



**From:** Leahigh, John@DWR John.Leahigh@water.ca.gov

**Subject:** RE: WQ & WL forecast for July 12-August 1

**Date:** September 13, 2016 at 9:20 PM

**To:** Herrick, John @aol.com jherrlaw@aol.com, Shahcheraghi, Reza@DWR Reza.Shahcheraghi@water.ca.gov, Pettit, Tracy@DWR Tracy.Pettit@water.ca.gov, Glasgow, Andrea@DWR Andrea.Glasgow@water.ca.gov, Cheng, Grace@DWR Grace.Cheng@water.ca.gov, lorloff@ccwater.com, Ishih@ccwater.com, Chu, Andy@DWR Andy.Chu@water.ca.gov, mmoses@ccwater.com, Mendoza, Paul@DWR Paul.Mendoza@water.ca.gov, Christen, Joe (CDPH-DDWEM-EMB) Joe.Christen@cdph.ca.gov, Grober, Les@Waterboards Les.Grober@waterboards.ca.gov, Fernandez, Patricia@Waterboards Patricia.Fernandez@waterboards.ca.gov, McQuirk, Jacob@DWR Jacob.McQuirk@water.ca.gov, Hinojosa, Tracy@DWR Tracy.Hinojosa@water.ca.gov, Giorgi, Bryant@DWR Bryant.Giorgi@water.ca.gov, Herrick, John @aol.com jherrlaw@aol.com, Yamanaka, Dan@DWR Dan.Yamanaka@water.ca.gov, Crothers, Cathy@DWR Cathy.Crothers@water.ca.gov, George, Michael@Waterboards Michael.George@Waterboards.ca.gov, Collins, John@Waterboards John.Collins@waterboards.ca.gov, Rico, Christine@Waterboards Christine.Rico@waterboards.ca.gov, Abioui, Michael@DWR Michael.Abioui@water.ca.gov, Wong, Michelle@DWR Michelle.Wong@water.ca.gov

**Cc:** Herrick, John @aol.com jherrlaw@aol.com, ngmplcs@pacbell.net, dean@hprlaw.net, RMILLIGAN@usbr.gov, Rieker, Jeffrey@USBR jrieker@usbr.gov, ekiteck@usbr.gov, Ford, John@DWR John.Ford2@water.ca.gov, Holderman, Mark@DWR Mark.Holderman@water.ca.gov, Sergeant, Maureen@DWR Maureen.Sergeant@water.ca.gov, Leahigh, John@DWR John.Leahigh@water.ca.gov

Mr. Herrick (John),

I am following up on the points raised in your August 26 email regarding salinity modeling conducted for water transfers this July through September. You raised these issues among the group of agencies who typically receive DWR's modeling analysis for effects of water transfers.

In my August 31 email (below) I responded to your two technical questions regarding model accuracy. I explained that salinity in the south delta channels was observed to increase due to localized salinity discharges; and also that we found an error in the input data to the model. The error in modeling was corrected the week of July 22 and the subsequent forecasts show no discernable difference in EC for the with and without modeling of salinity during the transfers.

Thanks, John

**John W. Leahigh, P.E.**  
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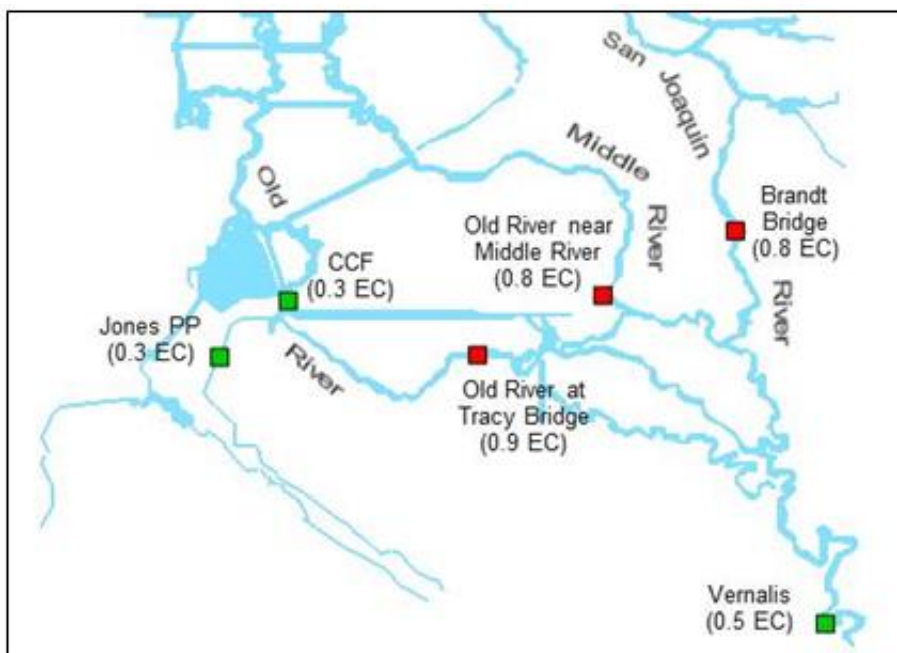
**From:** Leahigh, John@DWR  
**Sent:** Wednesday, August 31, 2016 5:42 PM

