

**EXHIBIT WR-211**

**REBUTTAL TESTIMONY OF JEFFREY YEAZELL**

My rebuttal testimony directly addresses certain issues raised by the Written Testimony of Greg Young, P.E. (Exhibit BBID392). Mr. Young made seven (7) conclusions regarding alleged errors in the demand-side of the water availability analysis performed by staff of the State Water Resources Control Board (SWRCB) in 2015 (Exhibit BBID392, ¶15). My rebuttal testimony specifically addresses the following alleged conclusions reached by Mr. Young: (2) “the SWRCB failed to effectively use 2015 water use data submitted to the SWRCB by diverters to adjust its forecasts of water demands” (¶ 27); (3) “the SWRCB included duplicate demands for numerous rights in the Delta, thereby inflating the demand values used to assess water availability for purposes of the curtailment notices and enforcement orders” (¶¶ 28-33); and (7) “general data entry mistakes” (¶¶ 38-42).

I will also address Mr. Young’s first conclusion, namely the correct quantification of demands that can “rightfully” be charged against full natural flow (¶¶ 7-25), but I will address that point at the end of my rebuttal testimony. The other conclusions reached by Mr. Young (conclusions #4-6, as well as conclusion #1) are addressed in the rebuttal statements of Brian Coats and Kathy Mrowka.

**Young Conclusion #2: 2015 Informational Order Data (Exhibit BBID392, ¶27)**

Mr. Young testifies that the Water Board “failed to effectively use 2015 water use data submitted by diverters to adjust its forecasts of water demands” (¶15). Mr. Young is correct that the staff did not use all of the 2015 information in the Water Availability Analyses (WAAs<sup>1</sup>) associated with the May and June Notices of Water Unavailability (Notices). Mr. Young claims he replaced 2014 Information Order data with that from 2015 and that “there were individual increases and decreases in monthly values, but an overall reduction in the total monthly values” (¶27). To evaluate the accuracy and significance of Mr. Young’s claim, I revised the supply/demand plot associated with the June 12, 2015, Notice (Exhibit WR-77) by replacing the reported 2014 Information Order diversions included in the original WAA with the reported 2015 Information Order reported demands. The reconstructed or revised plot using the 2015 Information Order demand data is included as Figure 1.

---

<sup>1</sup> As Brian Coats and Kathy Mrowka explained in their case-in-chief testimony, the drought supply and demand analysis conducted in 2015 is not the same as a “Water Availability Analysis” conducted for water right permitting. I use the term Water Availability Analysis here for convenience.

Appendix A, attached to this testimony, contains a report describing the process I took to update the demand data and construct the plot in Figure 1. To perform this substitution, I used the R programming language (Foundation for Statistical Computing, Vienna, Austria), a free, open-source software environment for statistical computing, data analysis, and graphics. I chose to use R to provide a level of reproducibility that is not as easily accomplished using Excel spreadsheets. R scripts provide a line-by-line story of how the raw data was read, cleaned, manipulated, and analyzed to become the resulting data set. The R script, when applied to the identical raw data, will always produce the same result. I have used R for various statistical and data analysis projects for over ten years. My updated resume is provided as Exhibit WR-212 (true and correct copy) to document recent training I have taken to further enhance my expertise in R programming and data analysis.

A zipped file containing true and correct copies of the R script and data files used to perform the revision are presented as Exhibit WR-239 (true and correct copy). Note that this is not a 'new' analysis. The R script described in Appendix A simply removed the 2014 Information Order diversions and replaced them with the corresponding 2015 Information Order demands in a manner consistent with the original WAA, then constructed the revised supply/demand plot in Figure 1.

Looking at Figure 1, the yellow and orange/tan shaded areas of the plot represent the resulting aggregate Riparian and Pre-1914 demand, respectively. The green and purple points represent the adjusted monthly FNF exceedance forecasts at the 50- and 90-percent levels, respectively. Each point reflects the value for the entire month in which it is centered. The dashed lines connecting these points do not represent any values; they just help the viewer follow the trend of each set of points. The blue line represents the combined ten-station daily FNF flows. The red dashed line represents the cumulative Senior demand through the 1902 priority level, and the red dashed/dotted line represents the cumulative Senior demand through the 1913 priority level. The black vertical dashed line indicates the day on which the Notice was issued (June 12, 2015).

As indicated on Figure 1, the water supply represented by the June adjusted 50-percent Exceedance FNF Forecast (the green point) is well below the June cumulative senior demand through the 1902 priority level (the red dashed line). The difference between the June adjusted 50-percent Exceedance FNF Forecast and the 1913 priority level (the red dashed line) is even greater. BBID's 1914 demand is above the 1913 line. The following flow and demand values are applicable for June:

- Riparian Demand: 5,622 cfs.

- Pre-1914 Demand: 8,150 cfs.
- Combined Riparian and Pre-1914 Demand: 13,771 cfs.
- Senior Demand Through 1902: 11,759 cfs.
- Adjusted 50% Exceedance Forecasted FNF: 8,974 cfs.

From Exhibit WR-77, the June Senior demand through the 1902 priority year was originally calculated to be 13,560 cfs (Cell H119 on the Senior Chart Data tab), which indicates a reduction of 1,801 cfs, or 15 percent by replacing the reported 2014 Information Order demands with the 2015 demands.

With all other parameters in the WAA associated with the June 12, 2015, Notice (Exhibit WR-77) being equal, the combined demands did decrease, but not to the extent that they would have changed staff's recommendations on issuing the Notices when they did.

### **YOUNG CONCLUSION #3: ALLEGED DUPLICATE DEMANDS (EXHIBIT BBID392, ¶¶28-33)**

Mr. Young claimed that he “discovered many instances where multiple statements had the same listed value for the same month,” which he otherwise terms “Duplicate Delta Demands” (¶28). Mr. Young uses six (6) examples of alleged duplicates to support his claim. He stated that he reviewed the Initial Statements of Diversion and Use and provided some justification as to why they were duplicates, but he failed to review the Supplemental Statements<sup>2</sup> in which the diverters explicitly stated they were not duplicates. True and correct copies of the 2012 Supplemental Statements for the six diversions Mr. Young used to illustrate his claim (S020995, S021018, S021024, S021030, S021032, and S021033) are included in Appendix B of this testimony.

As I explained in my initial testimony, I created the WRUDS spreadsheet to flag potential duplicate reporting using the following criteria: 1) the owner name must be identical, and 2) the monthly average demands must be equal in each individual month for all 12 months. In the Delta, the duplicate flagging algorithm identified 196 statements that were potential duplicates that were not subject to the Information Order.<sup>3</sup> Prior to incorporating the 2014 data collected under the information order, all of the demand data were evaluated for potential duplicates using the algorithm. Next, data collected

---

<sup>2</sup> Supplemental Statements of Diversion and Use are available for the public to review at <https://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWPublicTerms.jsp>

<sup>3</sup> Obtained from Tab 3 of Exhibit WR-77 by filtering HYDROLOGIC\_UNIT to “LEGAL DELTA”; WR\_TYPE to “Statement of Div and Use”; INFO\_ORDER column to “Blanks”; and DUP\_FLAG to “Y”; then totaling the the remaining row count in the table.

under the 2014 Information Order were added to the spreadsheet, under the assumption that these demands were true and accurate.

The 196 potential duplicate demands identified by the algorithm represented 8,388 acre-feet (136 cfs) of demand in May, and 11,395 acre-feet (185 cfs) of demand in June.<sup>4</sup> Uncorrected, these demands are negligible when compared to the revised total Senior demands of over 15,000 cfs in May and 13,000 cfs in June, as illustrated on Figure 1.

