

# Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay Delta Estuary

## Combined Short Public Comments

The individual comments included in this file are listed below in the order they appear. The document number can also be used to get these comments at [www.regulations.gov](http://www.regulations.gov).

| <b>Document Number</b>   | <b>Commenter</b>                           |
|--------------------------|--|
| EPA-R09-OW-2010-0976-003 | Crisi Matthews, Crisi Matthews Real Estate |
| EPA-R09-OW-2010-0976-004 | Chad Matthews, Valley Permit Services      |
| EPA-R09-OW-2010-0976-005 | Gene Beley                                 |
| EPA-R09-OW-2010-0976-006 | anonymous                                  |
| EPA-R09-OW-2010-0976-007 | Jerry Nielsen, Discovery Bay Yacht Club    |
| EPA-R09-OW-2010-0976-008 | Jamie Carey                                |
| EPA-R09-OW-2010-0976-009 | Marcus Balanky                             |
| EPA-R09-OW-2010-0976-010 | Edward Kolodziej, University of Nevada     |
| EPA-R09-OW-2010-0976-011 | David Brown                                |
| EPA-R09-OW-2010-0976-012 | Larry Ladd                                 |
| EPA-R09-OW-2010-0976-013 | David Hickson, Seafood Suppliers Inc.      |
| EPA-R09-OW-2010-0976-014 | Terry Spragg                               |
| EPA-R09-OW-2010-0976-015 | Douglas Stocks                             |
| EPA-R09-OW-2010-0976-016 | David Ford                                 |
| EPA-R09-OW-2010-0976-017 | Jon Hammari                                |
| EPA-R09-OW-2010-0976-018 | anonymous, Rutgers Law                     |
| EPA-R09-OW-2010-0976-019 | anonymous, Student                         |
| EPA-R09-OW-2010-0976-026 | Pat Borison                                |
| EPA-R09-OW-2010-0976-028 | Irwin Haydock                              |
| EPA-R09-OW-2010-0976-048 | anonymous                                  |
| EPA-R09-OW-2010-0976-055 | Thomas Cordano                             |
| EPA-R09-OW-2010-0976-056 | Robert Stanley                             |
| EPA-R09-OW-2010-0976-059 | Jim Bell                                   |

# PUBLIC SUBMISSION

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|-------------------------------------|
| <b>As of:</b> April 27, 2011        |
| <b>Received:</b> March 10, 2011     |
| <b>Status:</b> Posted               |
| <b>Posted:</b> April 04, 2011       |
| <b>Tracking No.</b> 80c0599d        |
| <b>Comments Due:</b> April 25, 2011 |
| <b>Submission Type:</b> Web         |

**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0003

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Crisi Matthews, Broker-Owner

**Organization:** Crisi Matthews Real Estate

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## General Comment

It is essential that the Delta continue to receive fresh waters and that they not be diverted or drained. The Delta is made up of a delicate eco-system that is grossly taxed by freshwater diversion and sales of water to other consumers. Gates, canals and other impacting proposals must be privately studied, evaluated and due-course must be followed prior to execution for utmost preservation and understanding of long term effects of short termed decisions.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** March 10, 2011  
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**Tracking No.** 80c0599e  
**Comments Due:** April 25, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0004

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Chad Matthews

**Organization:** Valley Permit Services

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## General Comment

Ideally, a thorough study of all proposals and their impact is crucial to decisions being made that will affect the delicate environment within and surrounding the Delta. If growth of homes being built is limited to protect the ridgeline of bay area communities to protect the view, then equal or greater care should be taken to determine the impact of diverting water, changing salinity and consumption to the ecosystem as a whole. This affects fish migrations, population and growth of healthy aquatic life. If we impose limits to protect the 'view' of our community why aren't we protecting the life within equally?

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0005

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Gene Beley, Stockton, CA

**Organization:** --Retired newspaper editor-publisher

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## General Comment

Government needs to QUIT sucking water out of the California Delta to export it to Southern California. It is ruining the water quality of the Delta and completely changing it for the worse. Like most journalists know, it's a case of following Big Money interests like Stuart Resnick, Kern County land owner and resident of Beverly Hills, who sold just some of his water rights for \$77 million a year! Delta farmers and residents are excluded for the most part from even having proper representation of the water in their back yard; this is totally wrong. Los Angeles, San Diego and Southern California need to focus on getting water out of the ocean, versus the Sacramento River. The folly of bulding a Panama size canal, above ground or undergrounding it, will become the greatest joke of the land, and financial disaster. California is already so broke that they may never recover to being a leader again, yet the state leaders are wasting thousands of hours on this new Water War on a canal that was already voted down by the people many years ago. Very sad to see politics working this way when there are much greater priorities and problems to solve.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0006

Comment on FR Doc # 2011-03861

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## Submitter Information

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## General Comment

The California Delta is the States Canary. If it dies from the intrusiojn of Saltwater so will the majority of the Farming, not to mention the fishing and tourism of the region. The latest Salmon is a perfect example. For the amount of money and politics WASTED so far and to continue, We could have some of the worlds BEST Salinity plants supplying endless water for more than California. Wake up and smell the roses.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** March 13, 2011  
**Status:** Posted  
**Posted:** April 04, 2011  
**Tracking No.** 80c06ef4  
**Comments Due:** April 25, 2011  
**Submission Type:** Web

**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0007

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Jerry Nielsen

**Organization:** Discovery Bay Yacht Club

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## General Comment

Being a 33 year resident of the SAC River Delta I have watched the gradual deterioration occur as more and more water is shipped south. Loss of fishery, weed buildup, invasive species (mitten crab, etc). Bypassing the Delta and removing more fresh water will only turn the South Delta into a cesspool. What sense does it make to turn the best AG land in the Country into a salt marsh, only to irrigate desert land to grow cotton and alfalfa, very water intensive crops. What happens to the San Francisco Estuary when all that fresh flushing water heads South. This is the biggest water grab since the draining of the Owens Valley on the East side of the Sierra. We just have to follow the money. I hope common sense prevails on this issue.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** March 15, 2011  
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**Posted:** April 04, 2011  
**Tracking No.** 80c08217  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0008

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Jamie Carey

**Organization:** none

**Government Agency Type:** Local

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## General Comment

The CA delta is one of the greatest national assets we have. We need to pull less water from it. If everyone did their part, it would be an easy solution. In some years, when we have excess rain, we should have a system and place to store the excess rain. In dry years, we need to pull less water from the delta. All groups should use less water and it can be done. A canal will ruin the delta, one of our greatest assets. Pumping too much water will ruin the delta.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** March 16, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0009

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Marcus Balanky

**Organization:** Private Citizen

**Government Agency Type:** Regional

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## General Comment

The real problem with the delta is multiple parts:

- A) Large (40') boats making huge wakes which damage levees
- B) Farmers dumping pesticides and fertilizers in the water. this kills off the baitfish, which therefore impacts are life in and around the water. Bass and birds.
- C) pumping water to LA
- D) why are there rice fields in a barren desert?

Basically there is way-to-much pumping at the south end for agriculture and LA-LA Land in the south. Cotton and rice fields in a desert valley seems like a waste of water to me. The south Delta is a big mud flat at times when those pumps are running. Another complaint was for better enforcement in the Delta. Not just more fishing license checks but there needs to be enforcement against boating stupidity. I've had many close calls there and seen some really nasty accidents, almost all with skiers and PWCs. Yes, I used to ski/barefoot and I used to have a stand-up Jet Ski but we never took the chances some of those boneheads take out there. I don't know the regs regarding wake sizes in the sloughs but I know that when wakes come up 2,1/2' over the transom of my boat that there is some law being broken about dangerous boating. Do people really need a 40' cruiser to wallow up and down the sloughs? We've already had enough levy collapses (yeah, I know, more fishing water) but if our tax money is going to repair and maintain the levies, those cruisers can slow waaaaaay down.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** February 10, 2011  
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**Comments Due:** April 25, 2011  
**Submission Type:** E-Mail

**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0010

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Dr. Edward P. Kolodziej

**Organization:** University of Nevada Reno

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## General Comment

See attached file

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## Attachments

**EPA-R09-OW-2010-0976-0010.1:** Comment on FR Doc # 2011-03861

**From:** Edward Kolodziej <koloj@unr.edu>

**To:** Erin Foresman/R9/USEPA/US@EPA

**Date:** Thursday, February 10, 2011 09:36AM

**Subject:** Sacramento-San Joaquin Delta Study

History:       ★ This message has been replied to.

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Hello Erin,

I saw the Sacbee article on this today, and thought I would send you an email. I've actually done lots of water quality work in the Central Valley and Delta region (see attached papers), especially with regard to endocrine disruptors and animal agriculture impacts, over the last decade or so. Some of that work was done when I was a grad student and post-doc at UC Berkeley, and I am continuing some of it now at Nevada. This work has been funded by the USDA, CALFED, and EPA STAR programs, so its not anything that has been paid for by interested parties. If you need any help with this, please let me know. I'd be interested in participating in any way I can. I have spent a good solid portion of my research career collecting samples out on the Central Valley and analyzing them.

Thanks,  
Ed

Edward P. Kolodziej  
Assistant Professor  
349B SEM, Mail Stop 258  
Department of Civil and Environmental Engineering  
University of Nevada, Reno  
Reno, NV 89557  
(775) 682-5553

**Attachments:**

Kolodziej 2004 EST.pdf

Kolodziej 2007 EST.pdf

Lavado EST 2009.pdf

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0011

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** David Brown

**Organization:** Sacramento-Yolo Mosquito & Vector Control District

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## General Comment

See attached file

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## Attachments

**EPA-R09-OW-2010-0976-0011.1:** Comment on FR Doc # 2011-03861

**From:** "Dave Brown" <dabrown@sac-yolomvcd.com>  
**To:** Erin Foresman/R9/USEPA/US@EPA

**Date:** Thursday, February 10, 2011 08:40AM

**Subject:** BMP's

History:      ✦ This message has been replied to.

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The state of California has had the opportunity to implement Best Management Practices relative to mosquito control....and yet has failed to do so. While we do not believe mosquito control pesticides are the issue, we are certainly leaders in doing what we can to ensure they are not. Yet legislation by Assembly member Yamada did not make it out of committee last year. Can you help with this?

David Brown  
8631 Bond Road  
Elk Grove Ca 95624  
(916) 685-1022 x2059

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0012

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Larry Ladd

**Organization:** Private Citizen

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## General Comment

See attached file

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## Attachments

**EPA-R09-OW-2010-0976-0012.1:** Comment on FR Doc # 2011-03861

**From:** lladd@sprintmail.com  
**To:** Erin Foresman/R9/USEPA/US@EPA  
**Date:** Thursday, February 10, 2011 09:51AM  
**Subject:** Delta cleanup needs a total nitrosamine assay?

History: ✨ This message has been replied to and forwarded.

---

Hi Ms. Foresman,

Given the nitrosodimethylamine detections in the finished water of the Contra Costa canal in Pittsburg CA, and the talk about regulating nitrosamines as a group, I thought the application of a total nitrosamine assay (TONO) along the lines of the attached study might help ferret out unmonitored problems, particularly in wastewater discharges.

Thanks,

Larry Ladd

Attachments:

TONO.pdf

# PUBLIC SUBMISSION

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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0013

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Dave Hickson

**Organization:** Seafood Suppliers Inc.

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## General Comment

See attached file

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## Attachments

**EPA-R09-OW-2010-0976-0013.1:** Comment on FR Doc # 2011-03861

**From:** Dave <dave@seafoodsuppliersinc.com>  
**To:** Erin Foresman/R9/USEPA/US@EPA  
**Date:** Thursday, February 10, 2011 12:19PM  
**Subject:** Delta Water (so many!) issues...

History:       ✦ This message has been replied to.

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Hello,

As an avid angler, I'm a lover of the Sacramento- San Joaquin Delta. I realize there are a great many possible causes for the declines in delta fish and wildlife, and am as mystified as anyone at the recent collapse which seems to exceed water/ drought related impacts. Likely its a combination of factors--perhaps a sort of tipping point was reached.

I thought I would toss in two factors I've observed that are discussed very little, but seem to be locally very important.

First, is weed eradication. Large areas of the delta are being treated for invasive weeds (Egeria, Hyacinth etc.). My fear is that while the herbicides may be relatively safe, the spraying may be causing large dead zones as the plant material decays and depletes oxygen levels. During the drought years very large areas were treated- and what had been very productive fishing areas seemed to be devoid of life after treatment. Not just weeds but everything seemed dead-- I suspect lack of oxygen.

The second is 'thermal' pollution. If you spend a great deal of time on the rivers flowing into the delta, you can't help but notice how trout, salmon and steelhead populations go up and down with the good and bad water years. This is obvious. Less obvious is that upstream water managers seem to reduce flows in ways that may have impacts far beyond what you might expect. I frequently follow the releases from upstream reservoirs and am regularly shocked to see flows cut drastically, and for a short duration, at what seem to very inappropriate times (say from 120 cfs to 36 cfs on during a period of near hundred degree weather). The result is often very deadly conditions for a short period of time. I think wiser timing of reservoir flows could help the delta immensely.

Just my two cents...

Thanks!

Dave Hickson

--

David Hickson  
**Seafood Suppliers Inc.**  
Pier 33 Suite 14  
San Francisco, CA 94111  
415-834-0256

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0014

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Terry Spragg

**Organization:** Spragg and Associates

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## General Comment

See attached file

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## Attachments

**EPA-R09-OW-2010-0976-0014.1:** Comment on FR Doc # 2011-03861

**EPA-R09-OW-2010-0976-0014.2:** Comment support document 1

**EPA-R09-OW-2010-0976-0014.3:** Comment support document 2

**EPA-R09-OW-2010-0976-0014.4:** Comment support document 3

**EPA-R09-OW-2010-0976-0014.5:** Comment support document 4

**From:** "Terry Spragg" <spraggbag@gmail.com>  
**To:** Erin Foresman/R9/USEPA/US@EPA  
**Date:** Thursday, February 10, 2011 09:05PM  
**Subject:** Sacramento Delta EPA issues  
**History:** ✦ This message has been replied to.

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Dear Erin,

I would like to ask the EPA to contact Professor Ray Seed (U.C. Berkeley levee expert and member of the Governor's Delta Vision Blue Ribbon Task Force---Ray was selected by the Federal government to oversee the U.S. Corps of Engineers levee repair efforts following the Katrina disaster---see attached news story) regarding his attached comments on the emergency fabric pipeline technology we have developed.