**To:** Herrick, John @aol.com; Shahcheraghi, Reza@DWR; Pettit, Tracy@DWR; Glasgow, Andrea@DWR; Cheng, Grace@DWR; lorloff@ccwater.com; Ishih@ccwater.com; Chu, Andy@DWR; mmoses@ccwater.com; Mendoza, Paul@DWR; Christen, Joe (CDPH-DDWEM-EMB); Grober, Les@Waterboards; Fernandez, Patricia@Waterboards; McQuirk, Jacob@DWR; Hinojosa, Tracy@DWR; Giorgi, Bryant@DWR; Herrick, John @aol.com; Yamanaka, Dan@DWR; Crothers, Cathy@DWR; George, Michael@Waterboards; Collins, John@Waterboards; Rico, Christine@Waterboards; Abioui, Michael@DWR; Wong, Michelle@DWR  
**Cc:** Herrick, John @aol.com; ngmplcs@pacbell.net; dean@hpplaw.net; RMILLIGAN@usbr.gov; jrieker@usbr.gov; ekiteck@usbr.gov; Ford, John@DWR; Holderman, Mark@DWR; Leahigh, John@DWR  
**Subject:** RE: WQ & WL forecast for July 12-August 1

Mr. Herrick (John),

Here are the initial thoughts from the Department in response to the first couple of points contained in your email from Friday, August 26. (Reclamation does not appear to be one of the recipients to your original email so I have cc them on this response.)

The first is an issue related to the accuracy of the model as it relates to forecasting EC at the Old River and Middle River compliance locations. In your email you touched on the issue that presents the greatest challenge to the current modeling in these channels, which is the previously identified localized high salinity discharges from Sugar Cut, Paradise Cut, (and possibly other sources). Although this localized effect appears to affect all of the south Delta locations it is certainly most pronounced at the Old River near Tracy Road Bridge location. This localized degradation, which is not picked up well by the model, is quite clear when comparing the EC measurements both upstream (east) and downstream (west) of the south Delta channels. In our August 21 report of exceedances at Brandt Bridge and Middle River stations we provided the map of the area. At that time the salinity readings at Vernalis were 0.5 EC and salinity readings at CCF and Jones PP were both 0.3 EC. Yet EC in the south Delta channel locations was exceeding 0.7 EC.



The second issue that you raised was the larger than expected change in forecasted salinity at Middle River and Tracy Road Bridge from a minor increases in Project pumping levels associated with planned water transfers. Members of the CWF modeling panel did indeed observe that the results of that model forecast were unreasonable and possibly inaccurate. After further review of the modeling that was emailed out on July 8 and July 15 it was discovered that there was an error in the input data to the model. The EC input for San Joaquin River at Vernalis was inconsistent between the “base case” and “without transfer” cases. This error was corrected in all subsequent forecasts beginning the following week, July 22. The subsequent forecasts show no discernable difference in EC for the two cases.

As far as your final point we will need additional time to thoroughly consider the appropriate response.

Thanks, John

**John W. Leahigh, P.E.**  
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**From:** [Jherrlaw@aol.com](mailto:Jherrlaw@aol.com) [<mailto:Jherrlaw@aol.com>]

**Sent:** Friday, August 26, 2016 9:10 AM

**To:** Shahcheraghi, Reza@DWR; Pettit, Tracy@DWR; Leahigh, John@DWR; Glasgow, Andrea@DWR; Cheng, Grace@DWR; [lorloff@ccwater.com](mailto:lorloff@ccwater.com); [lshih@ccwater.com](mailto:lshih@ccwater.com); Chu, Andy@DWR; [mmoses@ccwater.com](mailto:mmoses@ccwater.com); Mendoza, Paul@DWR; Christen, Joe (CDPH-DDWEM); Grober, Les@Waterboards; Fernandez, Patricia@Waterboards; McQuirk, Jacob@DWR; Hinojosa, Tracy@DWR; Giorgi, Bryant@DWR; Herrick, John @aol.com; Yamanaka, Dan@DWR; Crothers, Cathy@DWR; George, Michael@Waterboards; Collins, John@Waterboards; Rico, Christine@Waterboards; Abioui, Michael@DWR; Wong, Michelle@DWR