With respect to the 196 potential duplicates, I reviewed the most recent Supplemental Statements of Diversion and Use (Supplemental Statements) in the eWRIMS online database for the most potentially significant duplicate demands. Of these, I found ten (10) confirmed cases of duplicate reporting by one diverter, representing excess demands of 4,750 acre-feet (77 cfs) in May and 5,977 acre-feet (100 cfs) in June. True and correct copies of the 2012 Supplemental Statements for these 10 claims are included in Appendix C of this testimony. I confirmed these 10 cases of duplicate reporting by the comment in Box 11a of each of the Supplemental Statements: *"The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423."* Given such compelling evidence of obvious duplication, the demands from nine of the ten claims were removed from the demand data set.

To be clear, Mr. Young's six examples of alleged duplicate Delta demands that he claims were inappropriately included in the WAA were potential duplicates that I flagged and reviewed when creating the demand data set. I determined these demands were not in fact duplicates because they all shared a similar statement in Box11a of their Supplemental Statements: *"The point of diversion that is the subject of this report is one of [number varies by report] points of diversion that provided water to an approximate [amount varies by report] acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them."* This was sufficient evidence to consider each of the potential duplicates as unique diversions. A large portion of the other remaining potential duplicates in the Delta had a similar statement in box 11a of their supplemental statements.

---

<sup>4</sup> Obtained from Tab 3 of Exhibit WR-77 by filtering HYDROLOGIC\_UNIT to "LEGAL DELTA"; WR\_TYPE to "Statement of Div and Use"; INFO\_ORDER column to "Blanks"; and DUP\_FLAG to "Y"; then summing AVG\_DEMAND\_MAY and AVG\_DEMAND\_JUN, respectively.

On additional example from Mr. Young of a so-called duplicate merits mention (§32). This is an example of a diverter who failed to submit accurate information in response to the Information Order on time. Staff has to rely on the truth, accuracy, and timeliness of the submissions, and the fact that this diverter amended its response after the submittal deadline is unfortunate. However, a 21 cfs demand reduction is negligible when compared to the revised total Senior demands of over 15,000 cfs in May and 13,000 cfs in June, as illustrated on Figure 1.

Finally, Mr. Young testifies that he lacked the time to evaluate all of the individual filings (§33). So did staff. There are over 13,000 permits, licenses, and statements in the Sacramento/San Joaquin/Delta evaluation area, each of which had information from up to four annual reports or supplemental statements incorporated into the demand data set. Reviewing every filing is an impossibility given the expedited time frames needed to make curtailment decisions. Staff must assume diverters report accurately. However, as explained in my Written Testimony (WR-11), several automatic adjustments were made to reduce potential excessive demands, such as reducing over-reported permit and license demands so they don't exceed the permitted or licensed face values, and where possible, reducing irrigation demands so they more accurately reflect an appropriate crop duty based on reported acreage. As explained above and in my earlier testimony, staff reviewed certain annual statements to make determinations on whether a diversion was a duplicate or not. In no instance was an attempt made to increase demands on a particular diversion, unless specifically reported by the diverter, such as through the Information Order. Mr. Young, on the other hand, inappropriately assumed the "likely misreporting of monthly demands" and applied an arbitrary 5 percent reduction for total delta demand (§33). There is no sound basis for doing so.

#### **YOUNG CONCLUSION #7: ALLEGED DATA ENTRY MISTAKES (EXHIBIT BBID392, §§38-42)**

Mr. Young claims that staff or diverters made data entry errors which when corrected would have reduced the demand data set. His examples relate to quantities of demand that are negligible, and to instances not where staff made data entry errors, but rather where diverters reported use statements may or may not have contained errors. As I have stated previously, the Water Board has to rely on diverters to report their use accurately, truthfully, and on time. Mr. Young, however, makes assumptions that certain diverters' statements were submitted in error. With respect to the two examples he gives in §39, it is possible that the diverter may have made decimal placement errors from one month to the next. With respect to the Water Availability Analysis, each month is considered

independently, and has no effect on any other month. The Prosecution Team's Case-in-Chief focuses on whether WSID and BBID diverted unlawfully or threatened to divert unlawfully beginning in May 2015 and June 2015, respectively. Because the excessive reporting identified by Mr. Young occurred in July, Mr. Young's claim is both unfounded and irrelevant.

Mr. Young pointed out two statements that he claimed resulted in demand errors because of inconsistencies in monthly reported diversions between the years from which the average monthly demands were calculated (¶¶40-41). According to Mr. Young, adjustments to the averages by removing the large values would have reduced May and June demands by 13 cfs. As stated previously, staff relies on data reported by diverters to be true and accurate. Additionally, the demand reduction of 13 cfs suggested by Mr. Young is negligible compared to the over-5,000-cfs (visually estimated from Figure 1) demand that would need to be removed in order to meet the 50-percent exceedance FNF forecast for supply in July. In other words, demand exceeded supply by over 5,000 cfs in June, 2015. As such, it was not necessary for me to confirm Mr. Young's calculations.

**Young Conclusion #1 and Final Conclusion: Reported Overall Demand Reduction:**

As explained in my written testimony, staff was very generous to the diverters when analyzing both the supply and demand data, and otherwise relied on their online reporting data to be truthful and accurate. Mr. Young failed to acknowledge the significant amount of demand removed right off the top of the demand data set by staff applying the gross adjustments to the demand data as described in my initial testimony (Exhibit WR-11). Adjustments were made on a bulk scale to the most justifiable and flagrant over-reporting errors (diversions exceeding face values for Post-1914 appropriative rights and diversions exceeding eight-acre-foot/acre crop duties for senior rights that had a net acreage value listed), power-only diversions, and potential duplicate reporting when developing the demand data set.

For example, using the data in the WRUDS 2015-06-09 tab from Exhibit WR-77, the raw, unadjusted, four-year average total June diversion amount for the Riparian and Pre-1914 claims in the WAA boundary, excluding statements subject to the Information Order, was about 808,000 acre-feet<sup>5</sup> (13,600

---

<sup>5</sup> Determined by filtering the AREA column to include SACRAMENTO, SAN JOAQUIN, and LEGAL DELTA; the WR\_TYPE to "Statement of Div and Use"; the INFO\_ORDER column to "Blanks", then totaling the AV\_DIV\_JUN column.

cfs). The resulting June demand after the bulk adjustments were made was about 139,000 acre-feet<sup>6</sup> (2,350 cfs). This is a demand reduction of over 80 percent!

Nevertheless, it is the conclusion of Mr. Young and Mr. Bonsignore that if staff had modified the demands even further to account for spatial issues associated with where demand can be met with supply and other issues (see Rebuttal Testimony of Brian Coats, Exhibit WR-210), there would have been “no reasonable basis for the SWRCB to conclude that water was unavailable” for WSID and BBID in May and June 2015, respectively. His support for this position is offered in Exhibits BBID273 and BBID285 (¶43 and ¶45). Mr. Young and Mr. Bonsignore are wrong.