I would like to ask the EPA to review this information and to then contact me at: (562) 461-9195, or by email at the above address to discuss our plans to demonstrate this technology in the Delta.

Our fabric pipeline technology was developed as a result of our work on developing waterbag technology. You may view a YouTube video of some of the television news coverage we received when we demonstrated our waterbag technology in Washington State at:

<http://www.youtube.com/watch?v=4TEJp6UZaDI>. A story appears on our technology in Wikipedia at:  
[http://www.en.wikipedia.org/wiki/Spragg\\_Bag](http://www.en.wikipedia.org/wiki/Spragg_Bag).

I hope you will contact me to let me know that you have reviewed this letter.

All the best,

**Terry Spragg**

**Attachments:**

|   |   |   |   |
|---|---|---|---|
| Ray Seed Joe<br>Grindstaff Delta fabric<br>pipeline email.pdf | Ray Seed Emergency<br>Response Ideas to<br>DSC Sept 16 2010.pdf | Ray Seed and Bob<br>Bea Katrina report<br>credentials.pdf | Bob Bea waterbag<br>levee design letter.pdf |
|---|---|---|---|

**Charlene Jensen**

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**From:** RMSeed6@aol.com  
**Sent:** Monday, October 04, 2010 1:52 PM  
**To:** joe.grindstaff@deltacouncil.ca.gov  
**Cc:** phil.isenberg@deltacouncil.ca.gov; terry.macaulay@deltacouncil.ca.gov;  
eric.nichol@deltacouncil.ca.gov; elaine.martin@deltacouncil.ca.gov; Charlene Jensen  
**Subject:** Spragg Water Conduit

Dear Joe,

We did not have time to explicitly discuss Mr. Spragg's "waterbag" technology, and so I was planning to get back to you guys this week after you have cleared through the last Council Meeting and its aftermath.

So the timing is good here.

Mr. Spragg originally proposed his waterbag technology as a potential emergency measure for transporting fresh water across a seismically damaged Delta a number of years ago. My assessment was that although it was a novel and interesting idea, it would not be very useful at the full State level as the volume of water that could be delivered via towed waterbags was too small, and as it would face likely difficulties with regard to constrictions, obstacles and potential puncture threats during transit across a badly damaged Delta.

I was struck, however, by the greater potential represented by using the same type of fabric technology to construct a modular fabric "pipeline" through the Delta. As noted in the attached E-mail from Tawnley Pranger (Chief, Response and Security Section, Division of Flood Management, DWR) there is some significant potential promise here.

DWR has been largely discouraged/disallowed from considering novel ideas that might represent either back-up plans or interim options until we achieve a seismically secure "permanent" facility as the current Administration had decided instead to bank everything on a more narrowly focussed effort to garner permission (and eventually permits) to construct such a facility. Interim plans, and emergency back-up plans, were correctly viewed as having the potential to confuse and complicate that process. In that context, Mr. Pranger's response that the idea may have merit and that it might warrant study was admirably brave and frank. It is arguably disappointing that you and the Council had not been informed of this response. And perhaps others like it.

My view is that such a singular focus on the current effort to push through a secure transmission facility was an inadvisably risky approach, given (1) the unacceptably high current stakes, (2) the unacceptable likelihood that a seismic disaster will occur before such a secure transmission facility can be put in place (which will take at least ten years, even if we begin right away.... and with a roughly 1.5% chance each year of seismic disaster in the interim), and (3) the likelihood that construction of a secure transmission facility will continue to be further delayed anyway (by political and legal obstacles and challenges, etc.). History suggests that we will continue to live with unacceptably high exposure to an unprecedented water disaster for some time to come, and as we discussed it is my view that interim and emergency back-up plans should be considered, and that promising alternatives should be pursued with all possible vigor.

We discussed examples of steps that could be usefully taken to begin to prepare for emergency post-seismic repairs in order to accelerate the rate at which water deliveries could begin to be restored. Acceleration of those repairs would reduce the State-wide economic and social calamity associated with major seismic damage to the Delta, and would also reduce the risk that environmental laws would be over-ridden by executive orders (both State and Federal) and that potentially massive long-term environmental damages would be done in order to restore water deliveries as rapidly as possible.

The types of steps that we discussed are far different from the types of steps that would be taken to

improve our ability to perform the more routine "non-seismic" finite levee breach repairs that we are well used to dealing with; and no seismically useful steps of that sort have yet been taken. Coupled with the recent restrictions on water deliveries imposed over the past two years by Judge Wanger, which have served to draw down south-of-Delta "emergency" water storage reserves (despite a couple of decades of progress in increasing such emergency storage, highlighted by the construction of the Eastside Reservoir), we are currently as vulnerable as we have ever been to potential seismic disruption (for a period of multiple years) of the Delta-centric portions of our state's water supplies. It is my understanding that Judge Wanger's recent (and stunning) partial reversal of his own rulings in this regard are not so much premised on his having had a personal epiphany upon re-reading our eloquent Blue Ribbon Panel espousal of "co-equal" values; instead, they are a result of his having had the true level of vulnerability explained to him. A potential National Security issue.

Given the current level of risk, and the high stakes, interim and emergency response enhancement alternatives should be pursued. In addition to those types of alternatives that we did have time to discuss a bit, additional alternatives should be considered as well.

The "fabric pipeline" idea has potential merit here. The cost is low; apparently on the order of \$30 to \$40 million for a 6-foot diameter pipeline running fully across the Delta from a northern Sacramento River source to the Clifton Court Forebay. That would not be the entire cost, but instead only the cost of the fabric pipeline itself. Pumps would be needed at intake and to boost transmission, and a second set of pumps (at least) would be needed in the mid-Delta to pump up to the Clifton Court location (the Clifton Court pumps cannot "draw" the water by suction; "fabric" pipelines would require positive pressures and would simply collapse under any negative pressures or "suction"). So there would be additional costs for pumps, and also for intake and outflow connectivity details.

I am not an expert on fabric pipeline hydraulics, and do not know what types of circumferential stresses the fabric pipeline could safely sustain, and so I cannot estimate how much water such a line could transmit. But it would be a great deal more than zero, and in a time of emergency (and dire need), that could be a Godsend. (The fabric tubes would be largely submerged in Delta waters, and that would serve to provide an external buttressing force, and to reduce circumferential stresses; increasing capacities.) And there is no obvious reason why we would use only one such fabric pipeline. If the system works, multiple fabric pipelines could be installed; they are a "modular" potential measure.

In the event of a seismic water catastrophe in the Delta, the costs associated with such a system will not be an issue. We will expend literally billions of dollars to rapidly expedite eventual "permanent" repairs, and we will simultaneously sustain far higher economic losses and social disruption due to lack of water deliveries until that is achieved. The economics that currently prevail under "ordinary" circumstances will not be applicable; and massive Federal resources will be brought to bear.

The fabric pipelines may be a potentially feasible emergency measure to partially mitigate the current potential for a seismically induced water disaster. Apparent advantages might include:

1. Relatively low cost.
2. The apparently environmentally benign nature of the system (as compared to massive dredging, etc., and potential semi-permanent rearrangement of channels and flow to otherwise expedite "regular" levee repairs and reconstruction.)
3. The rapidity with which the system could be deployed.
4. The modular nature of the system, so that it can be progressively expanded (additional pipelines added) over the initial months after an earthquake.
5. The system itself would appear to be rapidly repairable, and so could be maintained in a resilient manner for several years in the face of urgent levee repair and reconstruction efforts.

"Potentially feasible" is an important phrase, however. This is a novel proposal, and it would need to be studied, and field tested.

I understand that the Delta Council is not funded to undertake such development work. But the Council is empowered to recommend that interim and emergency response alternatives be considered, and that promising alternatives be advanced by means of study and proof-testing (e.g. by DWR, or others.) Also that suitable investments be made (in conjunction with development of realistic post-seismic emergency response plans) in promising/viable measures.

Given its attributes, the "fabric pipeline" idea appears to warrant inclusion among potential alternatives to be considered. The fabric pipelines themselves could apparently be rapidly fabricated and deployed, but the same may not be true with regard to pumps and intake and outfall features. If fabric pipelines were to be a potentially feasible part of our arsenal of response tools, then (1) the system would have to have been proof-tested, (2) intake and outfall preparations might have to be emplaced, and (3) working pumps might have to be acquired and tested in advance of the disaster.

Given that the current levels of risk are so high, and that the prospects for a rapid implementation of a secure long-term solution (e.g. a more "permanent" seismically secure facility) are both uncertain and remote with respect to even best-case timing; undertaking expeditious efforts to evaluate and implement "interim and emergency response enhancement" alternative should have the highest possible priority.

I hope this answers your questions. If you wish to discuss this further, I can usually best be reached either at this E-mail address, or on my cell phone at (925) 899-6101.

Best regards,

Ray Seed

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**From:** RMSeed6@aol.com <RMSeed6@aol.com>  
**To:** Isenberg, Phil@DeltaCouncil  
**Cc:** Grindstaff, Joe@DeltaCouncil; Macaulay, Terry@DeltaCouncil; Nichol, Eric@DeltaCouncil; Martin, Elaine@DeltaCouncil  
**Sent:** Thu Sep 16 16:07:01 2010  
**Subject:** Re: Follow-On from our Meeting Last Week (Emergency Response Plan)

Dear Phil,

It was great to meet with everyone last week. You have a fine staff, and the questions and discussion were first rate.

I'm sorry that I'm not qualified to draft an emergency response plan... and I feel badly enough about that to pass along some potentially helpful observations. You will certainly want to have a suitable set of response plans developed as you move forward.

### Emergency Response

The keys to emergency response are planning, preparation, and practice (the three P's). Omission of any one of these is a bad idea.

Emergency response with regard to Delta flood risk has two main flavors: (1) protection of life safety, and (2) protection of water transmission and property (economic issues). Environmental issues are also important, but they will be less urgent in any disaster scenario. The key for the environment, and for the eco-systems, will be to ensure that suitable response capability is available for life safety and water supply reliability, so that those issues do not suddenly rise up during a severe emergency to "trump" (and threaten) eco-system damages that might be irreparable.

There are three basic types of risk or "threat": (1) "regular" non-seismic levee failures (e.g. overtopping, through-seepage and erosion, underseepage, slope instability, burrowing rodents, etc.), (2) potential terrorism, and (3) seismic levee damage. I'll briefly address each of these in turn.

#### 1. "Regular" Non-Seismic Levee Failures:

As we discussed, levees are very challenging due to the adverse terrain and geology upon which they must be sited, their lengths traversed, inadequate budgets for engineering field exploration and also for analysis, lack of public and political attention for long time spans, lack of budgets and/or attention for long-term maintenance, ongoing degradation over time (settlements, cracking, progressive erosion, etc.), and other issues.

Levees can be better or worse, depending upon the levels of effort and funding applied. It will never be cost-feasible to render the roughly 1,100 miles of levees in the Delta fully immune to potential failure, so we can expect that non-seismic failures will continue to occur over time.

These failures usually occur during or shortly after high-water events, and they most often occur singly (though there have been times when several occurred more or less simultaneously in a single high water event.) There have been more than 160 such failures in the Delta since 1900, and we are well-used to fixing them. So we know a good deal about it.

High water events are predictable (they can be accurately forecast), and so they are usually monitored. “Flood fighting” is the combined activity of: (1) locally inspecting and closely monitoring levees (usually by driving along the levee crests and walking the levee faces and toes) during high water events, and then (2) intervening (with construction crews, equipment, and materials) to attempt to forestall any incipient failures before they can develop fully. Flood fighting is the presumptive basis for most U.S. levee design standards; engineers (often unknowingly) intrinsically assume that flood fighting will occur when establishing design criteria, margins of safety, etc. Flood fighting is a major activity of the DWR during high water events, but usually only in situations where significant numbers of people are potentially at risk. Many Delta islands are sparsely inhabited, and many Delta levee districts (islands) in the Delta cannot afford much or any flood fighting, and so many Delta levees are often poorly monitored during periods of high water risk.

And, occasionally, levees fail not during high water events; so they “surprise” us.

#### (a) Life Safety

As we discussed, one of the keys to life safety is to understand that Delta floodwaters will be cold; typically on the order of 45° to 60°F, and that people cannot long persist (nor swim) in such temperatures. That is a stark contrast to the floodwaters from the Gulf that inundated New Orleans which, at about 82°, were akin to warm bathtub water. People were able to survive, in and out of those waters, for multiple days.

Saving lives in the Delta means getting people quickly out of the water. Fortunately, for non-seismic levee breaches, that is a fairly straightforward task.

When non-seismic levee failures occur, they are finite “breaches”. These initiate at a given location, and then as the floodwaters begin to rush through into the island these widen and deepen due to erosion (or “scour”) from the inrushing floodwaters. They often grow to widths of several hundred feet in the first hours, and then widen (and deepen) more slowly after that as the inrushing waters are slowed by the waters already ponding within the island or tract. Because these are openings of finite width, the islands fill relatively slowly. It can take up to a couple of days to fully fill a large island. So the waters rise relatively slowly.

The result is a low level of risk with regard to life safety, as people have time to migrate to higher ground (e.g. the top of the nearest levee). Sometimes people are sleeping, or distracted, and so they become trapped on top of buildings and have to be rescued. But even then, there is time available for doing that.

Most Delta islands are sparsely inhabited, so the number of people at risk is small. The exceptions are few, and they include the legacy towns, which have populations on the order of several hundreds to a few thousand, and portions of Stockton and other “cities” that encroach the edges of the Delta. For the largest of the legacy towns, it might be assumed that many would “self-rescue” (move to the nearest levee crest), and would wait there to be removed further. Less than a thousand might have to be rescued from buildings, and several hours would be available (at least) during which that could be accomplished. So a limited number of helicopters and/or boats could do the job.

Response would thus entail learning about the breach, and then mobilizing and delivering the necessary helicopters and boats. DWR are usually among the first to be notified when breaches occur, and both DWR and 911 notifications need to be routed to those who can best provide the necessary rescue resources. Preparation would consist of “education” of inhabitants as to the risk, and telling them to make their way to the nearest levee crest road if they possibly can. Otherwise, stay put and wave down rescuers as they arrive.

Helicopters and boats would have to be available, and operators of those would have to understand the situation and the timeline (as the waters rise.) Also the dangers of submerged obstacles that might sink boats. Again, planning and practice.

