

April 27, 2012

Mr. Mark Cowin, P.E., Director
California Department of Water Resources
P.O. Box 942836, Room 1115-1
Sacramento, CA 94236-0001

**SUBJECT: FloodSAFE – A Framework for Department of Water Resources
(DWR) Investments in Delta Integrated Flood Management, Draft V3
DHF and SMB, February 14, 2011**

Dear Mr. Cowin:

The undersigned engineering firms have concerns related to the current information in the subject document, and public oral and written comments made by DWR to the current Delta Stewardship Council's Delta Plan process regarding DWR's endorsement of the FEMA Hazard Mitigation Plan minimum levee geometry as the baseline levee requirement. Based on our Delta engineering experience and the experience of 50 years of public Delta planning efforts, we respectfully request DWR to reconsider its position, or provide engineering justification for its position.

The undersigned firms have many years of Delta levee experience. Two of the firms have been involved with Delta levees over 50 years. The senior principal from each of the firms have over 100 years of combined Delta levee experience. Together, we currently represent approximately 80% of all the Delta reclamation and levee districts, and have past experience on almost all the others.

The HMP standard that DWR currently endorses is actually the "Short Term Mitigation Plan" as defined in "*State of California, FLOOD HAZARD MITIGATION PLAN, 180- Day Report Prepared in Accordance with Section 406 of Public Law 93-288, August 21, 1986*" (California OES & DWR). In that report, it includes a "Long Term Mitigation Plan" based on DWR Bulletin 192-82 (described, below) and the U. S. Army Corps of Engineers (Corps) companion document, "*Sacramento-San Joaquin Delta, California, Draft Feasibility Report and Draft Environmental Impact Statement, October 1982*". We feel DWR's decision disregards the findings of its own Bulletin 192-82, the Corps 1982 draft report, and the past thirty years of engineering analysis, design, and practical experience by DWR, the Corps, and local engineering consultants regarding levees in the Sacramento-San Joaquin Delta (Delta). The subject draft document adopts this Short Term HMP geometry as DWR's baseline requirement for future state investments in Delta levees – without realizing that the HMP geometry is inadequate for the

state's long-term investments as envisioned by the above reports, and has little engineering basis as a design standard.

Short Term Hazard Mitigation Plan: The Short Term HMP levee geometry was negotiated among FEMA, DWR, and the Delta reclamation districts following Delta disaster declarations resulting from the 1982-83 and 1986 floods. It was rationalized as an interim step with the objective of mitigating and rapidly improving Delta levees on islands (that were then in much worse shape than they are now) so they would be less likely to overtop, or be substantially damaged in the event of another federal disaster event. There was no pretention that the HMP geometry was an adequate long-term technical design standard. The HMP Criteria was solely for the purpose of meeting FEMA Public Assistance eligibility. Levees must protect against water flowing over the levee (overtopping) and water seeping through or below the levee. The HMP standard provides a measure of protection against water flowing over the levee but provides no safety requirements for seepage. The objective of the HMP criteria was to make some sort of improvement quickly. Even though the levees would still be vulnerable to failure, they would be less vulnerable to failure by overtopping. This interim, temporary goal is not an adequate technical design standard for DWR's current program that is investing hundreds of millions of dollars in Delta levee improvements. The HMP geometry has no basis for evaluating the safety and reliability of a given reach of levee is neither reliable nor a durable design standard.

Two levees in the delta could have reliabilities that greatly vary yet both meet the HMP criteria. Some delta levees are comprised of clay fill and founded on fine-grained foundation materials. Other levees in the delta are comprised of sand fill placed on a sand foundation. The second levee would be at much higher risk of a seepage induced failure yet both would meet the baseline level of protection. The levees do not provide the same level of protection implied in meeting the HMP standard.

The past thirty years of work have provided widely recognized engineering approaches to minimally acceptable design that are suitable for longer-term Delta levee investments:

DWR Bulletin 192-82: This DWR bulletin, issued in 1982, responded to a specific legislative request and, among other topics, provided details discussing design considerations developed in cooperation with the Corps. The design ideas presented would result in a levee substantially stronger than the HMP geometry – flatter water-side and land-side slopes, inclusion of land-side berms as necessary, use of once-in-300-year water levels, provision of more freeboard (1.5 feet minimum), and additional freeboard for wind-generated waves. The DWR approach is clearly oriented toward a levee design that is adequate to withstand the postulated design loading long term. In furtherance of this issue the state legislature in 1988 passed SB 34, The Delta Flood Protection Act of 1988 (Water Code Sections 12986 and 12300) which required that Delta Levee Subvention projects be compatible with Bulletin 192-82. Attached is a draft DWR memorandum report that further expands the discussion of an adequate levee standard.