The Excel workbook Mr. Young used to create his graphs in Exhibits BBID273 and BBID385 was not initially available to me to review. Of note, on each graph, Mr. Young only plotted the daily Full Natural Flows to the beginning of June. His graphs are misleading because they fail to provide any data on supply after June 7. Therefore, he does not provide any water supply data to compare his revised demands to. Even if Mr. Young and Mr. Bonsignore are correct in their identification and quantification of excess demand, there still wasn't enough water to satisfy WSID's and BBID's demands. To illustrate this, on Figure 2 I superimposed the 50-percent Exceedance FNF forecast used in the WAA of Exhibit WR-77 on Mr. Young's graph on Exhibit BBID285. It clearly indicates there is still not enough supply to satisfy these diverters' demands. Accordingly, all of Mr. Young's testimony is irrelevant.

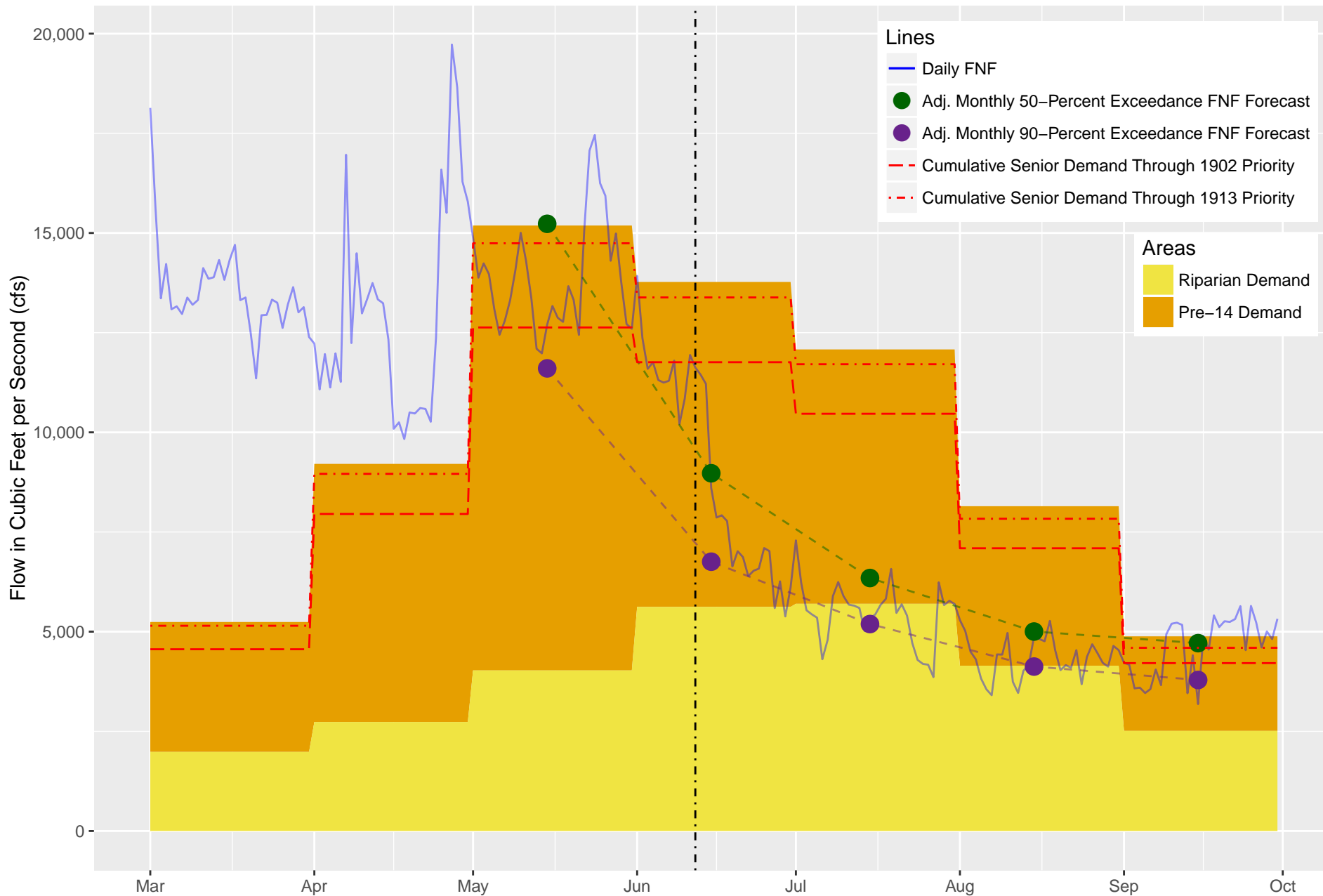
Mr. Young's Excel workbook was ultimately made available to me on February 18, 2016 via BBID's lawyer, Mr. Dan Kelly. A true and correct copy of this workbook as received from Mr. Kelly is presented as Exhibit WR-237. To further exemplify the lack of supply, I added the adjusted 50% Exceedance FNF forecast points from the WAA associated with the June 12 Notice, as well as additional daily FNF data through September, to the workbook Mr. Young used to create the plot in Exhibit 385. A true and correct copy of the workbook with my additions is presented as Exhibit WR-238. The data I added to the plot is located in columns J, K, and L of the 'Modified Senior Demand' tab, and are highlighted in yellow. Figure 3 shows a modified version of Exhibit BBID385 with the FNF Forecast points in red and the additional daily FNF data line in light blue. These additional data again demonstrate there is still not enough supply to satisfy these diverters' demands, and Mr. Young's testimony continues to be irrelevant.

---

<sup>6</sup> Determined by filtering the AREA column to include SACRAMENTO, SAN JOAQUIN, and LEGAL DELTA; the WR\_TYPE to “Statement of Div and Use”; the INFO\_ORDER column to “Blanks”, then totaling the DEMAND\_JUN column.