Recent exercises have consisted of putting small numbers of people (usually a dozen or less) into relatively warm puddles in the Delta, and then lifting them to safety with helicopters and winches; and announcing that we are well prepared. That is falsely reassuring and not very useful. Better practice scenarios would entail plucking people from rooftops or windows of buildings, with overhead power lines and antennas as possible complicating obstructions, and likely in the wind and rain (as these usually accompany high water events.) Both boats and helicopters would likely be needed.

Once people are out of the water, transport of displaced persons from the levee crest to a more permanent rescue site would then be needed, but with less urgency.

#### (b) Levee Repair, Water Transmission Reliability, and Property and Assets

The second issue is the repair of the breach, and (1) property retrieval, and (2) the restoration of safe water transmissibility.

Levee breaches are repaired by first “armoring” the two ends of the opening to prevent further erosion as tides carry water into and out through the breach twice each day. Large rock is used for this armoring. There are only a finite number of quarries that can produce such rock in the region, and only one that can do so quickly and in bulk. That is the Dutra quarry on the shore of San Pablo Bay, and it is constantly under legal siege from nearby homeowners who wish to shut it down to eliminate the noise (explosives blasting) from the quarry. [It is a noisy process, but the quarry was there

first...] The need for rock in the Delta is certainly a strategic security issue for the State of California, and likely also for the Nation, and it has long been my recommendation that either the State or the Fed's declare the Dutra quarry a vital strategic resource and so protect the availability of rock for the coming century (or so). That won't be politically popular, but you guys are empanelled to lead. The other potential sources of rock are quarries in the foothills to the east, but they cannot produce it quickly in similarly large quantities, and it must be transported by trucks (rather than by barge). If rock from these other quarries was to be stockpiled in sufficiently large quantities, then the strategic need for the Dutra quarry could be reduced.

After the two ends are "capped" (armored), a pair of arched rock berms are usually next built across the opening, creating an oval (or nearly circular) "blister" between the two berms into which ordinary soils can then be deposited. This fills the breach. These blisters usually extend some considerable distance onto the island, and are readily visible from helicopters and aircraft when you fly over the Delta. This type of repair can usually be accomplished in several weeks.

Wind-blown waves can also attack the inner slopes of levees in a flooded island. These inland faces have so erosion protection, as they are not usually in contact with water, and they can erode very quickly if they are not protected. It is often necessary to provide emergency levee slope face protection against erosion on the inside a flooded island, away from the actual breach, and stockpiles of materials and supplies (and plans) for this have advanced over recent years. More can be done here, and at small expense.

The final step is to "unwater" the island (the correct technical term for pumping out the ponded floodwaters.) This can take weeks to months, depending on the size and depth of the island, and the number of pumps mobilized.

An important policy consideration for the Council is that, prior to about 2004, the U.S. Army Corps of Engineers (USACE) used to respond jointly with DWR to address and repair Delta levee breaches. Then it was realized that the Corps was actually not supposed to be doing that; it was beyond their mission, especially as most Delta levees are "non-project" levees in which the Corps officially has no stake. So now DWR are on their own.

DWR can handle single breaches, but as we will next be discussing first multiple breaches, and then even worse seismic damage scenarios, it will become important to consider how Federal (and even potentially military) assets might be mobilized. As a policy issue; the security and reliability of the Delta and its water transmission role are key State and National security issues, and it should be possible to get the USACE formally tasked to respond to levee failures that are larger than a single, isolated breach (e.g. by Act of Congress, or similar.)

Retrieval (unwatering) of property and assets (buildings, rail lines, gas facilities, etc.) has historically been done by pumping out the islands, but there has been no systematic effort to then help with restoration of functionality. And that has worked fine

so far. Most people (and corporations, etc.) understand that there is some risk, and they have historically made their own efforts to restore their assets. Or to insure them. Some thought might be given to this by the Council. Trains can be re-routed around a damaged island, and supplemented with trucks, until disrupted rail service is restored. The PG&E gas storage facilities in the central Delta are interesting, as the Bay Area relies heavily on those during December and January (as gas transmission capacity is too limited to bring enough gas to the Bay Area during these two cold months); but we are hardly the North Pole, and this may be an acceptable risk. The current precedent is to let people (and corporations and utilities, etc.) fend for themselves in this regard. Changing that could open a can of worms. But changing the levels of protection provided Delta-wide as part of the evolution of the Delta under the Council's benevolent new management may eventually require consideration of policy changes here, as well as other potential steps such as grouping (or "bundling") of key assets into protected islands or corridors, etc.

### (c) Multiple Levee Failures

In the unusual situation wherein several levee failures occur during a single event, the issue would only be one of scale. Sufficient resources would need to be available to address several rescues, and several levee repairs. DWR would be somewhat challenged to handle this on their own, and it is here that pre-arrangement for sharing of resources and responsibilities with Federal agencies (e.g. the USACE, the Coast Guard, etc.) might begin to be especially valuable.

## 2. Terrorism

The Delta is, fortunately, not a very good target for terrorism. Clever terrorists could theoretically mobilize a number of mobile truck bombs, or similar, and could detonate them simultaneously causing multiple breaches. There would be little threat to life safety, however, and they could not reasonably expect to produce enough damage that the breaches could not be repaired and the islands pumped out in less than a single water year. If we are reasonably responsible with south-of-Delta water storage for emergencies, this would not be a very damaging scenario. There are certainly far better targets for terrorists.

Responsible south-of-Delta water storage is important here. We have worked very hard over the past couple of decades to enhance emergency water storage "downstream" of the Delta, and good progress had been made. Most noteworthy was the construction of the Eastside Reservoir by the Metropolitan Water District. Unfortunately, over the past several years, reductions in water deliveries under the environmentally driven constraints imposed by Judge Wanger have eaten deeply into "emergency" water reserves, and we were at the start of last year as potentially vulnerable as we have ever been. It was a pretty good water year, however, and Judge Wanger has now revised his own rulings after realizing the need to balance water needs for humans and for ecosystems. ("Co-equal"..... bless him!) His revision of those rulings may have involved briefings on the strategic importance (at a National level) of

being prepared for potential seismic disruption of the Delta; as will be discussed next. What is missing here, on a policy level, is a requirement that water agencies maintain some required minimum reserve for emergencies.... no matter what. Also, a requirement that water agencies do a better job of cross-connecting their lines so that in a serious water emergency the State can literally commandeer water and move it to where it is most needed. Those will not be popular issues with regard to the water agencies. But your principal concern must be the greater common good. And, as we discussed, one of the main lessons from New Orleans and Hurricane is the cost of not being prepared when catastrophe strikes.

### 3. Seismic Levee Damage

Seismic levee damage potential is not well understood, largely because we have not yet experienced it in the Delta. We have, however, seen it in many other parts of the world, and so we know all too well how it works.

One important aspect of seismic levee damage is the lack of a “weather prediction” or any other notice or warning. Earthquakes are always a surprise, and so response is always a challenge.

The main differences between non-seismic and seismic levee damage, however, are those of scope and scale. Non-seismic levee failures can produce a limited number of localized “breaches”, each of which can be relatively quickly repaired. An earthquake can produce soil liquefaction (loss of strength of sandy levee foundation soils and sandy levee embankment soils) such that the soils largely become “fluid” in their characteristics. This can produce catastrophic slumping and instability of levees, and this is not a localized phenomenon; this can occur for many contiguous levee miles. A mid-sized east bay Earthquake can produce many tens of miles of such failures, and larger events can produce more than a hundred miles of levee failures and slumping.

The result will be damages that simply cannot be rapidly repaired.

Much of the Delta will be temporarily transformed to a shallow inland bay. We will not be “filling” in finite holes (or “breaches”), instead we will be re-constructing many miles of levees largely from scratch. And much of the work will have to be done from barges. With no finite holes to fill, large rock will not be needed to armor the ends of breaches. Instead, dredging and wholesale earthmoving on a massive scale will be needed to rebuild the damaged and slumped levee sections.

It will take multiple years to accomplish this, especially if we do not make realistic and prudent preparations in advance (as is the current situation). Accordingly, restoration of water delivery will instantly become both the top State and likely also the top National priority. It is quietly expected that States of Emergency, and Executive orders, will be used to over-ride normal environmental laws, and there is a significant risk that irreparable damage may be done to ecosystems as a result of efforts to restore at least

partial water transmission and delivery as expeditiously as possible. There is no precedent for a disaster of this scale in a modern society such as ours.

Current best estimates of the likelihood of occurrence of an earthquake that would cause extensive damage to the Delta are on the order of 1% to 2% per year. The public has little understanding of that, as we have not had a major Bay Area earthquake since the Great San Francisco Earthquake of 1906. But the seismic history of the Bay Area is episodic; we get about 50 years of significant activity (multiple major earthquakes), such as occurred between 1860 and 1906, and then we get roughly a century of “quiet” as the fault systems store up new energy (as they “reload”). We are now entering a period when they are fully reloaded, and the next half century is expected to be a period of significant seismic activity.

#### (a) Life Safety

Because of the lack of warning, seismic damage and flooding will come as a surprise. The scale of the damage, which may include flooding of a majority of the Delta islands in a worst case scenario, will be extensive. Because we will not be dealing with “breaches” of finite dimensions, some islands will fill very quickly, and the rapidly rising floodwaters will pose a significant threat to life safety.

And the Delta will not be the only location affected. Appurtenant regions (e.g. the more populous Bay Area, Sacramento’s “pocket”, Natomas basin, etc.) will also likely be affected, so emergency response assets will be stretched in many directions all at once. The result is usually best described as chaos.

Given that tens of thousands of people may have to be rescued very quickly from what will quickly become dangerously deep waters in the Sacramento “pocket” and/or from the Natomas basin, it may be anticipated that many in the Delta will simply have to fend for themselves in the critical first few hours. Preparation, and education, will thus be vital.

People will need to understand the potential risk, and to have thought about what they will do. Boats will be needed, on each island or tract, that can float freely to the surface as the waters rise, and that have gas for their engines so that they can serve as a local rescue capability. People who can’t make their way to a nearby levee crest (or who have no nearby levee crest because it slumped away beneath the waters) will have to be shuttled to intact “high ground” (surviving levee crests) to await further rescue. Time will be of the essence, and people with boats will have to be taught to deposit their own families on the remaining intact levee crests, and then go back for others, rather than spending an hour or more to get their own families fully removed to solid ground. In the cold waters, those who are not quickly removed from those waters (e.g. 20 to 30 minutes or less) will suffer hypothermia, and then they will drown.

In legacy towns, which have higher concentrations of people, it would be advisable to provide some number of buildings of sufficient height (and with sufficient

rooftop accessibility, even for the old and infirm) as to represent a temporary refuge above the waters until rescue can arrive. Ditto for “urban” communities around the edges of the Delta.

Such an earthquake will be a major national event, and it will draw a full response from FEMA and other national agencies. But they will have had no warning (as opposed to hurricanes, where they do get a significant warning and so can begin to mobilize and stockpile resources even before the storm arrives), and so emergency “rescue” will be slow to arrive, and most Delta residents will have to largely fend for themselves and for their neighbors.

(b) Levee Repair, Water Transmission Reliability, and Property and Assets

Levee repair in the wake of significant seismic damage will not be done “in the usual manner”. We have no precedents, and no experience, with the expected scenario.

Current estimates are that it will take three to five years to restore the Delta sufficiently as to resume water transmission and delivery to the Bay Area and to southern California. That will create a situation without precedent, and it is difficult to predict how that will play out with regard to potential abrogation of environmental laws and other expedient measures to restore water delivery as quickly as possible.

A better solution would be to be prepared for this before it happens. We are currently fully unprepared.

Preparation would include considering serious, and potentially feasible options for dealing with a water system disaster. Potential rationing and even State or National commandeering of water supplies may occur. The San Joaquin River system, and its dams, may be re-directed towards providing water for delivery south-of-the Delta, and farming (and use of pesticides and fertilizers) in the San Joaquin watershed may be banned for several years to improve runoff quality and amounts. But that will not likely be nearly enough.

Emergency storage south-of-the-delta will, of course, also be vital. We will all have to hope that these emergency storage reserves have been diligently maintained, even in the face of what usually appear to politicians and decision-makers as “more urgent” short-term demands on such water. As a policy matter, utilities could be required to be fully diligent with regard to such emergency storage; even in the face of “regular” drought, etc..

And steps could be taken to promote reparability of the Delta, especially with an initial focus on at least partial restoration of water delivery, and in a manner that would not be devastating (over the long-term) to ecosystems or species. Both water users, and ecosystem advocates, would have an interesting common interest in this when the chips are down.

Current efforts to stockpile rock are useful for individual, finite, non-seismic failures but they will be of little value for seismic damages (except for the potential use of mobile rock barriers to re-direct streams and channels as the levees begin to be restored.) What will be needed will be massive resources, of the type that only the Federal government can reasonably bring to bear. And barges.

The Federal government should, in collaboration with the State, make realistic contingency plans for mobilizing a response akin to that type of military response with which we would expect to meet an attack on our Nation. Instead of tanks and planes, however, we'll need excavators, dredges, bulldozers, trucks, and barges.

There are only a finite number of construction barges able to do this type of work from the water available on the west coasts of North and South America. We'll need all of them, or at least as many as we can get, and plans should be made for acquiring them. Additional barges are available on the east coasts, and they can be brought through the Panama Canal.

Plans should be in place for restoration of levees and also for restoration of water system serviceability. Ecosystem considerations should be included in the criteria, and ecosystem advocates should be positively engaged here based on the understanding that in the alternative of workable solutions the resulting chaos will likely lead to less attractive approaches that will produce devastating ecosystem damages. In the all too likely case that constructive agreement proves to be unworkable, then tough decisions and contingency plans will have to be made in the absence of agreement.

It will be vital to coordinate local, State and Federal water utilities and agencies. Collaborative wielding of resources (especially storage reservoirs, and their controllable releases, and pumps, etc.) will be of vital importance, and probably over a period of several years. Response planning should include gathering together the key State and Federal decision-makers in a command center, where all necessary information can be made available and where the necessary decisions can be made; in the first hours, over the first days, and over the weeks and months that will follow. Prior agreements will have to have been reached as to who is in charge. Petty rivalries will have to be put aside. Leadership will be needed.

And "practices" will have to be held. Role playing scenarios in which the actual parties work their way through scenarios, learning their roles, tuning the overall response plans, and getting to know their counterparts (partners) from other agencies and services.

