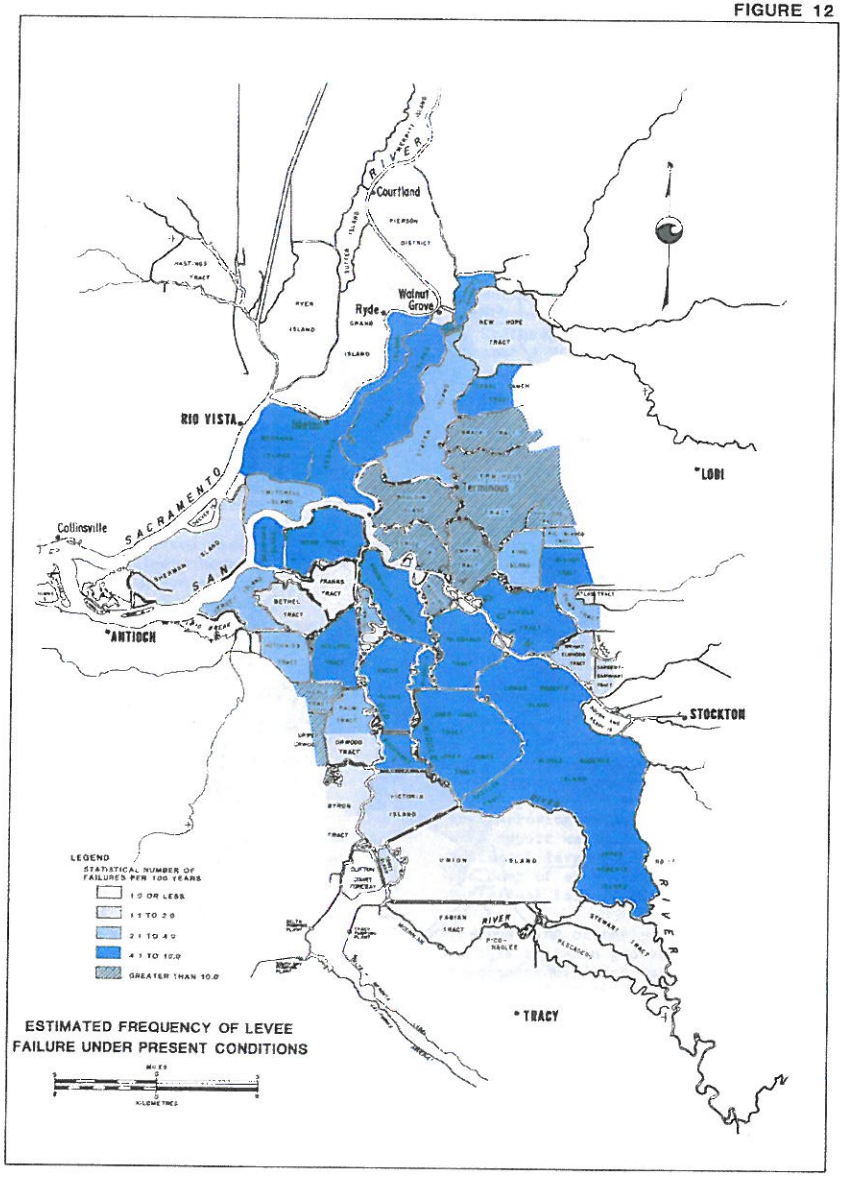
Table 9

STATISTICAL FREQUENCY OF LEVEE FAILURES PER 100 YEARS

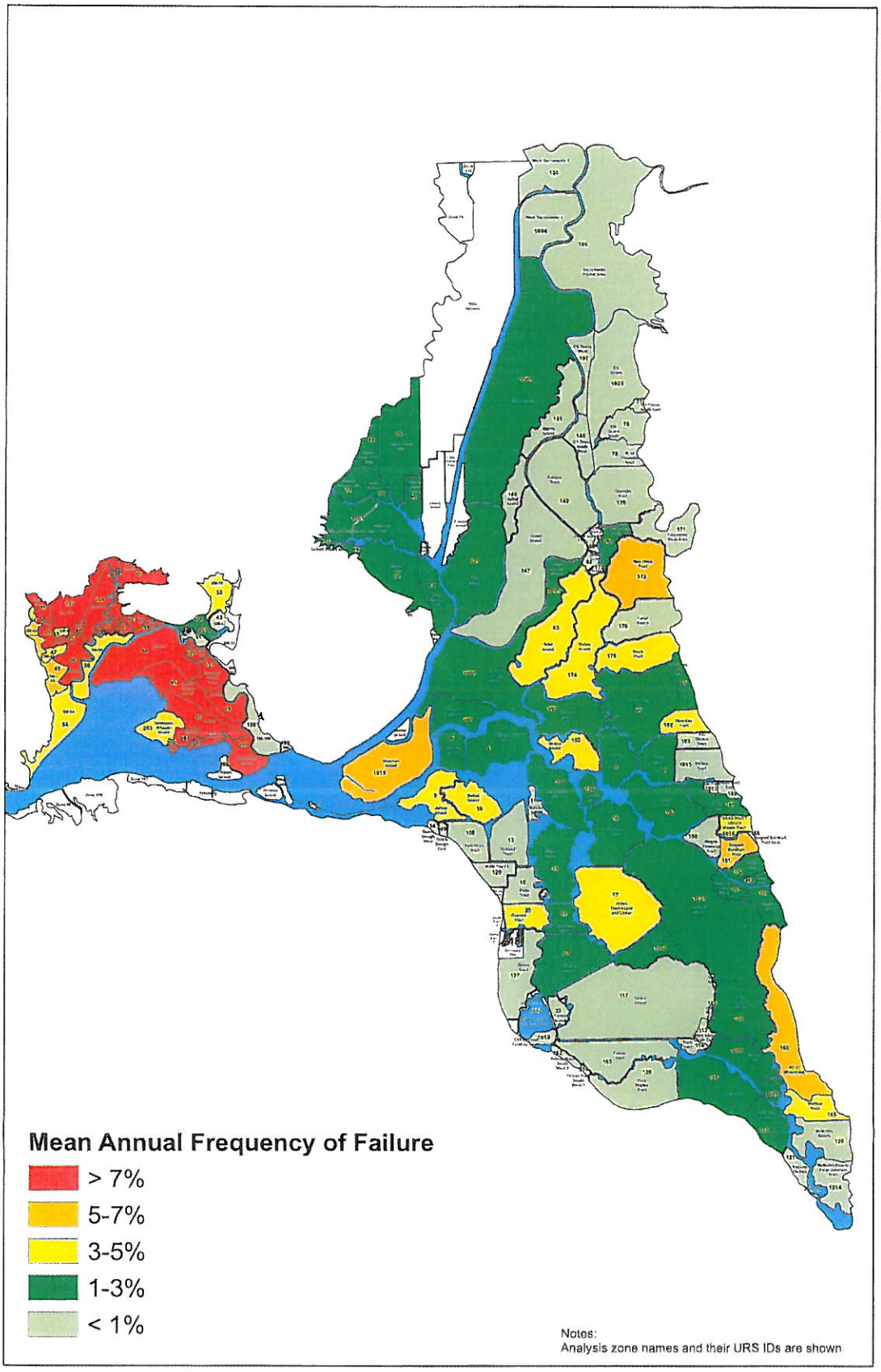
Island	Existing	After 20 Years	After 40 Years	After 60 Years	After 80 Years
Andrus-Brannan	4.64	6.81	6.99	7.01	7.01
Atlas	0.65	0.66	0.70	0.79	0.94
Bacon	5.63	7.25	8.77	10.09	11.19
Bethel	0.20	0.86	1.91	3.40	4.29
Bishop	5.67	6.04	6.23	6.26	6.29
Bouldin	18.25	18.25	18.25	18.25	18.25
Brack	13.00	13.25	13.44	13.48	13.51
Bradford	5.00	5.92	6.29	6.53	6.59
Byron	0.13	0.46	1.02	1.65	2.51
Canal Ranch	5.22	6.50	7.13	7.57	7.79
Coney	1.42	1.87	2.43	2.76	2.89
Dead Horse	5.08	5.12	5.28	5.44	5.63
Empire	12.22	14.08	14.85	15.32	15.63
Fabian	Neg.	Neg.	Neg.	0.01	0.20
Holland	4.17	5.68	7.89	9.12	9.82
Hotchkiss	2.80	3.77	4.46	5.26	5.59
Jersey	3.49	5.72	7.30	8.22	8.80
Jones, Roberts, Drexler	6.65	8.05	8.68	9.21	9.36
King	3.91	4.88	5.69	6.29	6.49
Mandeville	6.85	10.04	11.36	11.61	11.65
McCormack-Williamson	5.03	5.19	5.51	5.95	6.51
McDonald	7.65	9.82	11.04	11.53	11.82
Medford	16.90	17.03	17.07	17.07	17.07
Mildred	4.06	4.81	5.34	5.56	5.68
New Hope	1.82	2.41	3.44	4.72	5.45
Orwood	0.16	0.69	1.19	2.11	3.07
Orwood, Upper	11.78	12.19	12.54	12.84	13.13