### Figure 1

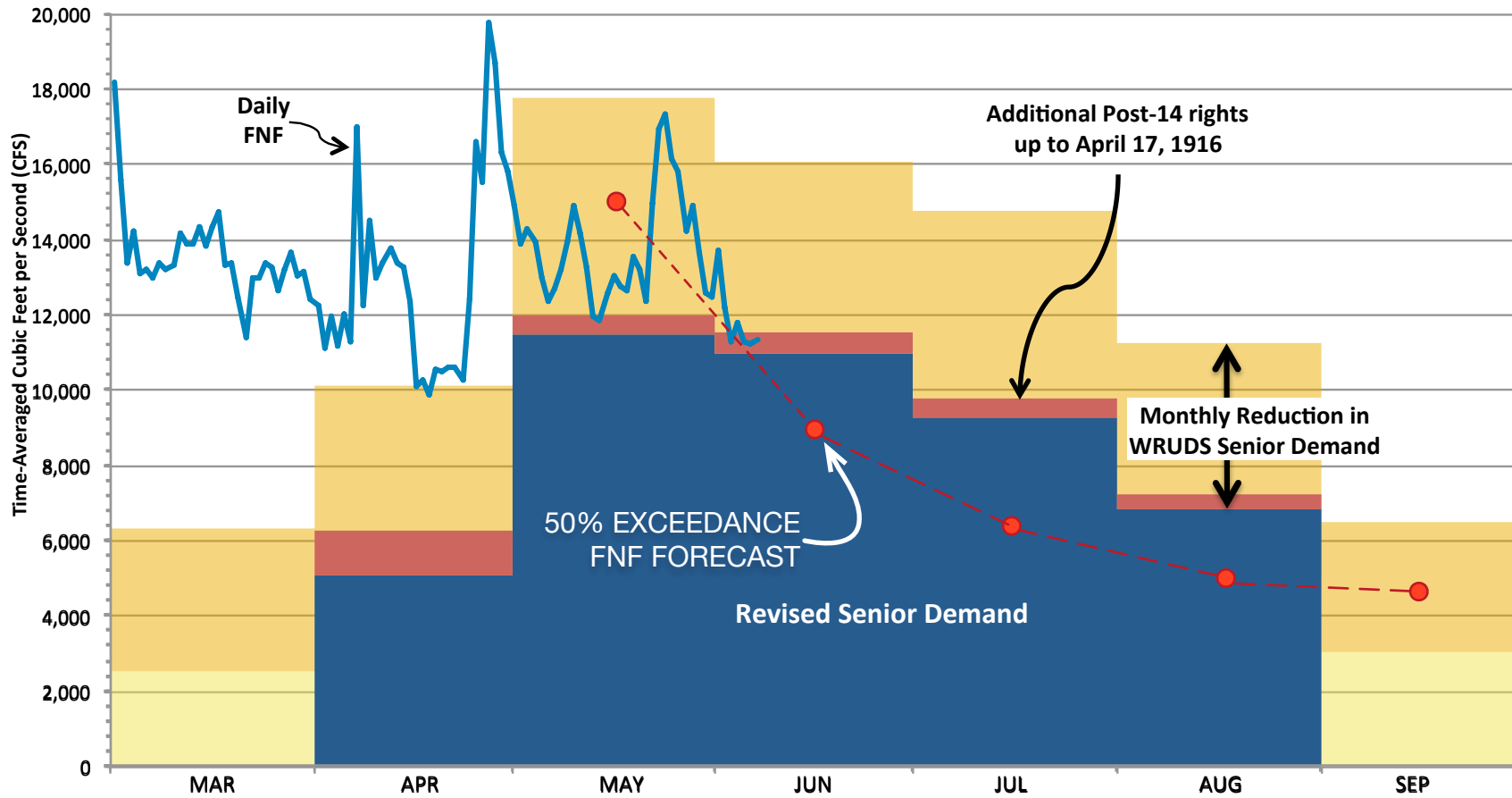
## Revised 2015 Sacramento/San Joaquin Senior Supply/Demand With 2015 Informational Order Demands





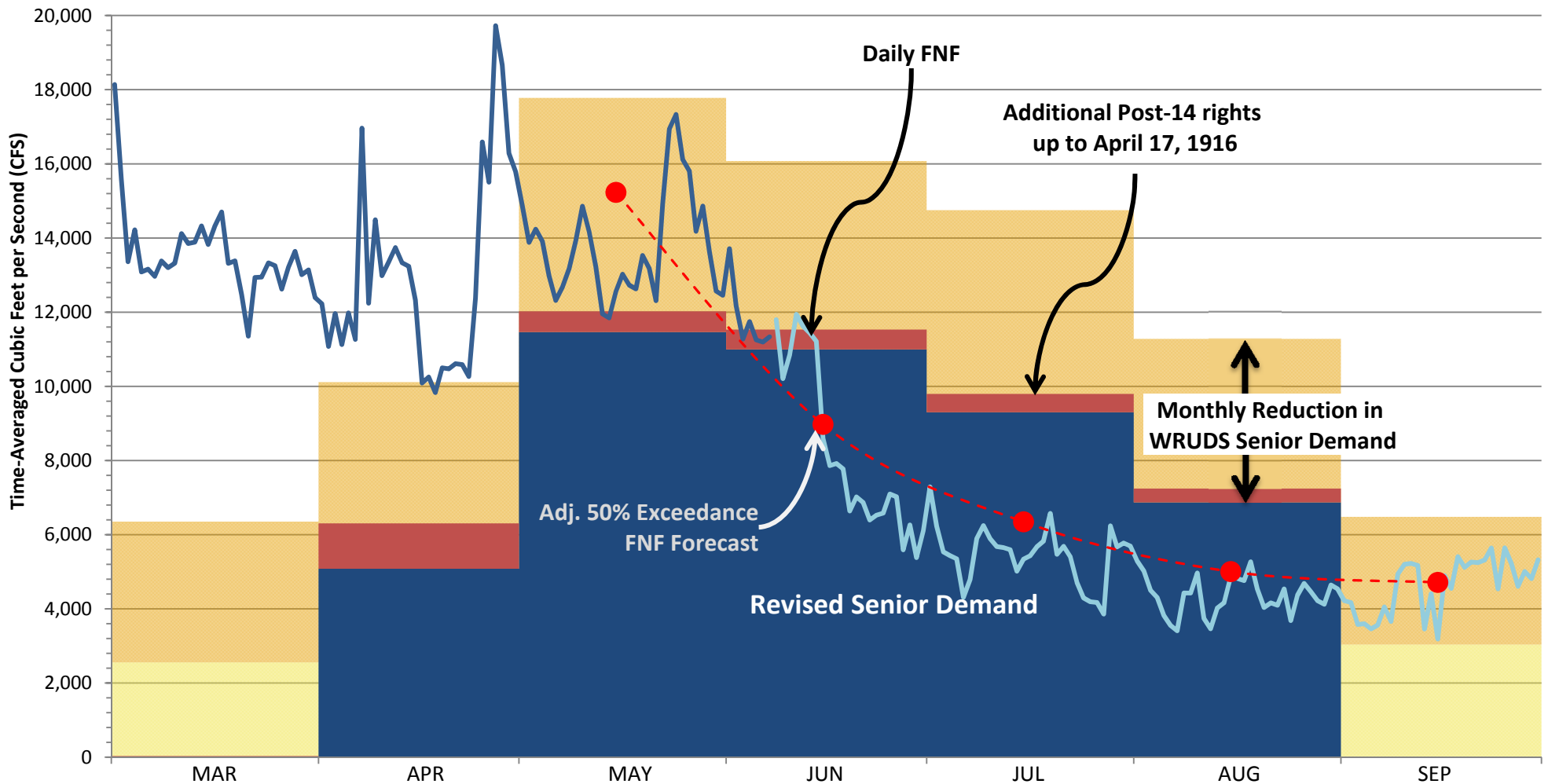
### FIGURE 2

## 50% EXCEEDANCE FNF FORECAST SUPERIMPOSED OVER EXHIBIT BBID-385



**FIGURE 3**  
**Mr. Young's and Mr. Bonsignore's Revised Senior Demands**  
**With Addition of 50% Exceedance FNF Forecasts From Exhibit WR-77**  
**and Extension of Daily FNFs Through September**

**2015 Combined Sacramento/San Joaquin River Basin Senior Supply/Demand**  
**with Revised Senior Demands and Post-14 rights to April 17, 1916**



# Appendix A

## Revised Supply/Demand Plot

### For June 12, 2015, Water Unavailability Notice Incorporating 2015 Information Order Diversions

Jeffrey Yeazell, P.E.  
SWRCB, Division of Water Rights

February 19, 2016

## Summary

I revised the supply/demand plot associated with the June 12, 2015, Notice of Water Unavailability by replacing the monthly 2014 Information Order demands that were used in the original Water Availability Analysis (WAA) associated with the June 12, 2015, Notice of Water Unavailability (Notice) with the monthly 2015 diversions for those statements that had reported. I performed the revisions using R Statistical Software (Foundation for Statistical Computing, Vienna, Austria), a free, open-source software environment for statistical computing, data analysis, and graphics. The R script I created to construct the revised plot is named `WR-77-Revised-Plot.R`, and the raw data files are stored in the Data folder of the zipped project file (Exhibit WR-239). The general sequence of steps taken to revise the plot were as follows:

1. Extract the supply and demand data from the original WAA worksheet and save them as comma-separated-values (CSV) files.
2. Load the original raw demand CSV files and raw 2015 Information Order demand file.