Much of this would eventually be rendered moot if the State (or the Feds) ever manage to construct a seismically robust water transmission system or facility. Prospects for that continue to be remote at this time, however, and we are currently at least seven years away from that in the best-case scenario. Any number of parties can easily delay that for a great deal longer, and it is certainly possible that the wrangling of the past 60 years will continue until an earthquake finally occurs.

And so it is advisable to also have a Plan B. Given the stakes, Plans C and D (and so on) may also be advisable.

Plans B and C might look like: (B) planning to re-work the San Joaquin River system to provide as much water as possible for south-of-Delta water needs, severe rationing, banning water use for landscaping outright, etc., in order to stretch emergency water supplies as far as possible, and (C) placing large soil berms along selected sections of a through-Delta channel that might then be “rapidly reparable” in the wake of a major seismic event.

Wide soil berms could be placed now, in preparation for a potential seismic event, on the landward side of the levees along such a channel (on the agricultural fields) with little adverse ecosystem impacts. If sections of the adjacent levees then slumped and failed during the earthquake, the adjacent elevated berms would be available to serve as the already partially constructed bases of the new (replacement) levee sections. For sections that do not slump and fail, the adjacent berm materials (soils) would be available as borrow material for use in construction of replacement levees at sections which did suffer damage. And again without major adverse ecosystem impact, as would otherwise occur with dredging of levee fill soils from the river channels. Seasonal re-establishment of partial water delivery might be rapidly accomplished in this manner, and moveable rock berms could be used to direct (and re-direct) flows as necessary due to changing water conditions and ongoing repair progress. This would be a crude and temporary water transmission system, and far from a perfect solution. And it is rife with obvious difficulties and drawbacks under “normal conditions”. But under the extraordinary duress of a major seismic water disaster it might be far better than the current situation of non-preparation coupled with denial and wishful thinking.

Better heads, gathered together and directed appropriately to consider feasible solutions, might do even better. That exercise, based on realistic understanding of the actual likely post-earthquake situation, is long overdue.

### Closure

We discussed an admirably broad range of topics yesterday, but I wanted to finish by reminding you about the attached list of potential short-term actions. Many of these would serve admirably both with regard to protection of life safety as well as education of the still largely unaware Public. They would also be fiercely resisted by select special interests, and would also run strongly counter to ever-popular denial. You would have to be courageous, or very foolish, to attempt to incorporate any of these in your plans..... but perhaps God loves a brave fool?

Best regards,

Ray

## Short-Term Actions

1. Realistic Emergency Response Plans (vs. “Denial”)
  - Realistic appraisal of the actual situation
  - Logistics (contacts, coordination, resources, chain of command, etc.)
  - Boats.... the “Natomas Navy”, on every island and tract; untethered on their trailers and with 30 feet of rope, so that they can float to the surface and be available as rescue craft. Map the locations of these, and provide boats for communities that don’t have enough. The cost would be low (most would volunteer), and administrative costs would be low as well.
  - Evacuation (mandatory standards....)
  - Plan, and practice
  - Cost of preparation vs. the cost of not being prepared (e.g. new Orleans)
  - The adverse role of denial in public policy and public safety
  - The value of back-up Plan’s B (e.g. the Deepwater Horizon platform disaster and oil spill)
  
2. Warning and Notification (and Education)
  - Two blue lines on lamp posts and sign posts at the 100-year flood level
  - Mapping and disclosure
  - Teach appropriate personal/family response planning
  
3. Preparation
  - Building codes: require neighborhoods potentially susceptible to deep inundation to have some accessible rooftops above the 100-year flood level
  - In New Orleans, the new building codes require potential egress from attics so that people won’t again be trapped and drowned by rising waters
  - Maps of locations of boats/boat marshals..... provide additional boats where needed
  - Improve levees/flood protection for larger communities (e.g legacy towns, Stockton, etc.)?

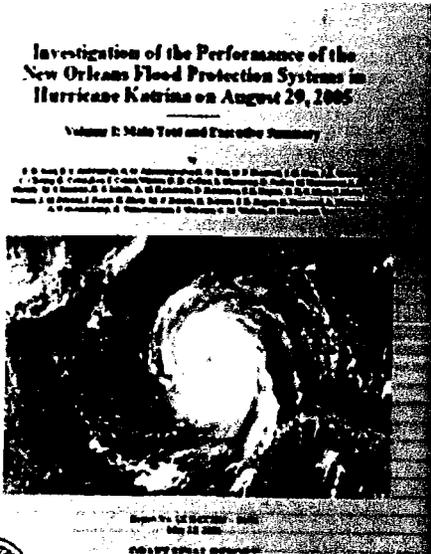


CEE > News

# NEWS & EVENTS

08.24.06

## Professor Raymond Seed Publishes Final Report on Failure of New Orleans Levee System



Over the past nine months, a national team of 38 engineers and investigators led by Professor Raymond Seed, and sponsored by the National Science Foundation and UC Berkeley's Center for Technology Research in the Interest of Society (CTRIS), conducted an independent investigation of the failure of New Orleans' levees and flood protection system during Hurricane Katrina, the largest and most costly failure of an engineered system in history. This study represented an unprecedented effort, as the large and distinguished team of leading national experts all worked as volunteers, on a pro bono basis, in order to devote the available funding to support of students, and to cover travel, field investigation and laboratory testing expenses.

The team made a thorough study of the New Orleans regional levee system, including urgent post-hurricane forensic ground investigations, field borings and laboratory testing, and extensive computer modeling and analyses.

In its final report published on July 31, the team concluded that the several dozen levee failures in this catastrophic event occurred for a number of reasons, including the choice of materials used in the levee construction, the challenging geology and unstable soils upon which they were built, efforts to achieve economic savings at the expense of reduced margins of safety, and engineering lapses associated with failure to anticipate critical failure modes and mechanisms specific to some of the failure sites. Their research indicated that a majority of the levees failed primarily as a result of human error, and not because Hurricane Katrina was an exceptionally large hurricane.



[View Final Report](#)

Professor Robert Bea, co-author of the report, added that the levees were deficient as a result of organizational problems within the U.S. Army Corps of Engineers, which oversees the design and construction of the levee system, and organizational problems endemic to the cumbersome overall system within which Congress, the Corps, and local

government and oversight agencies must coordinate their efforts to design and construct these types of complex regional systems. The report notes that the Corps' oversight of the levee system was massively hampered due to layoffs of many of its geotechnical engineers who might have otherwise more effectively overseen its design, construction and maintenance.

The UC Berkeley-led team recommends changes from the White House and Congress right on down to the local levee district level, and these include creation of a risk management council reporting directly to the President, a risk assessment office in Congress, and parallel offices at the state level. Their recommendation is not to replace the Corps of Engineers, but rather to re-establish necessary strength and support levels, and to refocus a larger fraction of its efforts on engineering rather than its current focus primarily on project management.



The report states that the principal overall lesson to be learned is that short-term savings achieved by streamlining the process of preparation for storms and other natural disasters resulted in massively larger losses when the hurricane eventually arrived; losses far out of scale with the smaller short-term savings initially achieved. This has ramifications extending well beyond the New Orleans region, and is a national issue of some urgency.

Other faculty and students from the UC Berkeley Department of Civil and Environmental Engineering who participated in this study included Prof's. Jon Bray, Juan Pestana and Michael Riemer, and a very hard working group of graduate students including Rune Storesund, Adda Athanasopoulos, Diego Cobos-Roa, Xavier Vera-Grunauer, Carmen Cheung, Kofi Inkabi and Julien Cohen-Waerber.

Professors Seed and Bea (center)  
Inspecting New Orleans Levees

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SANTA BARBARA • SANTA CRUZ

TELEPHONE: (510) 643-8678  
TELEFAX: (510) 643-8919  
E-MAIL: [bea@ce.berkeley.edu](mailto:bea@ce.berkeley.edu)  
HTTP://[www.ce.berkeley.edu/](http://www.ce.berkeley.edu/)

CENTER FOR CATASTROPHIC RISK MANAGEMENT  
DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING  
212 McLAUGHLIN HALL  
BERKELEY, CALIFORNIA 94720-1710

October 16, 2007

Terry Spragg  
Terry G. Spragg & Associates  
420 Highland Ave.  
Manhattan Beach, California 90266



Dear Terry,

- Thank you for sending me the DVD and documents related to your proposed waterbag ideas for developing and testing an emergency levee repair and emergency water transport system in the Delta.

I believe your ideas are valid and definitely worth testing. Only a test in actual Delta conditions will be able to validate your waterbag applications in the Delta. This should be easy and relatively inexpensive to accomplish.

During our phone conversations you referred to my comments on levee repair in the article titled, "*Air-dropped dams could fix levee breaches,*" in the August 2007 issue of **NEW SCIENTIST ENVIRONMENT**, in which I comment on the tests being done at the U.S. Department of Homeland Security on a self-filling bladder idea originally developed by the U.S. Department of Defense. You will note my comment in this article that this bladder idea could prove useful, "*assuming the bladders can be kept securely in place.*"

The concept that you and my U.C. Berkeley colleague, Ray Seed, have proposed, which involves placing large diameter (30 to 50 feet) water filled bladders in a levee breach perpendicular to the breach so that your towing bridle secures the bladder at both ends of the bladder on each side of the breach, could solve the problem of keeping the bladders securely in place, both during filling and after they are filled.

Your waterbag/bladder technology concept could offer four important advantages to solving the levee repair problem:

- (1) Waterbags should be easy to secure in place using your patented zipper towing connection bridle at each end of the waterbag on each side of the breach.
- (2) Waterbags should be easy to fill with water once it is secured in place at both ends.
- (3) Waterbags should be easy to remove once a permanent levee repair structure is in place. Air will be forced into the secured waterbags that are filled with water, thus evacuating the water from the waterbags, and then removing the waterbags from the repaired levee breach
- (4) Waterbags should be an easy and relatively inexpensive theory to test.

I make these comments based on my experience in investigating the failures of the flood defense systems in New Orleans after the Katrina disaster, and in my capacity at the Civil & Environmental Engineering School at U.C. Berkeley (since 1988) as co-Director of the Marine Technology and Management Group and as the co-Director at the Center for Risk Mitigation.

I hope that the Metropolitan Water District and/or the Department of Water Resources will consider testing the various waterbag emergency applications for the Delta you have proposed. I have read your "What if?" presentation that you plan to submit to the MWD Water Planning Committee. Your comments seem to confirm that you have presented several valid arguments for a test of your waterbag technology related to its many applications for California.

I would be happy to discuss your waterbag emergency ideas for the Delta and how a test of these ideas could be implemented with MWD/DWR officials. I can be reached by email at, [Bea@ce.Berkeley.edu](mailto:Bea@ce.Berkeley.edu), or by phone at (510) 642-0967.

I wish you the best of success for your endeavors.

Best regards,

A handwritten signature in black ink that reads "Bob Bea".  
Bob Bea

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** February 11, 2011  
**Status:** Posted  
**Posted:** April 04, 2011  
**Tracking No.** 80c1afbd  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0015

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Douglas Stocks

**Organization:** Palermo Ranch Kennels

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## General Comment

see attached document

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## Attachments

**EPA-R09-OW-2010-0976-0015.1:** Comment on FR Doc # 2011-03861

**From:** "prk4k9" <doug@palermoranchkennels.com>  
**To:** Erin Foresman/R9/USEPA/US@EPA

**Date:** Friday, February 11, 2011 08:54AM

**Subject:** Delta Water Quality Issue

History:  This message has been replied to and forwarded.

---

To;

Erin Foresman, US Environmental Protection Agency  
75 Hawthorne St, WTR-3  
San Francisco, CA 94105

From;

Douglas Stocks  
1560 Cox Lane  
Oroville, CA 95966

Re: Delta Water Quality

Dear Erin,

A time back I visited a family that lived on Hammer Island in the Delta. We had to go over to the island by boat as all the residents of that island a dozens of others in the delta do. During the course of the afternoon I didn't see a "septic tank" outlet where the septic was pumped. I asked the owner how often he had to have his septic pumped. He said never. I ask how that would be possible on a small island ? He said "it goes in and out with the tide " I ask without reacting with much alarm, does anyone have their tanks pumped ? He said no. These were meant to be "weekend" homes that people converted to full time residences as him and his wife had done. He later took us on a boat ride to all the small islands around there and I witnessed all the housing on these small islands dumping "raw" sewage into the delta via septic systems on a small islands. I joked with him you wouldn't need much leach line. He said, " none, "just goes in and out with the tide. Our septic tank has a big hole in the side of it. " No doubt put in by someone because if there was leach line it wouldn't drain.

Those islands need to be vacated immediately or closed septic systems installed immediately and monitored closely. The cost of having a septic pumped by boat or barge and then trucked to a sewer facility is costly so unless "closely monitored" there would be obvious abuses. Best to vacate and raze these residences and return these islands back to their natural state and get the ecosystem, fish and wildlife back to a more normal state. It will take years because of the abuses of these islands and their residences. They 'knowingly' have been dumping raw sewage into the delta for years !

Sincerely,

Douglas Stocks

# PUBLIC SUBMISSION

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Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0016

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** David C Ford

**Organization:** Private Citizen

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## General Comment

See attached document

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## Attachments

**EPA-R09-OW-2010-0976-0016.1:** Comment on FR Doc # 2011-03861

**From:** Dave Ford <davef17965@aol.com>  
**To:** Erin Foresman/R9/USEPA/US@EPA  
**Date:** Sunday, February 13, 2011 12:56PM  
**Subject:** Fwd: Comment on Delta Water Quality issues  
History:  This message has been replied to.

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Subject: Comment on Delta Water Quality issues

Subject: Comments on Delta water quality issues

These are my comments on the issue of water quality in the Delta:

1--Many blame the issue on water shortages. In actuality, the great population centers of California, now big consumers of water, set on a virtually endless supply of water, the Pacific Ocean.

50 years ago, as an engineering student, I wrote my senior paper on nuclear desalination. At that time, nuclear power was much more expensive than that from competing conventional sources. But the authors of the background material I researched stated that if desalinated water and power were both produced by a nuclear power plant, both would be less expensive than competing water and power sources.

I recently did a Goggle search on nuclear desalination--it came back with over 40,000 hits! And I have vacationed on Long Island in the Bahamas where all fresh water is produced by reverse osmosis of sea water. So it should be possible that nuclear (or solar, which also received a great number of Goggle hits) desalination could be a way to replace, or at least reduce, municipal demands on Delta water.

2--Water intensive crops don't belong in most of California. Phil Isenberg, the former mayor of Sacramento has spoken about a call he received while mayor from the US State Department concerning attending a conference of mayors of desert cities--It was the first time he realized that Sacramento was in a climatological desert! Despite this, water intensive crops are being grown in the Sacramento Valley.