Palm	3.87	4.27	4.46	4.50	4.56
Pescadero	0.94	1.40	1.80	2.13	2.46
Quimby	2.84	3.81	4.82	5.70	6.21
Rindge	7.14	9.56	11.47	12.44	13.01
Rio Blanco	3.52	3.69	4.01	4.39	4.71
Sargent-Barnhart	1.30	1.36	1.49	1.72	1.95
Sherman	1.54	5.33	7.16	7.26	7.26
Shima	2.21	3.71	4.99	5.38	5.70
Shin Kee	13.08	13.17	13.32	13.45	13.56
Staten	2.19	4.33	7.44	10.50	11.99
Stewart	0.94	1.40	1.80	2.13	2.46
Terminous	15.40	16.79	17.19	17.41	17.79
Twitchell	2.85	4.76	4.91	4.93	4.93
Tyler	5.17	5.94	6.37	6.79	6.91
Union	Neg.	0.02	0.09	0.30	0.73
Veale	12.09	13.40	13.71	13.87	13.91
Venice	16.43	17.03	17.03	17.03	17.03
Victoria	1.22	1.97	3.13	4.48	5.28
Walnut Grove	0.02	0.03	0.06	0.10	0.13
Webb	8.81	9.29	9.29	9.29	9.29
Woodward	6.86	7.62	7.93	8.16	8.34
Wright-Elmwood	1.31	2.14	2.93	3.36	3.58

From analysis by U. S. Army Corps of Engineers

FIGURE 12



Attachment 1



0 5 10 Miles

URS	DRMS	Mean Annual Frequency of Failure for Individual Islands Under Flooding Events	Figure 13-13a
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URS Corporation, Oakland CA, dhwright P:\GIS\GIS_Phase_III_Project_Files\MXD\Current Working Documents\Risk\Flooding\FINAL Flooding annual prob of failure 2008.mxd - 9/11/2008 @ 12:04:57 PM

Attachment 2