3. Clean and tidy the 2015 Information Order demand data set.
4. Clean and tidy the Sacramento/San Joaquin and Delta data sets.
5. Remove and replace existing 2014 Information Order demands with corresponding 2015 values.
6. Load and tidy original supply data.
7. Combine the above data sets into a single data frame from which to build the supply/demand plot.

The following sections describe the procedures and methods I used to prepare the data, process the data, and build the resulting supply/demand plot.

## Data Preparation

The initial demands used in developing the revision were obtained from the WAA workbook associated with the June 12, 2015, Notices of Water Unavailability (Exhibit WR-77). I saved the first tab of the workbook as a CSV file (`WR-77_20150610_sacsjcombined_tab1.csv`), which was used to retrieve the demand data for the Sacramento and San Joaquin areas. I saved the third tab of the workbook as `WR-77_20150610_sacsjcombined_tab3.csv`, which was used to retrieve the demand data for the Delta.

On January 29, 2015, I downloaded the latest 2015 Information Order raw data file from the Water Board's intranet and saved it as a CSV file (`2015actual_tb14_2016-01-29.csv`). Prior to saving it, I removed columns containing personal information including login information, addresses, and telephone numbers.

## Data Processing

### Load the Raw Data

After preparing the CSV files, I loaded them into the R environment via the following segment of the R script:

```
# Define misc. variables -----
# Vector of claim types:
claim.types <- c("RIPARIAN", "PRE_1914")
# SJEC Application IDs:
sjec.list <- c("S000477", "S001074", "S001073", "S001098")
# Load demand data from Exhibit WR-77, 0150610_sacsjcombined.xlsx, Tab 1 -----
waa.data <- read.csv("./Data/WR-77 20150610_sacsjcombined_tab1.csv",
  na.strings = c("", " "), stringsAsFactors = FALSE)
# Create list of APP_IDs included in the analysis -----
analysis.apps <- waa.data %>%
  filter(WR_TYPE == "Statement of Div and Use" & ANALYZE == "Y" &
    !HYDROLOGIC_UNIT %in% c("EEL RIVER", "RUSSIAN RIVER")) %>%
  distinct(APP_ID) %>%
  select(APP_ID)
# Remove Oakdale Irr. District- needs to be addressed seperately -----
waa.data <- waa.data %>% filter(!APP_ID == "S004683")
# Create table of Pre-14 priorities -----
p14.priorities <- waa.data %>% filter(!is.na(PRE_14_PRIORITY)) %>%
  select(APP_ID, PRE_14_PRIORITY)
# Create list of APP_IDs included in the analysis within Sac/SJ area -----
sacsj.apps <- waa.data %>%
  filter(WR_TYPE == "Statement of Div and Use" & ANALYZE == "Y" &
    !HYDROLOGIC_UNIT %in% c("EEL RIVER", "RUSSIAN RIVER") &
    !AREA == "LEGAL DELTA") %>%
  distinct(APP_ID) %>%
  select(APP_ID)
# Load Delta demand from Exhibit WR-77, 20150610_sacsjcombined.xlsx, Tab 3 -----
delta.data <- read.csv("./Data/WR-77 20150610_sacsjcombined_tab3.csv",
  na.strings = c("", " "), stringsAsFactors = FALSE)
# Load APP_ID-OWNER-id key -----
IdAppOwner <- read.csv("./Data/IdAppOwner_2015-08-27.csv",
  stringsAsFactors = FALSE)
IdAppOwner$id <- as.integer(IdAppOwner$id)
IdAppOwner <- rename(IdAppOwner, APP_ID = APPL_ID)
# Load 2015 reported diversions raw data file -----
io.2015 <- read.csv("./Data/2015actual_tbl4_2016-01-29.csv",
  stringsAsFactors = FALSE)
```

This script created several reference tables for future use, including: `p14.priorities`, which contains the list of priority years for Pre-1914 claims, `analysis.apps`, which contains the list of statements used in the WAA, and `sacs.j.apps`, which contains the list of statements within the greater Sacramento and San Joaquin watersheds.

The original WAA spreadsheet had four entries for Oakdale Irrigation District's (OID's) Pre-1914 claim (S004683). These represented OID's reported demands being distributed among the four adjudicated priority years and associated diversion rates (5 cfs at an 1855 priority, 127 cfs at an 1885 priority, 66.2 cfs at a 1902 priority, and 847.8 cfs at a 1909 priority). The script segment above removed OID's 2014 entries, so they could be replaced with the revised 2015 entries after the reported 2015 demands were distributed to the four priority years/flow rates identified in the adjudication.

## **Process the Information Order 2015 Demand**

The raw Information Order 2015 data download required considerable cleanup to make it usable. Because of the many inaccurate Application ID values entered by the diverters, I created a key file that relates id to the correct Application ID and Owner from the initial submission for the 2014 and projected 2015 data. This CSV file is named `IdAppOwner_2015-08-27.csv`, and is located in the Data folder of the project folder. Rows with inconsistent records were removed, unneeded columns were dropped (the 2015 actual demands were kept), the row IDs were cross-referenced with the known ID-APP\_ID-Owner key table (`IdAppOwner`) to filter out false entries, and the data frame was rearranged into a long-tidy form. The monthly direct-diversion and diversion-to-storage amounts were then combined for each statement, and any row with an empty demand field was dropped, so that it would not replace an existing value. In other words, if in any month a statement did not contain a 2015 diversion value, the existing 2014 value was kept. Finally, diversions by statements that were not included in the WAA were removed by comparing the Application IDs to those in `analysis.apps`. The resulting data frame, `io.2015`, was generated using the following segment of the script:

```

# IO 2015 Data cleanup -----
# Remove non-ASCII characters in id field:
io.2015$id <- gsub("[^[:alnum:]]//'", "", io.2015$id)
# Remove rows that have blank ids:
io.2015 <- subset(io.2015,!grepl("^[:space:]*$",id))
io.2015 <- subset(io.2015,app_no!="")
# Remove rows that have non-numeric ids, convert id column to integer:
io.2015 <- io.2015[!is.na(as.numeric(io.2015$id)),]
io.2015$id <- as.integer(io.2015$id)
# Keep id and actual diversions columns:
io.2015 <- io.2015 %>%
  select(id,matches("^actual"))
# Join io.2015 to IdAppOwner:
io.2015 <- io.2015 %>%
  inner_join(IdAppOwner,io.2015,by="id") %>%
  select(APP_ID, OWNER, starts_with("actual"))
# Convert diversion columns to numeric:
io.2015 <- japply(io.2015, which(sapply(io.2015, class)=="integer"),
  as.numeric )
# Tidy data -----
io.2015 <- io.2015 %>% gather(key, demand,-c(APP_ID,OWNER))
io.2015$key <- gsub("actual", "", io.2015$key)
io.2015$key <- gsub("direct", "direct.", io.2015$key)
io.2015$key <- gsub("storage", "storage.", io.2015$key)
io.2015$key <- gsub("pre", ".pre", io.2015$key)
io.2015$key <- ifelse (grepl("[0-9]$", io.2015$key),
  paste(io.2015$key, ".riparian",sep=""), io.2015$key)
io.2015 <- separate(io.2015, key, c("DivType","Month","PriorityType"))
io.2015$PriorityType[io.2015$PriorityType == "pre"] <- "pre-14"
io.2015$Month <- as.numeric(io.2015$Month)
# Combined direct diversion and diversion to storage -----
io.2015<-melt(io.2015,id=c("APP_ID","OWNER","DivType","Month","PriorityType"))
io.2015 <- dcast(io.2015,APP_ID+OWNER+Month+PriorityType~variable,sum)
# Remove NA amounts- 2014 demands apply if not reporting for 2015 -----
io.2015 <- io.2015 %>% filter(!is.na(demand))
# Remove apps that are not in analysis -----
io.2015 <- io.2015 %>% filter(APP_ID %in% analysis.apps$APP_ID)

```

The io.2015 data frame contains 947 statements within the analysis area having usable 2015 demands.