Valley farming interests have sued the California Department of Fish and Game over the striped bass in the Delta, an Introduced species, Introduced 130 years ago! And until water demands began increasing, resulting in withdrawals from the Delta, fish species co-existed in large numbers. In effect, The farm interest want the striped bass removed, blaming them as the cause of the depletion of native species. If that is the case, how about removing non-native farm crops as well?

David C. Ford  
8450 Erika Jean Way  
Fair Oaks, CS 95628

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
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**Status:** Posted  
**Posted:** April 04, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0017

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Jon A. Hammari

**Organization:** Private Citizen

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## General Comment

See attached file

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## Attachments

**EPA-R09-OW-2010-0976-0017.1:** Comment on FR Doc # 2011-03861

**From:** jhammari@netscape.net  
**To:** Erin Foresman/R9/USEPA/US@EPA

**Date:** Tuesday, February 15, 2011 01:08PM

**Subject:** CA Bay-Delta pollution

History:      ✦ This message has been replied to.

---

Dear EPA,

Please include the toxic build-up of selenium in your evaluation of CA Bay-Delta pollutants. I believe that pumping fresh water onto the Westlands Water District's selenium-rich soil is a waste of precious water and energy. The boutique crops grown on this hilly terrain would best be replaced by commercial development along this busy stretch of Interstate 5. Such improvement would better manage run-off than does the current practice of wasting fresh water simply to dilute the toxic effluent of these orchards. The luscious soils and rivers of the valley should be used for agriculture, not housing and commerce.

Thank you,  
Jon A. Hammari  
5952 Wedgewood Ave.  
Carmichael, CA 95608

# PUBLIC SUBMISSION

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Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0018

Comment on FR Doc # 2011-03861

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## Submitter Information

**Organization:** Rutgers Law

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## General Comment

See attached file(s)

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## Attachments

**EPA-R09-OW-2010-0976-0018.1:** Comment on FR Doc # 2011-03861

**Date: April 10, 2011**

**Re: Comment to EPA's Advanced Notice of Proposed Rulemaking, "Water Quality Challenges in the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary"**

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The EPA recently released an Advanced Notice of Proposed Rulemaking seeking comments from interested parties on the water quality conditions affecting aquatic resources in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay Delta Estuary or Estuary) in California.<sup>1</sup> Specifically, the EPA is asking for commenter's to consider broadly whether EPA should be taking new or different actions under its programs to address recent significant declines in multiple aquatic species in the Bay Delta Estuary, and is not limiting its request for comments that would require rulemaking. The EPA notes that other solutions, like research, enforcement and changes to water quality standards may be in the range of changes to the EPA's activities that would be beneficial to the Bay Delta Estuary.

There are a variety of factors affecting the decline of aquatic life in the Bay Delta Estuary: contaminants in the waterways like ammonia and ammonium, selenium, and pesticides; invasive species; and the increasing diversion of freshwater for agriculture and drinking purposes increasing the salinity levels. The convergence of these factors greatly impacts the quality of the water. As noted by this ANPR, "EPA is mindful that the more significant concern is the cumulative and interactive effects of multiple stressors on the Bay Delta Estuary's aquatic inhabitants."<sup>2</sup>

In the unabridged ANPR, EPA notes the difficulty in evaluating and addressing contaminants in the Bay Delta Estuary due to the absence of a comprehensive water quality monitoring program.<sup>3</sup> Some contaminants are monitored only on an incidental or occasional basis, or not at all. Any data that is currently collected on the contaminants in the waterways is done by multiple agencies with little or no standardization to the method used. Even more problematic, the data is not readily accessible in any single database.<sup>4</sup> This comment seeks to address the data gap on contaminant levels and their interaction with the physical environment of the Delta Bay Estuary.

For the EPA to provide any regulation or changes to the contaminant levels in the Bay Delta Estuary, it must first obtain consistent accurate data on the different levels and types of contaminants. Furthermore, data is needed on how these contaminants interact with each other, and with the physical environment of the Estuary waters. Consistent information of this type is necessary for developing and implementing Total Daily Maximum Loads (TMDL's) or the level of pollutant that a water body can receive and still safely meet water quality standards.

The EPA should consider establishing a database where the different parties who are currently collecting this data could enter their research. It is important to have as much information as possible in one place to begin to fully understand the effects of the contaminants on the water to create effective TMDLs. To ensure that

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<sup>1</sup> Water Quality Challenges in the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary, Environmental Protection Agency, , 40 CFR Chapter I, (February 22, 2011) <http://regulations.justia.com/view/223948/>

<sup>2</sup> 76 FR 36, 9712.

<sup>3</sup> Unabridged Advanced Notice of Proposed Rulemaking, [http://www.epa.gov/region9/water/watershed/sfbay-delta/pdf/BayDeltaANPR-fr\\_unabridged.pdf](http://www.epa.gov/region9/water/watershed/sfbay-delta/pdf/BayDeltaANPR-fr_unabridged.pdf), Page 21.

<sup>4</sup> *Id.*

information being entered into any centralized database is accurate; the EPA should consider creating guidelines on what constitutes industry wide good water quality testing procedures.<sup>5</sup> Standardizing the tests and procedures used will help to ensure data integrity within the database.

As noted by the EPA, the contaminants themselves are problematic, but even more so is their interaction with each other and the multiple stressors of the physical environment of the Bay Delta Estuary. Collecting data on the physical environment of the water would probably require consistent research in multiple areas of the Estuary. This would seemingly require multiple people collecting data from multiple areas, but in a consistent manner. Since funding this type of research may not be possible, EPA may consider enlisting the help of the many educational institutions throughout region to engage students in the task of testing the waters of the Estuary.

It may be possible to enlist local schools to make water quality testing in the Estuary part of the science curriculum. Creating a program wherein schools who participate can receive the small amount of funding it would be necessary to have students test the waters of the Estuary for things like pH, salinity, color, odor, and temperature. Testing can be done easily in a school lab without much costly equipment. Data collected could also be put into the database created by the EPA. Researchers would begin to have a dataset that not only shows the different types and levels of harmful contaminants in the water of the Bay Delta Estuary, but also the characteristics of the physical environment in various locations throughout the Estuary. This type of project would allow for consistency of datasets because the EPA could develop the procedures to test the water and provide the materials so all schools are using the same supplies. Human error would have to be accounted for, but if there is a large enough data set, that may not be an issue.

The EPA may consider looking to the worldwide water experiment currently underway sponsored by the International Year of Chemistry entitled, "Water: A Chemical Solution."<sup>6</sup> The global experiment seeks to have students around the world test the salinity and pH of water bodies in their regions and then submit the data into a collaborative worldwide database.<sup>7</sup> Implementing something like the global water experiment at the state level could be possible to collect data on the Bay Delta Estuary. Furthermore, it might provide the additional benefit of educating students and having them become invested in the environmental issues of their local community.

The EPA noted that currently 70% of pesticides used do not require reporting and this is a particular problem for gaining accurate data on pesticides contribution to the decline of the aquatic life of the Bay Delta Estuary.<sup>8</sup> The EPA notes, "It is difficult to accurately estimate source contributions of land-based pesticide applications due to an incomplete record of pesticide use, inadequate water quality monitoring data and the diversity of current-use

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<sup>5</sup> Much like the Good Clinical Practice guidelines used by the FDA (and internationally) which provide standards for developing and running clinical trials on humans.

<http://www.fda.gov/downloads/Drugs/GuidanceComplianceRegulatoryInformation/Guidances/UCM073122.pdf>

<sup>6</sup> The International Year of Chemistry, Global Water Experiment, "Water a Chemical Solution," [http://water.chemistry2011.org/c/document\\_library/get\\_file?uuid=ca25cc05-6e5c-451a-bb3f-86665049477f&groupId=16704](http://water.chemistry2011.org/c/document_library/get_file?uuid=ca25cc05-6e5c-451a-bb3f-86665049477f&groupId=16704) (Last visited April 8, 2011).

<sup>7</sup> <http://water.chemistry2011.org/web/ivc>

<sup>8</sup> See Unabridged ANPR, 39.

pesticides.”<sup>9</sup> If the EPA would find it helpful, it may consider soliciting information from consumers on the types of pesticides they are using in their homes and their general location. Collecting this data may give researchers a better idea of what chemicals are entering the waterways and interacting with each other. Obviously, this has many problems; there would be no way to verify the information being submitted, and there is no incentive for people to do this other than out of concern for the environment. Furthermore, the EPA would likely have to spend time and money publicizing their effort to collect this data, which may not actually be helpful. However, finding a way to collect this data may be a way to find the major sources of land based pesticide use.

Due to the delicate eco-system of the Bay Delta Estuary, the EPA should seek to collect and analyze data on the water quality prior to any further rulemaking. Since any effort made to help the aquatic life in the Estuary will likely go on to impact other functions the waters of the Bay Delta Estuary, EPA should seek solutions that will provide the least amount of impact to the Estuary’s other functions. Prior to making any official rule the EPA should first compile enough data to understand the impact of the various contaminants in the water and be able to create reliable forecasting models. This may help create more targeted solutions to preserve the aquatic life of the Estuary without having to risk detriment to the other important functions of the water of the Estuary.

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<sup>9</sup> See Id.

# PUBLIC SUBMISSION

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**Submission Type:** Web

**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0019

Comment on FR Doc # 2011-03861

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## Submitter Information

**Organization:** Student

**Government Agency Type:** Federal

**Government Agency:** EPA

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## General Comment

See attached file(s)

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## Attachments

**EPA-R09-OW-2010-0976-0019.1:** Comment on FR Doc # 2011-03861

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**\*\*Background on the “Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary” ANPR is provided in a separate document.\*\***

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**NAME:** Anonymous

**TO:** EPA

**AGENCY:** Environmental Protection Agency

**ACTION:** Advance Notice of Proposed Rulemaking

**RE:** Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**DATES:** Written comments must be submitted by April 25, 2011

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## **Comment on EPA's ANPR on Water Quality in the Bay Delta Estuary**

The U.S. Environmental Protection Agency's Advanced Notice of Proposed Rulemaking (ANPR) on the effectiveness of current water quality programs influencing the health of the San Francisco Bay Delta Estuary is an excellent first step to addressing the area's poor water quality and the harms that this poor water quality creates. First, this ANPR identifies that this is a start to much needed research and possible implementation of more concrete regulations for the Bay Delta, as well as stricter compliance with federal statutes such as the Clean Water Act to deal with the current pollution.<sup>1</sup> Second, this ANPR does a thorough job of identifying most of the crucial water quality issues affecting Bay Delta fisheries, communities, and its entire ecosystem; it also calls for extensive research, policy and scientific instruction on how to best remedy each of these problems. Third, since much of the EPA's statutory mandate is to perform oversight and review of state water quality agency activities, this ANPR clearly describes the regulatory measures currently underway and explains an information-gathering process on how the EPA and the state of California can achieve water quality and aquatic resource protection goals to improve the very ecologically diverse and important aquatic habitat.<sup>2</sup>

Essentially, the ANPR effectively resolves to cover a number of topics that affect the Bay Delta Estuary. Seeking further scientific and regulatory instruction seems to be the most effective approach. Since existing state laws governing the Bay have fallen ineffective, it would be a wise choice for the EPA to step in and take control of this very important area. This is so especially since there has been a long-standing problem of pollution in the Bay Delta<sup>3</sup> and this pollution creates far-reaching effects. This attempt to understand what is actually affecting the Bay the most – whether it be the salinity factor from too many housing projects,<sup>4</sup> over-pumping to Southern California, various dumping of contaminants from companies and municipalities (such as municipal waste being dumped into the Bay from the islands and other areas),<sup>5</sup> the serious state of affairs calls for immediate attention from the EPA to regulate the area.

The proposed regulation will most likely be welcomed from most citizens surrounding the Bay. The research and understanding required to obtain water quality standards is absolutely necessary at this stage of the pollution in the Bay Delta. Since the Delta Bay Estuary is critical to California's social, political, economic and ecological well-being, and its health serves competing interests (such as in-Delta agriculture, water exports, and flood control) that have significantly altered its waterways, flows, and adjacent lands, a survey method approach adopted by the EPA in this regulation is a meaningful strategy to bring the most healthy change to the Delta Bay.

The ANPR addresses several regulatory components of the Clean Water Act that are relevant to the Delta Bay Estuary, including water quality standards under Section 303(c), point source discharge regulation under the National Pollution Discharge Elimination System (NPDES) program under Section 402, the listing of impaired waters with responsive Total Maximum Daily Load (TMDL) calculations under Section 303(d), nonpoint source management programs under Section 319, and the wetlands regulatory program under Section 404.<sup>6</sup> Still, this ANPR effectively seeks to combine efforts with other statutes and programs for the goals of a reliable water supply and a restored Delta ecosystem since there are already both federal and state water resource planning efforts underway in the Bay Delta Estuary.<sup>7</sup> The ANPR is also effective in how it addresses the ways in which the state of California will need to work with the federal government to ensure that this plan for better water quality in the Delta Bay is properly carried out. Since the EPA is coordinating its review of water quality issues with the on-going development of the Bay Delta Conservation Plan,<sup>8</sup> this ANPR is a solid foundation on which to build to develop a strategic proposal for future EPA efforts toward protecting the Bay Delta. The ANPR delves into great detail to identify and explain a variety of water quality stressors and the role they each play. This analysis is an important complement to the science-based analysis going into the Bay Delta Conservation Plan effort. The ANPR identifies specific issues that the EPA has regulatory responsibility for including potential changes to site-specific water quality standards and pesticide regulation.