Corps Delta-Specific PL 84-99: In 1987, the Corps issued this Delta-Specific guideline for non-project levees to qualify for post-flood rehabilitation assistance. In general, the stated criteria are very similar to those in Bulletin 192-82, except that the Corps used the once-in-100-

year water level, varied the land-side slope based on the depth of foundation peat, included a toe drain, and indicated an objective for a minimum static factor of safety of at least 1.25.

CALFED: Under the multi-agency CALFED Bay-Delta Accord (1995 to 2000), the integrity of Delta levees was addressed as a major program area. Part of the resulting Levee System Integrity Program was improvement of all Delta levees to a “base level of protection.” The final EIS/EIR stated this commitment as follows:

“The CALFED Levee Program will institute a program that is cost-shared among the beneficial users, to reconstruct Delta levees to the Corps’ PL 84-99 Delta Specific Standard” (CALFED Levee System Integrity Program Plan, Final EIS/EIR Technical Appendix, July 2000, page ES-2).

This commitment was then reflected in the Record of Decision (ROD) in August, 2000 and was to be implemented through a Memorandum of Understanding between the Corps and DWR executed in July, 2001.

Recent practice by Delta Reclamation District Engineers: As engineers for Delta reclamation districts, we have been applying for and securing State of California funding through the DWR Delta Levees Program, and have been proposing, designing, and implementing long-term improvements responsive to the CALFED ROD – using the Corps Delta-Specific PL 84-99 guideline with some enhancements responsive to the DWR Bulletin 192-82. The designs are based on site specific conditions at each levee reach and not blindly based on a simple geometric standard. We believe that the public expects their money to be spent using reasonable judgment and site specific knowledge. Our extensive field experience and the follow-on levee performance have provided us substantial confidence in the designs and the construction methods we have used. Recent costs have often been more favorable than pre-project estimates.

The subject draft document now being considered by DWR is a dramatic step backwards from the earlier CALFED/DWR/Corps commitment. DWR has provided no engineering analysis to establish that such a change is technically sensible or acceptable for long-term investments in the Delta levees.

Accordingly, if you choose to proceed with establishing the HMP geometry as DWR’s baseline levee design standard for Delta investment, we respectfully request that DWR provide the needed engineering justification. In the spirit of responsible engineering practice, DWR’s chief geotechnical engineer and chief civil engineer should approve DWR’s analysis and the adopted engineering design standard prior to the establishment of the HMP levee geometry as DWR’s baseline levee design standard for Delta investment strategy.

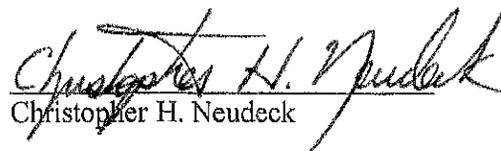
Over the past 30 years, we have seen a tremendous improvement in the state of Delta levees. Bulletin 192-82 estimated the cost to rehabilitate Delta levees at about \$1 billion. In 1999, we (KSN & MBK) estimated similar costs as part of our work for the CALFED program. Reviewing results of the 2007 DWR LiDAR survey, coupled with planned work utilizing allocated Proposition 1E funds, we estimate over 60% of all levees slated for rehabilitation to the

PL 84-99 standard will have reached that standard by 2014. Funding over the past 30 years (federal, state and local) through FEMA disaster assistance, and the Delta Levees Subventions and Special Projects Programs (including allocated, but not spent, Prop. 1E funds) is approaching \$700 million. In other words, we are getting close to reaching our goal. The strategy suggested by the subject document will add additional cost, delay rehabilitation, and could potentially strand millions of federal, state and local funds.

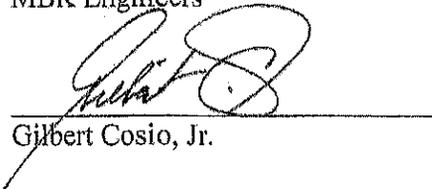
We stand ready to provide your engineering staff any background information or technical assistance that they would find to be helpful.

Sincerely,

Kjeldsen, Sinnock & Neudeck, Inc.


Christopher H. Neudeck

MBK Engineers


Gilbert Cosio, Jr.

Hultgren - Tillis Engineers


R. Kevin Tillis

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