## Process The Sacramento and San Joaquin Demand

The following script segment retrieved the Sacramento/San Joaquin area demands from the primary demand data set (`waa.data`). The resulting data frame, `sacsj.data`, was cleaned, tidied, then removed of statements that had corresponding 2015 Information Order demands.

```
# Copy data from waa.data, filter to include Sac/SJ APP_IDs -----
sacsj.data.old <- waa.data %>%
  filter(APP_ID %in% sacsج.apps$APP_ID)
# Remove unnecessary columns -----
sacsj.data.old <- sacsج.data.old %>%
  select(APP_ID, OWNER = PRIMARY_OWNER, AREA, RIPARIAN, PRE_1914,
         PRE_14_PRIORITY, DEMAND_JAN, DEMAND_FEB, DEMAND_MAR, DEMAND_APR,
         DEMAND_MAY, DEMAND_JUN, DEMAND_JUL, DEMAND_AUG, DEMAND_SEP,
         DEMAND_OCT, DEMAND_NOV, DEMAND_DEC)
# Tidy remaining data set -----
sacsج.data.old <- sacsج.data.old %>%
  gather(Month, demand, starts_with("DEMAND_"))
# Replace DEMAND_ with month number -----
sacsج.data.old$Month <- plyr::mapvalues(sacsج.data.old$Month,
                                     c("DEMAND_JAN", "DEMAND_FEB", "DEMAND_MAR",
                                       "DEMAND_APR", "DEMAND_MAY", "DEMAND_JUN",
                                       "DEMAND_JUL", "DEMAND_AUG", "DEMAND_SEP",
                                       "DEMAND_OCT", "DEMAND_NOV", "DEMAND_DEC"),
                                     c(1:12))
sacsج.data.old$Month <- as.numeric(sacsج.data.old$Month)
# Convert RIPARIAN and PRE_1914 columns to logicals -----
sacsج.data.old[claim.types][is.na(sacsج.data.old[claim.types])] <- FALSE
sacsج.data.old[claim.types] <- lapply(sacsج.data.old[claim.types],
                                     function(x) gsub("^Y", TRUE, x))
sacsج.data.old[claim.types] <- lapply(sacsج.data.old[claim.types],
                                     function(x) as.logical(x))
# Create Claim Type column -----
sacsج.data.old <- sacsج.data.old %>%
  mutate(ClaimType = ifelse(PRE_1914 & !RIPARIAN, "pre-14",
                           ifelse(PRE_1914 & RIPARIAN,
                                   "both", "riparian"))) %>%
  select(APP_ID, OWNER, ClaimType, PRE_14_PRIORITY, Month, demand)
# make lists of IO apps in demand table-----
sacsج.io.apps <- sacsج.data.old %>%
  filter(APP_ID %in% io.2015$APP_ID)%>%
  select(APP_ID) %>%
  distinct(APP_ID)
# Remove statements having 2015 Info Order responses -----
sacsج.data <- sacsج.data.old %>%
```



```
filter(!APP_ID %in% io.2015$APP_ID)
```

## Process The Delta Demand

The following script segment generally performed the same data processing for the Delta data as previously done for the Sacramento/San Joaquin data:

```
# Remove columns not needed for analysis: -----
delta.data <- delta.data %>%
  select(APP_ID, OWNER = PRIMARY_OWNER, AREA, RIPARIAN, PRE_1914,
         PRE_14_PRIORITY, DEMAND_JAN, DEMAND_FEB, DEMAND_MAR, DEMAND_APR,
         DEMAND_MAY, DEMAND_JUN, DEMAND_JUL, DEMAND_AUG, DEMAND_SEP,
         DEMAND_OCT, DEMAND_NOV, DEMAND_DEC)
# Tidy remaining data set -----
delta.data <- delta.data %>%
  gather(Month, demand, starts_with("DEMAND_"))
# Replace DEMAND_ with month number -----
delta.data$Month <- plyr::mapvalues(delta.data$Month,
                                   c("DEMAND_JAN", "DEMAND_FEB", "DEMAND_MAR",
                                     "DEMAND_APR", "DEMAND_MAY", "DEMAND_JUN",
                                     "DEMAND_JUL", "DEMAND_AUG", "DEMAND_SEP",
                                     "DEMAND_OCT", "DEMAND_NOV", "DEMAND_DEC"),
                                   c(1:12))
delta.data$Month <- as.numeric(delta.data$Month)
# Convert RIPARIAN and PRE_1914 columns to logicals -----
delta.data[claim.types][is.na(delta.data[claim.types])] <- FALSE
delta.data[claim.types] <- lapply(delta.data[claim.types],
                                  function(x) gsub("^Y", TRUE, x))
delta.data[claim.types] <- lapply(delta.data[claim.types],
                                  function(x) as.logical(x))
# Create ClaimType column -----
delta.data <- delta.data %>%
  mutate(ClaimType = ifelse(PRE_1914 & !RIPARIAN, "pre-14",
                           ifelse(PRE_1914 & RIPARIAN, "both", "riparian"))) %>%
  select(APP_ID, OWNER, ClaimType, PRE_14_PRIORITY, Month, demand)
# Identify s only claims in Delta -----
delta.p14.apps <- delta.data %>%
  filter(ClaimType == "pre-14") %>%
  select(APP_ID) %>%
  distinct(APP_ID)
# Make lists of IO apps in Delta -----
delta.io.apps <- delta.data %>%
  filter(APP_ID %in% io.2015$APP_ID)%>%
```

```

select(APP_ID) %>%
distinct(APP_ID)
# Remove statements in 2015 Info Order responses -----
delta.data <- delta.data %>%
  filter(!APP_ID %in% io.2015$APP_ID)

```

## Incorporate the 2015 Information Order Demands

In the original WAA, the reported 2014 Information Order Riparian and Pre-1914 demands were considered separately for the diversions in the Sacramento/San Joaquin area (each statement had a separate line for each claim type), so that the demands could be attributed to the appropriate priority. Stakeholders in the Delta having statements with both Riparian and Pre-1914 claims had indicated that they would divert on their Riparian claim if their Pre-1914 claims were curtailed, so their monthly 2015 Riparian and Pre-1914 demands were combined and considered as Riparian demands when generating the plot. The following script segment splits the 2015 demands data frame (`io.2015`) into Sacramento/San Joaquin and Delta data (`sacsj.io.2015` and `delta.io.2015`, respectively). It then splits `delta.io.2015` into the Pre-1914-only demands (`delta.io.p14`) and the remaining Riparian and combined Riparian/Pre-1914 demands (`delta.io.rip`). The monthly Riparian and Pre-1914 demands for each statement were added together, and the Claim Type was changed to "riparian." The data frames of the demands not subject to the Information Order (`sacsj.data` and `delta.data`), and the data frames containing the 2015 Information Order demands (`sacsj.io.2015`, `delta.io.p14`, and `delta.io.rip`) were joined together to form the complete revised demand data frame (`demand.with.io`). Lastly, the monthly demand values in `demand.with.io` were converted from acre-feet to cfs.

```

# Join Pre-14 priority years to IO demands -----
io.2015 <- io.2015 %>%
  left_join(., p14.priorities, by = "APP_ID") %>%
  select(APP_ID, OWNER, ClaimType = PriorityType, PRE_14_PRIORITY, Month, demand)
# Remove Pre-14 priorities from riparian entries (relic of join) -----