While the ANPR is an important first step to research the several aspects of the pollution in the Delta, the specific attention to total maximum daily loads (TMDL's) is also notable. The Bay Delta's listing on the 303(d)(1)(A) list is necessary to begin to address these issues and identify the contributors. Two particular types of point source discharges are of particular interest in the Bay Delta Estuary. First, discharges from POTWs have been identified as possible contributors to impairments in the Bay Delta Estuary. There are ten POTWs discharging into the Bay Delta Estuary with a discharge capacity of ten million gallons/day or more.<sup>9</sup> In recent years, the Water Boards have been updating and, generally, strengthening effluent discharge restrictions in some of the NPDES permits.<sup>10</sup> For example, the renewal of the City of Stockton's Waste Water Treatment Plant NPDES permit in 200269 and subsequent Cease and Desist Order<sup>70</sup> required a wastewater treatment plant upgrade including nitrification facilities to meet effluent restrictions on ammonia/ammonium discharges and protect downstream designated uses.<sup>11</sup> The ANPR also benefits residents of the area by addressing the Sacramento Regional Wastewater Treatment Plant permitting action.<sup>12</sup>

Acting on behalf of the "San Francisco Local Neighborhood Environmental Association"<sup>13</sup> in support of stricter regulations, the proposed regulation will serve the interests of the community and

economy of Central California. The different approaches under the Clean Water Act Section 404 program that the EPA should consider, in consultation with the U.S. Army Corps of Engineers, to improve the protection of aquatic resource functions in the Bay Delta Estuary are more required permitting of dumping contaminants, more research into the parties responsible and more insight into alternative ways of relocating fresh water for crops (especially rice and cotton crops) and drinking water for Southern California. In the interests of my client and other community constituents, to begin to improve its delicate ecosystem, the Bay Delta must continue to receive fresh waters instead of draining the Bay Delta or diverting water to Southern California. The divergence of water, the increased salinity and the overall heavy consumption of the Bay Delta waters is extremely taxing to the entire ecosystem.<sup>14</sup> This ANRP must adequately address these issues as well as any ideas to further expand canals that could have long and devastating impacts on the region. Pumping out the freshwater, to only leave the dumped contaminants will have serious health and economic effects on the entire Bay Area.

Moreover, my “client” and community constituents eagerly await the regulations specifically pertaining to wetlands. The existing information relating to the relationship between the quantity and quality of wetlands and Bay Delta Estuary water quality and fish populations requires that further research be explored in this area. In light of projected impacts of climate change (including sea level rise and its effects on levee stability), to be most in compliance with the Clean Water Act, the EPA must manage the specific activities that the EPA can undertake to improve long-term protection of existing and future wetlands, especially those resources on subsided islands.<sup>15</sup> The sewage problem of dumping of municipal waste from these homes on the islands calls for immediate action from the EPA and regulations pertaining to this.<sup>16</sup> Since 1972, the Clean Water Act has imposed limits on discharges in waters, which also regulates wetlands. Since permits are required for discharges from point sources,<sup>17</sup> and under Section 1342 of the Clean Water Act, any person who discharges pollutants into waters of the United States from any point sources needs a permit, this regulation seeking to encourage stricter regulation is welcomed in this community.<sup>18</sup>

There are several policy reasons to imposing this proposed regulation. These wetlands are important to protect the coast and aid the failing levy system. The wetlands filter out pollutants resulting from dumping, accommodate a huge breeding ground for bait fish and nurseries, and are a place for stormwater to accumulate, which is especially important for flood control in the region. For these reasons and all other factors affecting the Bay Delta Estuary, the EPA should move forward in its proposed regulation of the Bay Delta to curtail pollution and preserve the ecosystems of the Delta Bay and improve the conditions for the affected community.

## **RELEVANT SECTIONS OF CLEAN WATER ACT**

**Section 303(c):** water quality standards

**Section 303(d):** of impaired waters with responsive Total Maximum Daily Load (TMDL) calculations

**Section 309, Enforcement:** Many ways for federal gov't to get civil penalties - suits, administrative orders, etc. and Criminal penalties.

**Section 311:** covers discharge into waters. Owner/operator of facility/vessel liable. **SPCC** - spill prevention contingency and countermeasure program - geared towards facilities with tanks of a certain number/size, different for above and below ground tanks.

**Section 319:** nonpoint source management programs

**Section 404:** prohibits discharge of fill/dredged materials into waters, defined to include many wetlands.

**Section 402:** point source discharge regulation under the National Pollution Discharge Elimination System (NPDES) program

## RELEVANT CASES IN CALIFORNIA

**Westlands Water Dist. v. United States, Dep't of the Interior, Bureau of Reclamation, 850 F. Supp. 1388 (E.D. Cal. 1994)** (private environmental groups and several public water agencies sought and were granted mandamus relief to require implementation of a water flow plan that was designed to protect salmon. The efforts of the private environmental groups could not be deemed unnecessary and duplicative in hindsight based on the success of the public water agencies. Because there was no public attorney general available to pursue the litigation, the private environmental groups did not have to show that their efforts were necessary and valuable to the ultimate outcome of the case).

**Phelps v. State Water Resources Control Bd., 157 Cal. App. 4th 89 (Cal. App. 3d Dist. 2007)** (California State Water Resources Control Board's unauthorized diversion of water).

**El Dorado Irrigation Dist. v. State Water Resources Control Bd., 142 Cal. App. 4th 937 (Cal. App. 3d Dist. 2006)** (Defendant, the California State Water Resources Control Board, sought review of a judgment from the Superior Court of Sacramento County (California), which issued a writ of mandate directing the board to set aside its decision to include a term in plaintiff senior appropriator's permit that required the senior appropriator to curtail its diversion of water when stored water was being released from public projects to meet water quality objectives. Affirmed).

**State Water Resources Control Bd. Cases, 136 Cal. App. 4th 674 (Cal. App. 3d Dist. 2006)** (State Water Resources Control Board and various water rights holders sought review of rulings of the Superior Court of Sacramento County (California) that the Board failed to implement all of the flow objectives in a water quality control plan and that the Board had to expand the authorized place of use to include all of a service area without any mitigation requirement. The court affirmed in part, modified, and reversed the judgments. On a joint points of diversion petition, the Board conditionally granted the United States Bureau of Reclamation and the Department of Water Resources the right to use each other's pumping plants to export water to other areas. On a change petition, the Board approved the Bureau's requests to conform the purposes of use in its permits and to change the places of use in its permits, but only in part. The court held that the Board erred when it failed to allocate responsibility for meeting all of the flow objectives in the plan. The Board was not entitled to implement alternate flow objectives agreed to by various interested parties in lieu of the flow objectives actually provided for in the plan. The court also held that the Board failed to adequately implement certain salinity objectives in the plan and failed to implement the minimum flows necessary to achieve the narrative objective for salmon protection in the plan. The Westlands Water District Merger Law, Wat. Code, §§ 37800-37856, did not impose a ministerial duty on the Board to augment the authorized place of use in the permits of the Bureau to include all of the lands within the service area without mitigation).

**O'Neill v. United States (9th Cir. 1995) 50 F.3d 677** (Ninth Circuit held that a "shortage" provision in Westlands's contract relieves the federal government of liability for reallocations of water mandated by the federal Endangered Species Act or the CVPIA. (50 F.3d at 682-687.) The *O'Neill* court did not decide whether the reallocations of water at issue had in fact been required by operation of those statutes; it held that the district court had acted within its discretion in leaving that question to a parallel federal action. (50 F.3d at 687-689.)

**Westlands Water District, et al. v. Natural Resources Defense Council, et al.** (9th Cir. 1994) 43 F.3d 457, 461. (Ninth Circuit found that notwithstanding any other provision of" the CVPIA, any reallocation

of CVP water to new purposes of use must be done "in a manner consistent with the provisions of applicable State law (CVPIA § 3411)).

## ENDNOTES

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<sup>1</sup> Water diversions for agriculture and public water supply at times reduce the amount of estuarine habitat for aquatic species and interfere with chemical cues used by salmon to navigate to and from inland tributaries between the Estuary and the Pacific Ocean. Over time, the Estuary has lost more than 95% of its tidal wetlands, floodplains, and sloughs, destroying the majority of pollution filtration, flood storage services and important spawning habitat. Climatic trends also present challenges for managing estuarine resources, as salt water moves inland with sea-level rise and warmer water temperatures shorten spawning opportunities. Unabridged Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta, Page 89. February 2011. United States Environmental Protection Agency. Document ID: EPA-R09-OW-2010-0976-0002. Available at: <http://www.regulations.gov/#!documentDetail;D=EPA-R09-OW-2010-0976-0002>.

<sup>2</sup> EPA also provides annual grants to California to carry out Clean Water Act programs, including the programs under Sections 106 and 319. *Id.* at 18.

<sup>3</sup> EPA formally disapproved California's water quality standards in the Bay Delta estuary in the early 1990's after determining they were not sufficiently protective. As required under Clean Water Act Section 303, EPA then proposed and promulgated replacement water quality standards, which were ultimately incorporated into the historic state-federal-stakeholder agreement on Delta protections (the "Bay-Delta Accord") and, where appropriate, into the state water quality control plans.

Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Frequently Asked Questions. February 10, 2011. Available at <http://www.epa.gov/region9/water/watershed/sfbay-delta/pdf/BayDeltaANPR-FAQs.pdf>.

<sup>4</sup> The Clean Water Act Section 404 Program is a significant component of the Clean Water Act regulatory framework in the Bay Delta Estuary. The California State Reclamation Board estimates that approximately 130,000 new homes are at various stages of planning and implementation within the Bay Delta Estuary, potentially converting up to 55,000 acres of tracts and islands that are near or below sea level to urban landscape. Other potential large projects that could result in the discharge of dredge or fill material to protected waters include

building a new conveyance through or around the Delta to divert water from the Sacramento River south to the export facilities in the southern Delta, dredging of the Sacramento and Stockton (San Joaquin) deepwater ship channels, tidal barrier projects, large-scale restoration activities, and a large-scale (22,000 acres) water storage project. Unabridged Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta. Page 69. February 2011. United States Environmental Protection Agency. Document ID: EPA-R09-OW-2010-0976-0002. Available at: <http://www.regulations.gov/#!documentDetail;D=EPA-R09-OW-2010-0976-0002>.

These potential large projects may require Clean Water Act Section 404 permits, and some have the capability to negatively impact water quality in the Bay Delta Estuary. While potentially improving export water quality and reducing fish entrainment at the south Delta export facilities, any conveyance project that diverts relatively clean Sacramento River water before it enters the Bay Delta Estuary also has the potential to exacerbate existing water pollution problems (such as increased salinity and low dissolved oxygen) in the Bay Delta Estuary. Dredging operations have the potential to re-suspend sediments and contaminants, thereby contributing to existing water quality impairments. Tidal barrier and storage projects have the potential to reduce circulations in areas of the Estuary that suffer from salinity and low dissolved oxygen impairments. Urban development of Bay Delta Estuary rural islands and tracts eliminates the ability of these areas to retain and assimilate sediment and associated contaminants and store and absorb flood waters. Statewide, salt marsh and riverine wetlands are showing declining function as a result of urbanization. Conversion of agricultural land use to urban land

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use on these islands and tracts may also adversely impact water quality as higher urban stormwater and POTW discharges increase the volume and array of pesticides and contaminants discharged into the adjacent waterways. Unabridged Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta. Page 70. February 2011. United States Environmental Protection Agency. Document ID: EPA-R09-OW-2010-0976-0002. Available at: <http://www.regulations.gov/#!documentDetail;D=EPA-R09-OW-2010-0976-0002>.

<sup>5</sup> Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Frequently Asked Questions. February 10, 2011. Available at <http://www.epa.gov/region9/water/watershed/sfbay-delta/pdf/BayDeltaANPR-FAQs.pdf>.

<sup>6</sup> *Id.* at 11; 40 CFR Chapter I. [EPA-09-OW-2010-0976-FRL-9268-5] RIN-2009-ZA00.

<sup>7</sup> Stakeholders and relevant government agencies are engaged in developing the Bay Delta Conservation Plan (BDCP) under the federal ESA and the California Natural Community Conservation Plan Act (NCCP). Unabridged Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta. February 2011. United States Environmental Protection Agency. Document ID: EPA-R09-OW-2010-0976-0002. Page 11. Available at: <http://www.regulations.gov/#!documentDetail;D=EPA-R09-OW-2010-0976-0002>. The BDCP focuses on the recovery of ESA-listed species and their habitat in the Bay Delta Estuary and is expected to include major proposals for changing how water is diverted and conveyed through the Bay Delta Estuary to the state and federal water export pumping facilities in the south Delta. *Id.* The EPA's responsibilities under the Clean Water Act to protect designated uses, such as estuarine habitat, fish migration, and threatened and endangered species, overlap with ESA requirements being addressed in the BDCP. Some actions taken pursuant to the BDCP will need to comply with both the ESA and Clean Water Act. To that end, EPA will ensure that any action it might take as a result of this ANPR will be closely coordinated with other federal and state actions related to the BDCP, any biological opinions on water operations affecting the Bay Delta Estuary, and any other actions requiring ESA compliance. *Id.*

<sup>8</sup> This plan is currently being developed through a collaboration of federal, state and local agencies, environmental organizations, and other interested parties.

<sup>9</sup> Unabridged ANPR, *supra* note 1 at 20.

<sup>10</sup> Unabridged ANPR, *supra* note 1 at 20.

<sup>11</sup> Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Frequently Asked Questions. February 10, 2011. Available at <http://www.epa.gov/region9/water/watershed/sfbay-delta/pdf/BayDeltaANPR-FAQs.pdf>.

<sup>12</sup> Advanced Notice of Proposed Rulemaking for Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Frequently Asked Questions. February 10, 2011. Available at <http://www.epa.gov/region9/water/watershed/sfbay-delta/pdf/BayDeltaANPR-FAQs.pdf>.

<sup>13</sup> Fictitious organization for the purpose of this comment, but meant to address the needs of community members affected by the pollution in the Bay Delta.

<sup>14</sup> United States Geological Survey. Seasonal/Yearly Salinity Variations in San Francisco Bay Available at: [http://sfbay.wr.usgs.gov/hydroclimate/sal\\_variations/index.html](http://sfbay.wr.usgs.gov/hydroclimate/sal_variations/index.html)

<sup>15</sup> Glen Martin, *Chronicle* Staff Writer. Our Poisoned Bay / Despite end to direct piping of sewage, pollution worse now than 30 years ago. (New construction near San Francisco Bay National Wildlife Refugee near Newark has encroached on the wetlands. Experts maintain the expansion of these wetlands is necessary for the restoration of the bay.) August 02, 1999. Available at: [http://articles.sfgate.com/1999-08-02/news/17695579\\_1\\_east-bay-water-pollution-estuaries](http://articles.sfgate.com/1999-08-02/news/17695579_1_east-bay-water-pollution-estuaries).

