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Thomas M. Zuckerman
P.O. Box 1804
Woodbridge, CA 95258-1804

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Phil Isenberg, Chair
Delta Stewardship Council
980 Ninth Street, Ste 1500
Sacramento, CA 95814

RE: Additional Comments on the Third Staff Draft Delta Plan (Chapters 5-7)

Dear Phil:

This letter continues to concentrate on ways to incorporate the "Big Affordable Ideas" covered in my March 30, 2011 letter to you. I started this process in my May 11, 2011 letter to you in the comments on Chapter 4 with respect to the Western Delta Conveyance and improving Regional Self-Reliance. The general theme of these letters continues to be the articulation of a plan that will address immediate problems within reasonable economic expectations while the science catches up with ultimate concerns about conveyance, regional water supply, ecosystem restoration and Central Valley flood management.

Dredging in the Delta

At the end of my May 11 letter to you, I indicated that I was deferring comments on the general subject of dredging in the Delta until responding to Chapter 7, notwithstanding the fact that the general subject of dredging cuts across the subject matter in Chapters 4, 5, 6, 7 and 8. With that in mind, I want to address the subject here in some detail, along with the Delta Corridors concept.

Summary. There is no one initiative before the Delta Stewardship Council which would have a greater positive impact upon flood management, through-Delta water conveyance and ecosystem restoration than untangling the regulatory log jam

Telephone: (209) 745-5537 *Fax: (209) 745-4792* *e-mail: tmz@talavera.us*

that has virtually stopped maintenance dredging in the channels of the Delta. The period in which maintenance dredging has come to a virtual standstill has witnessed catastrophic declines in most Delta fisheries and rapidly escalating costs of flood protection throughout the Delta, while exacerbating through-Delta water conveyance. Quickly implementable progress can be accomplished at relatively modest cost.

Brief History. Reclamation of Delta levees for agriculture was initiated by the Arkansas Act granting swamp and overflow lands to the State of California. Reclamation of the Delta periphery began in the 1860's with wheat and vegetable farming to feed the growing population initiated by the Gold Rush.

Because of the existing techniques and mechanical devices utilized, successful reclamation of the central and western portions of the Delta did not occur until later. The development of the diesel powered long boom dredges utilizing the clamshell bucket enabled the building of competent levees beginning about 1890. The clamshell bucket could dig the "slickens" from mid channel location and deposit them in the levee location to sufficient distance such that the excavated areas did not undermine the levees being constructed.

By at least 1922, virtually all of the existing levees in the Delta had been completed in essentially their current locations. A fleet of clamshell dredgers with boom lengths of 100 feet or more plied their trade in the Delta. Reclamation districts were formed to market bonds to finance the levee construction on behalf of the swamp and overflow land patent holders within the boundaries of the levees created. Those same reclamation districts continue to exist today, enabling the various landowners within the district to cooperate in the maintenance of the levees which protect their lands.

In the late 1940's the U.S. Bureau of Reclamation began construction of the Central Valley Project which intercepted flows from the San Joaquin River at Friant Dam, distributing them north and south to farmers on the east side of the San Joaquin Valley and into the Tulare Lake Basin to supplement other local

supplies of water, including ground water extraction which was creating an overdraft in the local aquifers. Shasta Dam was constructed on the Sacramento River to "regulate" flows of that river system to provide salinity control to the Delta and replacement water by way of an exchange for the lands previously served by the now diverted flows on the San Joaquin River. The Delta Cross Channel was then constructed to divert water from the Sacramento River into the two forks of the Mokelumne River and thence to Middle and Old Rivers to be pumped at Tracy into the Delta-Mendota Canal for distribution to exchange contractors. The nominal capacity of the Delta Cross Channel was the same as the capacity of the Tracy Pumping Plant.

All during this period the fisheries of the Delta, both resident and anadromous, remained in good condition. Maintenance dredging by the local reclamation districts maintained channel capacities and viable levees throughout the Delta, including the conveyance path of water from the Delta Cross Channel to the Tracy pumps.

In the late 1960's and early 1970's, the State of California undertook the construction of the State Water Project, approved by the voters in 1959. This involved the construction of Oroville Dam on the Feather River, the California Aqueduct and San Luis Dam. The San Luis Project was added to the Bureau of Reclamation's operations in reliance upon shared capacity at San Luis Reservoir. Significantly, neither improved Delta conveyance nor additional upstream storage was accomplished beyond the construction of Oroville Dam with a nominal dry period yield of less than 1M acre feet per year. Notwithstanding, the State Water Project signed contracts with customers to deliver 4.2M acre feet of water annually from the Delta and the Bureau of Reclamation contracted to supply over 1M acre feet of water into the San Luis service area.

Coincidentally, with the build up of demand for water from the State Water Project and the San Luis Project, regulation of maintenance dredging in the Delta became at first difficult and eventually overwhelming. For many years dredging in the Delta was covered by general permits issued by the U.S. Corps of Engineers after

consultation with federal and state agencies. The general permits which allowed maintenance dredging to occur in the Delta under tight, but not oppressive, conditions expired in 1991. Efforts spearheaded by the Delta Levee & Habitat Committee appointed by the California Secretary of Resources failed to achieve a renewal or its equivalent of the Corps' general permits. Ultimately, the objections interposed by the Central Valley Regional Water Quality Control Board required individual permitting on each proposed maintenance dredging project, an obstacle which individual reclamation districts could not overcome. The State government ceased its efforts to resurrect general dredging permits. Since then the only significant dredging projects which have been taken place in the Delta have been by the Corps of Engineers for the maintenance of the deep water project serving the Ports of Stockton and Sacramento.