**Cc:** Herrick, John @aol.com; [ngmplcs@pacbell.net](mailto:ngmplcs@pacbell.net); [dean@hpplaw.net](mailto:dean@hpplaw.net)

**Subject:** Re: WQ & WL forecast for July 12-August 1

DWR and USBR:

Your update of July 15, 2016 regarding transfers included four charts of modeled impacts of the with transfer and without transfer scenarios. The chart for the location of Old River near Middle River forecasted that EC without the transfer would be between 500 and 680 (estimate) EC while the with transfer would be about 480-550 (estimates) EC. Two things are relevant. Of course modeling is only modeling and not meant to be perfectly accurate. However, the EC during the time of those modeled EC's set forth above was 790- 830 EC (which is above the standard and not in an area DWR claims is adversely affected by Sugar Cut or Paradise Cut flows). I do not believe it is useful to be presenting us with information about the effects of transfers that is so substantially different than reality. The impacts between a water quality of 480 EC and one of 830 EC need not be explored at this time; suffice to say such significant changes in EC can easily be the difference between compliance and violation.

Second, the modelers put on by USBR and DWR for the ongoing WaterFix hearings testified under oath over the last few days that the 100+ EC change between the two scenarios modeled for the transfers did not appear to be reasonable or accurate (my words not their exact words). It is indeed difficult to imagine how an additional 350 cfs of exports (from the transfer water) could result in a 100

EC change at Old River near Middle River. Something needs to be re-examined or explained. I understood the transfer water was from the Sacramento side which underlies my questioning of the impacts. The San Joaquin River flow at this time was about 260 cfs so I do not see how the transfer water could come from that system.

I also note that the plots on the graph are "Base Case" and "Without Transfer." Please confirm if the plotted lines are as labeled. One would think the base case would be without transfers and the other a "with transfer." This is not just confusing; the results indicate an improvement in water quality with the transfer while the text of the accompanying email notes "insignificant degradation" of water quality with the transfer. Again, this does not seem to add up.

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In a message dated 7/15/2016 5:26:06 P.M. Pacific Daylight Time, [Reza.Shahcheraghi@water.ca.gov](mailto:Reza.Shahcheraghi@water.ca.gov) writes:

The Department of Water Resources and the U.S. Bureau of Reclamation are conducting water transfers which began on July 1, and will continue through September. The daily rate of planned transfer is currently at 350 cfs during July.

The attached files contain forecasted water quality at Holland Tract, Old River near Middle River, San Joaquin River at Brandt Bridge, and Old River at Tracy Road as well as forecasted water levels at the following south Delta locations--Old River west of Union Island near Coney Island, Middle River at Howard Road, Old River at Tracy Road, Doughty Cut, and the head of Grant Line Canal for both the "with" and "without-transfer" cases.

The attached model results cover the period of July 12-August 1, and are based on the following assumptions:

1. CCFB Gates are operating to Priority 3 throughout the forecast period.
2. The Delta Cross Channel gates are open as of June 18, and will remain open throughout the forecast period.

3. Suisun Marsh salinity control floodboards are removed, the three Suisun Marsh Salinity

3. Suisun Marsh Salinity Control Flashboard are removed, the three Suisun Marsh Salinity Control Gates are in open position.
4. The Middle River ag. barrier is installed with all 6 culvert flap-gates operating tidally. The barrier was raised 1 foot June 22.
5. The Old River at Tracy ag. barrier is installed with all 9 culvert flap-gates operating tidally.
6. The Grant Line Canal ag. barrier is fully installed with all 6 culvert flap-gates operating tidally.
7. San Joaquin River flow at Vernalis is at 327 cfs at the beginning of the forecast period and decreases to 300 cfs by the end forecast period.

The model results show minor difference in forecasted water levels between the base case and the without-transfer case at compliance stations. While we are conducting transfers we will monitor water levels at the five south Delta stations listed above. If we are not meeting the requirements of the WLRP, the Projects would not initiate or would cease transfers until water levels improved.

The model results show insignificant degradation in forecasted water quality in the base case as compare to the without-transfer case at Holland Cut station. The 30-day average electrical conductivity (EC) objective for the interior south Delta stations is 0.7 mmhos/cm April through August. South Delta EC is highest at the Old River at Tracy station; the current mean daily and 30-day average EC values are 0.96 mmhos/cm and 0.83 mmhos/cm EC, respectively.

Please contact me if you have any questions or concerns regarding this email/notice.

Sincerely,  
Reza Shahcheraghi

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