<sup>16</sup> Coalition for a Sustainable Delta. *A Complex Puzzle: Delta Stressors. Municipal Wastewater and Industrial Discharges*. Available at: <http://www.sustainabledelta.com/municipal.html>

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<sup>17</sup> Point source - 502(12) - any discernable confined and discreet conveyance from which pollutants are/may be discharged

<sup>18</sup> However, since regulation of point sources is not always sufficient to attain ambient water quality standards in all waterbodies, the ANPR thankfully identifies that Clean Water Act Section 303(d)(1)(A) requires each state to identify and prioritize those waters where technology-based controls are inadequate to attain water quality standards: Each State shall identify those waters within its boundaries for which the effluent limitations required by section 1311(b)(1)(A) and section 1311(b)(1)(B) of this title are not stringent enough to implement any water quality standards applicable to such waters.

# PUBLIC SUBMISSION

**As of:** April 27, 2011  
**Received:** April 25, 2011  
**Status:** Posted  
**Posted:** April 26, 2011  
**Tracking No.** 80c37ce2  
**Comments Due:** April 25, 2011  
**Submission Type:** Web

**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0026

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Pat Borison

**Organization:** Self

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## General Comment

The Delta needs a balanced state water plan. Any exports of water for farming should be used for farming and NOT traded or sold for new housing permits. Keep the Delta safe for boating and healthy for wildlife and fish. It is NOT a plumbing fixture. Southern California needs to first look at ways to save water or reduce use and not assume Delta water is there for the taking. Listen to people who live and work on the Delta - they know it best.

# PUBLIC SUBMISSION

|                                     |
|-------------------------------------|
| <b>As of:</b> April 27, 2011        |
| <b>Received:</b> April 25, 2011     |
| <b>Status:</b> Posted               |
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0028

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Irwin Haydock, PhD

**Organization:** Public

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## General Comment

It is my professional opinion that the only stressors of any consequence are salt and fresh waters that mix and interact in determining the natural variability and sustainability of the Bay Delta Estuary. The predicted future tidal rise will just exacerbate the situation and will squeeze the remaining life from the estuary. For many decades this natural fresh-salt water balance has been upset by excessive water withdrawals for export south of the Delta. This pattern has occurred in both wet and dry years, and most seriously during drought years. The San Francisco Bay-Delta system formed and evolved over 1000's of years. Like many other estuaries throughout the nation and world-over diversions of excessive amounts of fresh water for human use has too often resulted in eventual demise of the system itself. In the Sacramento-San Joaquin delta salinization is the greatest enemy of a healthy estuary. Except in localized situations, most if not all the other stressors of concern are of no major import if enough flow remains to adequately flush these concentrated elements from the system. But, over the past 100 years the retention time in the Bay-Delta has gone from mere months to years, and the system has therefore been overwhelmed by the accumulation and interaction of all these other stressors. Ammonia from the Sacramento Sanitation District's discharge would not be a problem if adequate flushing of the system had not been retarded with excessive flow diversions in the past few decades.

In summary, health and productivity in estuaries are governed primarily by freshwater flows, flushing and salt balance provided by tidal motion.

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## Attachments

**EPA-R09-OW-2010-0976-0028.1:** Comment on FR Doc # 2011-03861

Erin Foresman  
U.S. Environmental Protection Agency  
75 Hawthorne Street  
San Francisco, CA 94105

Subject: EPA ANPR, February 10, 2011; Public Response due by April 25, 2011

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. EPA's ANPR solicits public Input on how water quality and aquatic resource protection goals can be achieved in the Bay Delta Estuary. This action requires an assessment of the effectiveness of current programs designed to protect water quality and aquatic species habitat in the San Francisco Bay/Sacramento-San Joaquin Delta in California (Bay Delta Estuary)

This ANPR discusses water quality contaminants including ammonia, selenium, and pesticides, as well as physical characteristics such as temperature, salinity and wetland habitat that are important to aquatic species. It also summarizes the regulatory framework for each of these stressors. EPA is soliciting comment on how to best use Clean Water Act programs to improve Bay Delta Estuary water quality. Strangely, "no new rules are proposed and the ANPR has no regulatory effect." This latter statement essentially assures that the ANPR will not be taken seriously; this was exactly the result of the recent SWRCB report on new flow standards for the system. EPA's ANPR and materials are at: [www.epa.gov/region9/water/watershed/sfbaydelta](http://www.epa.gov/region9/water/watershed/sfbaydelta)

The basic problem is stated as present water quality in the Bay Delta Estuary reflects the cumulative and interactive effects of multiple physical, chemical and biological stressors, including sewage flows, storm water discharges, agricultural return flows, urban and agricultural pesticide application, water diversions, habitat degradation and non-native species introductions. The cumulative effect of these stressors has been to impair Bay Delta Estuary sustainability as a viable habitat for a rich mix of productive species. The system has essentially been converted into a single-purpose hub of California's water distribution system, bypassing the heart and soul of the natural delta.

It is my professional opinion that the only stressors of any consequence are salt and fresh waters that mix and interact in determining the natural variability and sustainability of the Bay Delta Estuary. The predicted future tidal rise will just exacerbate the situation and will squeeze the remaining life from the estuary. For many decades this natural fresh-salt water balance has been upset by excessive water withdrawals for export south of the Delta. This pattern has occurred in both wet and dry years, and most seriously during drought years. The San Francisco Bay-Delta system formed and evolved over 1000's of years. Like many other estuaries throughout the nation and world-over diversions of excessive amounts of fresh water for human use has too often resulted in eventual demise of the system itself. In the Sacramento-San Joaquin delta salinization is the greatest enemy of a healthy estuary. Except in localized situations, most if not all the other stressors of concern are of no major import if enough flow remains to adequately flush these concentrated elements from the system. But, over the past 100 years the retention time in the Bay-Delta has gone from mere months to years, and the system has therefore been overwhelmed by the accumulation and interaction of all these other stressors. Ammonia from the

Sacramento Sanitation District's discharge would not be a problem if adequate flushing of the system had not been retarded with excessive flow diversions in the past few decades.

In summary, health and productivity in estuaries are governed primarily by freshwater flows, flushing and salt balance provided by tidal motion. These properties are well known due to the seminal works of my late mentors Donald W. Pritchard in the Chesapeake Bay and elsewhere, and Joel W. Hedgpeth in Texas and on the West Coast. Following on this intellectual training and experience I have been further honored to work for over two decades with my colleague Michael A. Rozengurt, on the science, politics and eventual historic demise of the San Francisco Bay-Delta ecosystem. This result was clear to us from the beginning in the 1980's, but it is most noteworthy that none of the many publications resulting from this work are ever cited in more recent Bay-Delta System reports.

Even that late, great U.C. Berkeley hydrologist, Luna Leopold took the time to peer review Rozengurt's findings of flow statistics, and came to the conclusion (in his 6-pg letter) that "Rozengurt was right," and that his basic findings were soundly supported by his detailed statistical data analysis. Luna Leopold was a distinguished member of the National Academy and a member of revered scientific lineage. And, yet, nowhere has EPA or the SWRCB seen fit to use his findings in their quest to set standards that might reverse the obvious degradation still ongoing in the Delta. Leopold's findings were transmitted to the SWRCB by the USF Tiburon Center for Environmental Studies on Oct 6, 1987 following a July 13, 1987 presentation by Rozengurt, Hertz, and Feld of their 1987 Tiburon Report's findings (see below) at the SWRCB D1415 hearings on the Delta. Leopold's own analyses basically agreed with the major finding of the Tiburon study: "First, that the role of fresh water is of highest importance in controlling salinity and the functioning of the "nutrient trap...." Second the Tiburon Report shows that the use of an unsatisfactory data set to describe the available water has in the planning and construction stages seriously underestimated the probability of critical dry conditions in the estuary.... Third, the report shows what should be an obvious fact, that continued diversion of the same magnitude of water in dry years as well as in wet years makes a much larger percentage change in available water in a dry period as in a wet.... Fourth, the amount of water diverted has continued to increase with time despite the data on biological conditions and salinity that have given ample notice that even the present amount of diversion is impacting the ecosystem." Here is a transcendent hydrologist/internationally acclaimed river expert, Leopold, reflecting over 25 years ago on the similarities between myopic water exploitation planning on the Volga, Don and Sacramento and other great rivers and the impact on their estuaries. Clearly, our overoptimistic hydrology and ignorance of estuarine function has brought us to the brink today, in which almost any additional stressor can bring disaster.

First, we must restore the water and salt balance that is the essence of an estuary. Rozengurt was right about this too, and has proposed a physical structure – a restraining channel – that can be used to restore a smaller but more functional estuarine realm

Sincerely, Irwin Haydock Ph.D.

cc: Michael Rozengurt, PhD.,  
cc: Delta Stewardship Council, Attn: Phil Isenberg

REFERENCES: Rozengurt, et. al., 1971 – 2003.

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# PUBLIC SUBMISSION

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| <b>As of:</b> April 27, 2011        |
| <b>Received:</b> April 22, 2011     |
| <b>Status:</b> Posted               |
| <b>Posted:</b> April 26, 2011       |
| <b>Tracking No.</b> 80c35f05        |
| <b>Comments Due:</b> April 25, 2011 |
| <b>Submission Type:</b> Web         |

**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0048

Comment on FR Doc # 2011-03861

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## Submitter Information

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### General Comment

The EPA should step in and research on why the aquatic life is being affected in the San Francisco Bay area. With species disappearing in the Bay it is crucial to find what is causing the deaths or migrations of these species. EPA must take action and has the duty to do so to find out why. It needs to find if it is something in nature causing this or if it is manmade. If there are measures that they need to implement, to help regain these species or stop any further species from disappearing, then that is what needs to be done. According to the law, with action in executive orders have been taken then this needs to be looked at seriously, to maintain the eco system of the San Francisco Bay aquatic life.

# PUBLIC SUBMISSION

**As of:** May 06, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0055

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Thomas J Cordano

**Organization:** Personal comment

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## General Comment

See attached File

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## Attachments

**EPA-R09-OW-2010-0976-0055.1:** TJCordano Letter

2/27/2011

Thomas J. Cordano  
967 El Dorado Way  
Sacramento, CA. 95819  
T\_Bellow@surewest.net

Erin Foresman  
U.S. EPA  
75 Hawthorne St.  
San Francisco, CA. 94105

**Re: Column of Jared Blumenfeld  
Sacramento Bee 2/16/11**

**Dear Ms. Foresman:**

**As a Northern Californian I can't deny that the pollution in the delta came from our third of the state, since the Sacramento River don't flow through So. Cal. or the San Joaquin Valley. Unfortunately, it don't flow past Rio Vista anymore either, with the Lion's share make a hard left turn at Walnut Grove, on its way to places it never went until about 45 years ago. In the summer the Delta is basically stagnant. Toxins drift in, but don't check out. There is not enough current to push them out, so they pile up until they reach that critical mass that kills.**

**So when making your determination as to who's at fault, you may want to make 2 measurements. First, obviously the current levels of the various Delta pollutants. The second, requiring a degree of estimation no doubt: what would the levels of the various pollutants be without the diversion to the Tracy Pumps. The second is what Northern California should pay for. The rest by those benefiting from the diversion.**

**The Sacramento River has been in worse shape before: that is, 19th Century Placer mining. Not just more sediment gumming up the works, but fish killing industrial chemicals, mercury and cyanide used to extract gold from rock. No doubt fish populations took a beating, although I doubt if official surveys were available then, as now. Some bay area shrimping operations were put out of business by it. And when Placer mining stopped the fish populations boomed, at least compared to what they are today. Could it be that the recovery was due to the lion's share of the grit and toxins being flushed all the way out the Golden Gate.**

**Please don't be sidetracked by arguments pitting one species against another. True Stripers eat small salmon. They always have, and before the diversion, there were several times more salmon swimming with several times more Stripers. Steelhead, shad, you name it; all were more plentiful before the pumps were turned on at Tracy. It was about that time that fisherman started getting globs of green moss on their lines with every outgoing tide.**

Yours Truly



# PUBLIC SUBMISSION

**As of:** May 06, 2011  
**Received:** May 06, 2011  
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**Posted:** May 06, 2011  
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**Comments Due:** April 25, 2011  
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**Docket:** EPA-R09-OW-2010-0976

Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0056

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Robert Stanley

**Organization:** Personal comment

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## General Comment

see attached file

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## Attachments

**EPA-R09-OW-2010-0976-0056.1:** RobertStanley Comments

TO ERIN FORESMAN I figured out The number one stress-er to the Delta that no one else seems to realize or to take into account!!! I'm an environmental and engineering consultant. I have the answers you need to fix the Delta. And all kinds of problems. But I want to be paid fairly for my brilliant new technological advancements , and solutions. I am the MAN with the answers that you need!!! Putting a pipeline under the Delta is flawed science. there is a better way. The Delta has little chance of recovery unless you know the NUMBER ONE STRESS-ER.

I enclosed some other letters you should read and get to the proper authority's for consideration. THANKS ROBERT

STANLEY **3156 esplanade #204 chico California 95973 530-894-1712**

**From:** robert stanley (robertstanley@att.net)  
**To:** bhubbard@usbr.gov;  
**Date:** Thu, January 27, 2011 10:27:07 PM  
**Cc:** frances.mizuno@sldmwa.org;  
**Subject:** [ No Subject ]

The place to get water from is way north, Oregon , Washington , Canada all you need to do is pipe it to the northern Sacramento tributary's. The time to build is now. I'm completely against your flawed plan. Do it right, and get a 500 year supply now. I have brilliant new designs to save millions in pumping costs, you really should hire me as a consultant. I know how to fix the delta, which means you can pump more water! I have new storage and flood control system's that you need. The Sacramento sewage treatment plant needs to be fixed in one year not ten!!! This needs federal money NOW!!! I have the best solutions for scores problems. YOU have the money, I have the answers. Sincerely ROBERT STANLEY.

**From:** robert stanley (robertstanley@att.net)  
**To:** bhubbard@usbr.gov;  
**Date:** Mon, February 7, 2011 10:40:40 PM  
**Cc:**  
**Subject:** [ No Subject ]

One way to provide more flood protection for Sacramento would be to divert water from folsom dam over to the Cosumnes River. It would be pretty easy actually straight south from folsom lake . Another free million dollar Idea. You really should hire me as a consultant! But I have several other ones also. I know how to fix the Delta to make it hold more water , provide flood protection ,store more water , and save the fish. ROBERT STANLEY

**From:** robert stanley (robertstanley@att.net)  
**To:** bhubbard@usbr.gov;  
**Date:** Sat, January 22, 2011 1:50:23 PM  
**Cc:** frances.mizuno@sldmwa.org;  
**Subject:** Water transfer's

The first and foremost rule is THE ECONOMY IS NEVER MORE IMPORTANT THAN THE ENVIRONMENT !!! AND THERE IS ONLY ONE ENVIRONMENT AND ONCE IT'S GONE IT'S GONE!!! AND WE GO WITH IT!!! This water transfer is bad science, but since some one high up in the GOV wants it , they will hire scientist's who are willing to sell their soul for money in order to write a false EIS/EIR reports to make it all happen. There is only so much water, but there are far better way's to manage water movement and storage in a seasonal desert. A great info source is the NATIONAL GEOGRAPHIC SPECIAL EDITION ON WATER!!! In it they describe water use and consumption for certain crops and other uses. It makes it obvious that high water consumption crop's like cotton should not be allowed in this state, and because they also use the most pesticides that kill the fish. LIMITING other high water user's like dairy's and cattle ranches may be needed because of the methane they produce, or require them to capture most of it. DRIP irrigation could save thousands. Your bad science means the person with the deepest well gets to deprive their neighbor's of their water rights's I have the answers you need.