As a consequence, levee maintenance has become exponentially more expensive. Dredger spoils which had been available previously at prices of roughly $3/cubic yard now generally are replaced by imported fill material that costs upwards of $20/cubic yard.

Channel capacities were no longer maintained by maintenance dredging. Channel depths were rapidly compromised by siltation, having the dual consequence of restricting water conveyance through the Delta channels by the export water projects and aggravating flood problems through decreased channel capacities and increased river stages as storm waters were emptied into the Delta from its tributaries. The dredger fleet in the Delta shrunk from eight to just one active dredger, further aggravating emergency response flood fighting and repair capability.

The increased Delta exports which built up through this same period of the 80's and 90's were accomplished by reverse flows from the western Delta resulting from insufficient north to south channel capacities in the interior of the Delta, drawing water and its aquatic inhabitants upstream from Suisun Bay. The same period witnessed decrease in fishery populations in the Delta, large portions of which "were recovered" at the export pumps, eventually leading to regulation of

export operations through court proceedings under the federal and state Endangered Species Act. The dramatic fishery declines occurred during the period after maintenance dredging virtually ceased.

Delta Corridors Project.

The Delta Corridors Project would build off the resumption of maintenance dredging in the Delta by isolating the flows in Old River from the exports in the South Delta, thereby providing a pathway for downstream flows from the San Joaquin River past the export pumps of the Central Valley Project and the State Water Project. Preserving net downstream flow in Old River provides not only a fish pathway for San Joaquin River anadromous fish but also a means of moving San Joaquin River drainage through the Delta, thereby avoiding constant recirculation of salts through the San Joaquin Valley and salt build up in the South Delta area. Continuing through Delta conveyance of Sacramento and Mokelumne River system inflows provides improved water quality for both agricultural and environmental usage throughout the South and Central Delta. Isolation of the Old River flows protects water quality exported from the South Delta.

Chapter 5: Restore The Delta Ecosystem

The discussion in Chapter 5 tends to consolidate all the physical changes that have occurred in the last 150 years, yet most of the observed impacts on the resident and anadromous aquatic organisms have occurred during the late eighties and nineties. One credible explanation involves the changes in Delta through-flow caused by the incremental export operations of the State Water Project upon conditions in Suisun Bay, the principal nursery area for many of the Bay-Delta aquatic organisms and fishes. The generally saltier, and less seasonally fluctuating water quality conditions, moved the null (mixing) zone of the estuary upstream into channel configurations less hospitable to primary food production and sustenance of dependent fisheries which had been relatively successful previously, not

withstanding the reclamation of the Delta peat lands into discreet islands which was essentially complete by at least 1922. The broad, flat and shallow Suisun Bay may have become inhospitable for the resident and anadromous fishes, especially if the more static, saline conditions presented a favorable niche for the invasive filter feeding clams which now dominate the area, removing most of the nutrients from the system. Encouraging irrigation of the Suisun Marsh from Montezuma Slough through operation of the Montezuma Slough Control Structure caused blockage of dendridic tidal sloughs from Suisun Bay, which undoubtedly further negatively impacted Suisun Bay's function as a nursery area for important aquatic species.

The foregoing scenario needs to be recognized in Chapter 5 (as well as in Chapters 4 and 6) to support the discussion about creating a more natural flow regime through the Delta. The discussion in Chapter 6 at p. 79, ll. 28-38, gets at this problem but it needs to be included in Chapter 5 to complete the discussion there.

Chapter 6: Improve Water Quality to Protect Human Health and the Environment.

In the introduction, tributary drainage should be added to the listing in ll. 9-10on p.77. At ll. 12-14, municipal and industrial discharges should be added to "agricultural drainage." The "sources of impairment" at ll. 25-26 should likewise include tributary agricultural, municipal and industrial drainage.

Mention should also be made of the original intent of the Bureau of Reclamation to construct a Master Drain in the San Joaquin Valley to alleviate such problems. In spite of the collection of funds from the sale of water delivered by the Central Valley Project to its contractors, such a drain was never completed, leading to the Kesterson selenium issues and, eventually, to the need to purchase and retire many thousands of acres of salt impaired lands in the CVP service area. Meanwhile, the San Joaquin River continues to serve as a drain for pollutants generated by the agricultural and urban development of the San Joaquin Valley, which are continuously recirculated by the export pumps in the South Delta. As noted previously, the Delta Corridors Project could remedy this problem.

Chapter 7: Reduce Risk to People, Property and State Interests in the Delta.

I have addressed the subject of Delta Agency for Flood Management Activities (p. 94, line 30, to p. 95, line 19) in a separate letter dated Monday, May 30, 2011, to Joe Grindstaff for reasons stated in that letter.

Delta Levee Design Criteria: Table 7-1 (pg. 91, lines 10, et seq.)

The concept of levee classifications based upon a degree of risk commensurate with the resources protected has great merit as long as abandonment after flooding does not become a part of the policy. Accepting a greater degree of risk of levee failure of an island containing fewer resources is appropriate given the lesser consequences of failure and likely lower cost of post-flood reclamation. Abandonment is inappropriate because ultimately failure to restore a failed levee will lead to weakening of adjacent levees protecting greater resources and much higher cost of maintaining those levees.

Having said that, the Minimum Design Criteria for agricultural land use should be Class 3-PL84-99, not Class 2-HMP. HMP criteria was developed after the flood emergencies in the early 1980's as the minimum level of maintenance justifying FEMA assistance in a flood fight/reclamation effort. It was never intended to be, and shouldn't be considered as, a minimum design criteria for adequate flood protection for agricultural land uses in the Delta.

Yours very truly,

THOMAS M. ZUCKERMAN

TMZ:csf
cc: Joe Grindstaff, DSC