```

```

io.2015 <- io.2015 %>%
  mutate(PRE_14_PRIORITY = ifelse(ClaimType == "riparian",
                                  NA, PRE_14_PRIORITY))

# Split io.2015 into Sac/SJ and Delta -----
sacsj.io.2015 <- io.2015 %>%
  filter(APP_ID %in% sacsjo.apps$APP_ID)
delta.io.2015 <- io.2015 %>%
  filter(APP_ID %in% delta.io.apps$APP_ID)

# Split delta.io.2015 into Pre-14 only claims and the rest -----
delta.io.p14 <- delta.io.2015 %>%
  filter(APP_ID %in% delta.p14.apps$APP_ID & ClaimType == "pre-14")
delta.io.rip <- delta.io.2015 %>%
  filter(!APP_ID %in% delta.p14.apps$APP_ID)

# Combine Delta riparian/both to riparian -----
delta.io.rip <- delta.io.rip %>%
  group_by(APP_ID, OWNER, Month) %>%
  summarize(demand = sum(demand))
delta.io.rip <- delta.io.rip %>%
  mutate(ClaimType = "riparian", PRE_14_PRIORITY = NA) %>%
  select(APP_ID, OWNER, ClaimType, PRE_14_PRIORITY, Month, demand)
delta.io.rip <- as.data.frame(delta.io.rip)

# Combine: sacsjo.data, delta.data, sacsjo.io.2015, delta.io.p14, delta.io.rip ---
demand.with.io <- rbind(sacsjo.data, delta.data, sacsjo.io.2015,
                       delta.io.p14, delta.io.rip)

# Convert monthly demands from acre-feet to cfs -----
demand.with.io <- demand.with.io %>%
  mutate(demand = demand / days_in_month(Month) / 1.9835)

```

As described previously, the original WAA spreadsheet had four entries for OID's Pre-1914 claim S004683, with its 2014 reported demands distributed among the four adjudicated priority years and associated diversion rates (5 cfs at an 1855 priority, 127 cfs at an 1885 priority, 66.2 cfs at a 1902 priority, and 847.8 cfs at a 1909 priority). The script segment below distributes the 2015 demands by filling the demands up by seniority. For example, 5 cfs would be distributed to the 1855 priority, then 127 cfs to the 1885, priority, and so on, until the demand in each month has been fully distributed.

```

# Distribute OID's 2015 demands consistent with adjudication -----
OID.amount <- io.2015 %>%
  filter(APP_ID == "S004683" & ClaimType == "pre-14") %>%
  mutate(demand = demand / days_in_month(Month) / 1.9835) %>% # change to cfs
  select(-APP_ID, -OWNER, -ClaimType, -PRE_14_PRIORITY) %>%
  spread(Month, demand)
OID.amount <- as.matrix(OID.amount)
OID.demands <- matrix(NA, nrow = 4, ncol = 12)
# Adjudicated rates for 1855, 1885, 1902, and 1909
adj.amounts <- matrix(c(5.0, 127.0, 66.2, 847.8))
# Fill up demands by priority (fill up 1855 first, then 1885, etc.)
for(i in 1:3) {
  for( j in 1:12) {
    if(OID.amount[j] > adj.amounts[i]) {
      OID.demands[i,j] <- adj.amounts[i]
      OID.amount[j] <- OID.amount[j] - adj.amounts[i]
    } else
      if(OID.amount[j] < adj.amounts[i]) {
        OID.demands[i,j] <- OID.amount[j]
        OID.amount[j] <- 0
      }
  }
}
OID.demands[4, ] <- OID.amount
# Rebuild dataframe to bind to demand.with.io:
OID.df <- data.frame(APP_ID = rep("S004683",4),
                    OWNER = rep("OAKDALE IRRIGATION DISTRICT",4),
                    ClaimType = rep("pre-14",4),
                    PRE_14_PRIORITY = c(1855, 1885, 1902, 1909),
                    stringsAsFactors = FALSE)
OID.df <- cbind(OID.df, OID.demands)
OID.df <- OID.df %>%
  gather(key = Month, value = demand, -APP_ID, -OWNER,
        -ClaimType, -PRE_14_PRIORITY)
OID.df$Month <- as.numeric(OID.df$Month)
demand.with.io <- rbind(demand.with.io, OID.df)

```

The resulting distribution of OID's 2015 monthly demands was assigned as follows:

```
##
## -----
## PRE_14_PRIORITY  1    2    3    4    5    6    7    8    9   10   11   12
## -----
##      1855        0    0    5    5    5    5    5    5    5    4.32  0
##
##      1885        0    0   127  127  127  127  127  19.7  6.16  78.3  0    0
##
##      1902        0    0   66.2 66.2 66.2 66.2 17    0    0    0    0    0
##
##      1909        0    0   262  376  555  286   0    0    0    0    0    0
## -----
```

## Verification

To verify the completion of processing the original Sacramento/San Joaquin Demands prior to inserting the 2015 Information Order demand values, I subset the original monthly demands of the four statements held by the San Joaquin River Exchange Contractors (SJEC) for April through August to show the demands used in the original WAA. I chose these four statements because they have considerably large diversions. The following code chunk extracts and lists the four SJEC 2014 Information Order demands used in the original WAA:

```
##
## -----
## APP_ID           OWNER                4    5    6    7    8
## -----
## S000477  CENTRAL CALIF IRRIGATION 17939 43416 59787 74100 61129
##           DISTRICT
##
## S001073  COLUMBIA CANAL COMPANY  2904  4967  6776  7865  4614
##
## S001074  SAN LUIS CANAL COMPANY  4106  8400  19428 25267 18391
##
## S001098  FIREBAUGH CANAL COMPANY  2802  4578  6762  6940  5219
## -----
```

The 4, 5, 6, 7, and 8 shown in the top row of the result output above represent the corresponding numerical months of April through August, respectively. The demand values are

identical to the values in the the original WAA workbook (Exhibit WR-77). The following code chunk extracts and lists the four SJEC 2015 Information Order demands that replaced the 2014 values:

```
##
## -----
## APP_ID          OWNER                4      5      6      7      8
## -----
## S000477  CENTRAL CALIF IRRIGATION 22532 31791 52135 56550 37256
##          DISTRICT
##
## S001073  COLUMBIA CANAL COMPANY  3721  5143  5719  6087  3562
##
## S001074  SAN LUIS CANAL COMPANY  2201  6006 17348 20549 11529
##
## S001098  FIREBAUGH CANAL COMPANY   715  2180  5474  5995  2839
## -----
```

These values are are identical to those in the `io.2015` data frame, which contains the 2015 Information Order data. This demonstrates that the 2015 Information Order values correctly replaced the corresponding 2014 values.