Sincerely ROBERT STANLEY

**From:** robert stanley (robertestanley@att.net)  
**To:** bhubbard@usbr.gov;  
**Date:** Sun, January 16, 2011 8:22:28 PM  
**Cc:** frances.mizuno@sldmwa.org;  
**Subject:** Energy saving's

I'm a self taught engineer-consultant who has been studying the Hydrology in the north state for 20 years, I have come up with a new way to save million's in energy cost's. And add to the water supply, add needed water storage, improve delta health, and add flood protection. Under current polices the delta is doomed to fail to sea intrusion within 30 or 50 years from an earth quake. I have the answers you need, to deliver a reliable water supply at greatly reduced cost's MY IDEA"S are PRICELESS. EACH of my 5 engineering solutions should be worth a million each!!! The energy savings alone will pay for my consultant's fee in a very short time. Make reasonable offer \$ for my study's !

Sincerely Robert Stanley

**From:** robert stanley (robertestanley@att.net)  
**To:** Horizonsupport@oegllc.com;  
**Date:** Tue, May 4, 2010 1:40:14 PM  
**Cc:**  
**Subject:** [ No Subject ]

To Horizon support After seeing news reports of the old faulty boom designs, I have come up with a million Dollar Idea on how to make a new one that should be much more effective in light to medium winds and small waves and slightly choppy seas !!! time is short !! Call BP This is worth bucks! Make offer !

**From:** robert stanley (robertestanley@att.net)  
**To:** Horizonsupport@oegllc.com;  
**Date:** Wed, May 12, 2010 10:18:56 AM  
**Cc:**  
**Subject:** [ No Subject ]

I have a brilliant new surface oil boom containment and collection system!!! I just want a million\$ consulting fee!! It's worth more because of the billions in damage it could help prevent!!! It's 90% better than what you have and are using!!! Several states should buy my ideas!!! TIME IS SHORT!!! BP should pay me!!! I don' have a patent so maybe homeland security could fast track one for me or buy my collection of IDEAS!! OR maybe the Bill Gates foundation could pay me!! MAYBE I should ask 5 million!! ROBERT STANLEY  
530 894 1712

**From:** robert stanley (robertstanley@att.net)  
**To:** Horizonsupport@oegllc.com;  
**Date:** Thu, May 27, 2010 2:41:15 PM  
**Cc:**  
**Subject:** Re: Horizon Call Center

I have the best answers for wetland protection!!!! BRILLIANT NEW IDEAS DESIGNS,AND TECHNOLOGICAL ADVANCEMENTS!!!! I keep my ideas in my head because there too valuable. I want 5 mil after taxes! Now since you have been in touch with me for a month, while at the same time allowing wetland destruction, That could be criminal!!

---

**From:** Horizon Support <Horizonsupport@oegllc.com>  
**To:** robertstanley@att.net  
**Sent:** Wed, May 26, 2010 11:48:18 AM  
**Subject:** Horizon Call Center

Robert Stanley,

Thank you for your inquiry. We appreciate your concern and willingness to help. Note, once we receive your information, you will be in our database, you do not need to call again.

Thank you!

The Horizon Support Team

**From:** robert stanley (robertstanley@att.net)  
**To:** Horizonsupport@oegllc.com;  
**Date:** Sun, June 20, 2010 7:10:59 AM  
**Cc:**  
**Subject:** Re: Horizon Call Center

You know sometimes you need someone that can think out side the box. I came up with brilliant engineering solutions to keep oil contained and off the beach a week after the rig failure. My father is an engineer and a retired Air Force Officer, COL Ken Stanley. I had the highest mathematical aptitude in my high school class. I'm shocked at the pathetic lack of solutions your dream team has come up with!!! I have the answers you desperately need!!! IT seems so simple to me and I'm sure in time you will reach the solutions I've had for weeks!!! I feel like I'm committing treason by with holding this vital information!!! but I want and deserve to be payed handsomely!! At first I only wanted a million but I spoke with someone from BP who said my ideas would be worth 10 million if I could prevent a billion in losses!!! You career people don't think I deserve it but I do because I have the hard answers you need now!!! I've had several epithet's!!!! With my collection of ideas deepwater drilling could resume!!! They are that good!!! I have the new standards the MMS needs. That oil is going to move!!! I have 4 or 5 missing pieces of the puzzle you need!!  
Sincerely ROBERT.

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**From:** Horizon Support <Horizonsupport@oegllc.com>  
**To:** robertstanley@att.net  
**Sent:** Wed, May 26, 2010 11:48:18 AM  
**Subject:** Horizon Call Center

Robert Stanley,

Thank you for your inquiry. We appreciate your concern and willingness to help. Note, once we receive your information, you will be in our database, you do not need to call again.

Thank you!

The Horizon Support Team

**From:** robert stanley (robertestanley@att.net)  
**To:** Horizonsupport@oegllc.com;  
**Date:** Fri, July 16, 2010 9:20:29 AM  
**Cc:**  
**Subject:** Re: Horizon Call Center

I'm going to expose the truth that you ignorent fools bypassed the best wet land protection system available and the best coastal protection system!!!! Billions could have been saved!!!!

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**From:** Horizon Support <Horizonsupport@oegllc.com>  
**To:** robertestanley@att.net  
**Sent:** Wed, May 26, 2010 11:48:18 AM  
**Subject:** Horizon Call Center

Robert Stanley,

Thank you for your inquiry. We appreciate your concern and willingness to help. Note, once we receive your information, you will be in our database, you do not need to call again.

Thank you!

The Horizon Support Team

**From:** robert stanley (robertstanley@att.net)  
**To:** www.dbaker@sfchronicle.com;  
**Date:** Thu, July 22, 2010 10:01:28 PM  
**Cc:**  
**Subject:** [ No Subject ]

To Producers I have had a brilliant new wet land protection system that I have been trying to sell to BP,MMS,COAST GUARD,Dept of Interior,Louisiana EPA, Florida,Horizon support, Since week one !!!!!!!!!!! During week 2 , I redesigned my system too withstand wind and medium size waves, I try ed to design it too with stand a tropical storm !!! I also designed an in sea containment system , and a new skimmer design !!! , the skimmer will take time to build but the first two could have saved billions in damage !!! I FIGURED OUT THE MISSING PIECES OF THE PUZZLE ,and at first only wanted one million. But after talking to some one from BP I ASKED ( if my solution can save a billion in damage isn't my IDEAS WORTH 10 million and she said yes ) So I figure that's a fair price , my IDEAS are THAT GOOD and should become the new standards the MMS needs to resume deep water DRILLING !!! BUT ALL I RUN INTO IS RED TAPE , because I don't have them patented, so I won't reveal the answers until I GET PAID !!! I even E-mail THE PRESIDENT , but I don't think they took me seriously because I misspelled ENVIRONMENT ! I couldn't find spell check on the PRESIDENTIAL form letter. IT'S HARD WATCHING THE PATHETIC EFFORTS THEY ARE MAKING PROTECTING THE COAST WHEN I HAVE ANSWERS THAT ARE 1000 PERCENT BETTER AND COULD HAVE WITHSTOOD THAT LAST STORMS EFFECTS !!! THIER STUFF GOT BLOWN AWAY AND THIER FLEET GROUNDED !!! TWO YEARS AGO I BODYBOARDED 16ft PIPELINE AND 20ft SUNSET SO I KNOW THE POWER OF THE OCEAN !!! I LIVED IN THE ISLANDS FOR FIVE YEARS. ROBERT STANLEY 530-894-1712 I'm thinking of writeing a book on BP and the COAST GUARD AND EVERONE I CALLED AND THIER FAILURE TO PROTECT THE COAST !!!

# PUBLIC SUBMISSION

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**Posted:** May 19, 2011  
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Water Quality Issues in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Comment On:** EPA-R09-OW-2010-0976-0001

Water Quality Challenges in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Document:** EPA-R09-OW-2010-0976-0059

Comment on FR Doc # 2011-03861

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## Submitter Information

**Submitter's Representative:** Jim Bell

**Organization:** individual

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## General Comment

see attached file

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## Attachments

**EPA-R09-OW-2010-0976-0059.1:** Jim Bell Comment Letter

*Following the strategy below will guarantee us better water supply for all practical purposes, forever.*

## **When Good is Bad**

By Jim Bell

[www.jimbell.com](http://www.jimbell.com) [jimbellel@cox.net](mailto:jimbellel@cox.net)

619-758-9020

Here we go again, justifying doing something bad to do something supposedly good.

I'm referring to the plan to scrape off hundreds of square miles of desert and other habitat areas to install solar collecting devices that convert direct solar light into electricity. This approach will also require that more plant and animal habitats will have to be damaged to construct and maintain transmission lines to deliver electricity produced by remote solar power plants to cities where most of it is needed.

Obviously, scraping off land to install renewable energy to electricity producing devices will hurt all the plants and animals on the land to be scraped off. It will also hurt animals that now use the land to be scraped off for food, water and migration. But don't we have to have remote solar to electricity sites to become renewably electricity self-sufficient in urban areas?

**Absolutely not!!!**

In fact, much of the United States can become renewable electricity self-sufficient, and do it in ways that are both cost-effective and life-support-system-effective. Because of laws like AB 117 (CCA or Community Choice Aggregation) in California, this option is already available to cities and counties in some states. Basically it allows cities and counties in those states to become CCA municipalities. This means that cities and counties in those states can choose to become electricity supply and price secure by making their buildings and infrastructure more electricity use efficient and by installing PV panels on roofs and over parking lots.

Assuming 1,000 sq. ft. of roof and parking lot per capita, San Diego County, where I live, can use free-market forces to cost-effectively become renewably electricity self-sufficient. This can be accomplished by increasing the County's electricity use efficiency by 40% and installing 15% efficient PV panels over 17% its roofs and parking lots, (shaded parking).

Other benefits of becoming renewable electricity self-sufficient include:

+ Eliminating the need to scrape off habitat to accommodate remote direct solar installations and transmission lines to deliver the electricity they produce to urban areas. Land under buildings and parking is already disturbed and damaged plant and animal habitat. Installing efficiency

improvements in building and PV panels on roofs and over parking lots eliminates the need to impact new land.

+ Being more electricity supply and price secure. The increase in electricity use efficiency and the electricity produced on local roofs and parking lots cannot be cut off by the failure of transmission lines from remote suppliers to urban areas. Increasing electricity use efficiency and installing PV panels on roofs and over parking lots would also make it difficult for acts of nature, accidents or intentional human acts to cause serious damage or disruption to a county's production, distribution and storage of renewably generated electricity.

+ Changing San Diego County's negative-electricity purchase cash-flow into a positive-electricity-purchase-cash-flow. Currently San Diego County exports one billion plus dollars each year to purchase imported electricity or imported natural gas or nuclear fuel to make electricity locally. If the County were renewable electricity self-sufficient today, all the money now exported to pay for imported electricity or fuels to produce it locally will be kept in the County's economy. Initially this money will be used to hire businesses and its employees to make the county more electricity use efficient and install PV panels on roofs and over parking lots. Because the businesses and workers making the county more electricity use efficient and renewable electricity self-sufficient will be local, much of the money they earn will be spent locally, helping everyone's bottom line. Assuming an economic multiplier benefit of two, a renewable electricity self-sufficient San Diego County would add around \$3 billion of economic activity to the County's economy each year. This is assuming that electricity is 10 cents per kWh. If the cost of electricity on the Western States Electricity Grid Market is more than 10 cents per kWh, the positive-cash-flow and economic multiplier benefit of becoming renewable electricity self-sufficient in San Diego County will grow accordingly.

+ That local efficiency and PV installations do not require new power lines or existing power line enhancement. The electricity produced with PV on roofs and over parking lots is already grid connected. Excess electricity produced during peak PV output can be sold or traded for electricity through out the Western States Electricity Grid for times when local PV panels are not producing sufficient electricity to meet the county's electricity demand.

+ Eliminating the County's contribution to pollution, general life-support damage and to climate change related to its dependence on producing electricity using fossil and nuclear fuels. It also eliminates the life-support damage connected to producing and delivering remotely produced renewably generated electricity to urban areas.

**+ Eliminating price shocks related to the rising cost of electricity; made with price uncertain non-renewable energy resources.** Unlike fossil and nuclear fuels, renewable energy resources are free and even delivered free. We are still becoming more cost-effective at becoming more electricity use efficient and making and installing PV panels over roofs and parking lots.

**+ Increasing local business and employment.** Becoming renewable electricity self-sufficient in San Diego County will create over 400,000 job-years of direct and indirect employment.

**+ Changing ratepayers into utility company owners.** As owners, ratepayers can meet all their electricity needs. If they produce more than they need, they can sell excess production into the Western States Grid.

**+ Fostering the potential for the cost of increasing electricity use efficiency and renewably generated electricity to become less expensive.** The manufacture and installation of electricity use efficiency measures and renewable energy collection and conversion to electricity devices is still becoming less expensive and the energy to power them is free and even delivered free.

**+ Serving as a free-market example of how communities, in general, can save money and the environment by becoming renewable electricity self-sufficient.** With some modifications, this investment strategy can be used by many communities to become completely renewable energy, water and food self-sufficient.

**+ Becoming more electricity use efficient and installing PV panels on roofs and over parking lots adds zero heat to the county's incident solar load.** When electricity produced in the desert is used locally, it will add heat from the desert to the county's incident solar load. It's a small addition but now is not the time we need more heat.

For details on the free-market plan (zero subsidies needed) to make San Diego County renewable electricity self-sufficient, go to [www.jimbell.com](http://www.jimbell.com) and click on "Green Papers"