## Supply Data

To incorporate the supply data, I copied the daily Full Natural Flow (FNF) and adjusted 50-, 90-, and 99-percent exceedance FNF forecast data from the Senior Chart tab of Exhibit WR-77 (specifically rows 13 through 226 of columns A, Q, R, S, and T), and saved it as a CSV file (`WR-77_20150610_sacsjcombined_fnf.csv`). These data were then loaded into a data frame named `flows`. This data frame was used as the foundation to build the `plot.data` data frame which contains the combined supply and demand data from which to construct the plot.

```
# Load data -----
# FNF data from Exhibit WR-77, 20150610_sacsjcombined.xlsx, Tab 8:
flows <- read.csv("./Data/WR-77_20150610_sacsjcombined_fnf.csv",
                 na.strings = "#N/A", stringsAsFactors = FALSE)
flows$date <- as.Date(flows$date, format = "%m/%d/%y")
flows <- flows %>%
```

```
mutate(Month = month(date)) %>%
select(date, Month, daily.FNF, forecast.50, forecast.90, forecast.99)
```

## Build The Supply/Demand Plot Data Frame

The following script generates the `plot.data` data frame from which the plot is generated:

```
# Calculate total riparian + both demand for each month -----
rip.demand <- demand.with.io %>%
  filter(ClaimType %in% c("riparian", "both")) %>%
  group_by(Month) %>%
  summarize(rip.demand = sum(demand, na.rm = TRUE))
# Calculate total pre-14 demand for each month -----
p14.demand <- demand.with.io %>%
  filter(ClaimType == "pre-14") %>%
  group_by(Month) %>%
  summarize(p14.demand = sum(demand, na.rm = TRUE))
# Create summary table for plot -----
plot.data <- flows %>%
  left_join(., rip.demand, by = "Month") %>%
  left_join(., p14.demand, by = "Month") %>%
  select(-Month) %>%
  gather(variable, flow, -date)
### Create df for Pre-14 Priority Lines -----
# Select Pre-14 demands from demand data -----
p14.priority.demand <- demand.with.io %>%
  filter(ClaimType == "pre-14") %>%
  select(PRE_14_PRIORITY, Month, demand)
# If priority year is greater than 1914, assume 1914 -----
p14.priority.demand <- p14.priority.demand %>%
  mutate(PRE_14_PRIORITY = ifelse(PRE_14_PRIORITY > 1914,
  1914,
  PRE_14_PRIORITY))
# Subtotal Pre-14 demands by priority year, month -----
p14.priority.demand <- p14.priority.demand %>%
  group_by(PRE_14_PRIORITY, Month) %>%
  summarise(demand = sum(demand, na.rm = TRUE))
# Calculate cumulative Pre-14 sums -----
p14.priority.demand <- p14.priority.demand %>%
  group_by(Month) %>%
  arrange(PRE_14_PRIORITY) %>%
  mutate(cs = cumsum(demand)) %>%
```

```

select(-demand)
# Add riparian demands to Pre-14 demands to stack on plot correctly -----
p14.priority.demand <- p14.priority.demand %>%
  left_join(., rip.demand, by = "Month") %>%
  mutate(cs.adj = cs + rip.demand) %>%
  select(-cs, -rip.demand)
# Create df for Pre-14 plot lines -----
p14.priority.demand <- as.data.frame(p14.priority.demand)
p14.priority.demand <- p14.priority.demand %>%
  spread(PRE_14_PRIORITY, cs.adj)
p14.plot.df <- as.data.frame(flows$date)
names(p14.plot.df)[1] <- "date"
p14.plot.df <- p14.plot.df %>%
  mutate(Month = month(date)) %>%
  left_join(., p14.priority.demand, by = "Month") %>%
  select(-Month)
p14.plot.df <- p14.plot.df %>% gather(variable, flow, -date)
plot.data <- rbind(plot.data, p14.plot.df)

```

The following script builds the plot using the ggplot2 package. The resulting plot is shown in Figure 1.

```

# It's plotting time! -----
# Color palettes:
fPalette <- c("#E69F00", "#F0E442")
lPalette <- c("red", "red", "blue", "darkgreen", "darkorchid4")
# Build plot
g <- ggplot(plot.data, aes(x = date, y = flow))
g <- g + scale_y_continuous(labels = comma)
g <- g + geom_area(data = subset(plot.data,
                                variable %in% c("rip.demand", "p14.demand")),
                  aes(fill = variable))
g <- g + geom_line(data = subset(plot.data, variable %in% "daily.FNF" &
                                !is.na(flow)),
                  aes(color = variable), alpha = 0.4)
g <- g + geom_line(data = subset(plot.data,
                                variable %in% c("forecast.50", "forecast.90") &
                                !is.na(flow)), aes(color = variable),
                  linetype = 2, alpha = 0.5)
g <- g + geom_point(data = subset(plot.data,
                                  variable %in% c("forecast.50", "forecast.90") &
                                  !is.na(flow)),
                   aes(color = variable), size = 4)
g <- g + geom_line(data = subset(plot.data, variable == "1902"),
                  aes(color = variable), linetype = 5)

```



```
g <- g + geom_line(data = subset(plot.data, variable == "1913"),
                  aes(color = variable), linetype = 4)
g <- g + geom_vline(xintercept = as.numeric(as.Date("2015-06-12")),
                  linetype = 4, color = "black")
g <- g + scale_color_manual(name="Lines",
                           breaks=c("daily.FNF", "forecast.50","forecast.90", "1902", "1913"),
                           labels=c("Daily FNF", "Adj. Monthly 50-Percent Exceedance FNF Forecast",
                                     "Adj. Monthly 90-Percent Exceedance FNF Forecast",
                                     "Cumulative Senior Demand Through 1902 Priority",
                                     "Cumulative Senior Demand Through 1913 Priority"),
                           values = lPalette)
g <- g + scale_fill_manual(values=fPalette,
                          name="Areas",
                          breaks=c("rip.demand", "p14.demand"),
                          labels=c("Riparian Demand", "Pre-14 Demand"))
g <- g + guides(color = guide_legend(override.aes =
                                     list(shape=c(NA, 16, 16, NA, NA),
                                           linetype=c(1, 0, 0, 5, 4))))
g <- g + theme(legend.justification=c(1,1), legend.position=c(1,1), legend.box.just = "right")
g <- g + labs(title = "Figure 1
                Revised 2015 Sacramento/San Joaquin Senior Supply/Demand
                With 2015 Informational Order Demands") +
          theme(plot.title = element_text(lineheight=.8, face="bold"))
g <- g + labs(x = "", y = "Flow in Cubic Feet per Second (cfs)")
```

**Figure 1**  
**Revised 2015 Sacramento/San Joaquin Senior Supply/Demand**  
**With 2015 Informational Order Demands**

A-16



## Discussion

Looking at Figure 1, the yellow and orange/tan shaded areas of the plot represent the resulting aggregate Riparian and Pre-1914 demand, respectively. The green and purple points represent the adjusted monthly FNF exceedance forecasts at the 50- and 90-percent levels, respectively. The dashed lines connecting these points do not represent any values, they just help the viewer follow the sequence of each set of points. The transparent solid blue line represents the combined ten-station daily FNF flows. The red dashed line represents the aggregate demand through the 1902 priority level, and the red dashed/dotted line represents the aggregate demand through the 1913 priority level. The black vertical dashed line indicates the day on which the notices were issued (June 12, 2015). From the resulting supply/demand plot data frame containing the 2015 Information Order demands, (`plot.data`), the following supply and demand values are applicable for June:

- Riparian Demand: 5,622 cfs.
- Pre-1914 Demand: 8,150 cfs.
- Combined Riparian and Pre-1914 Demand: 13,771 cfs.
- Senior Demand Through 1902: 11,759 cfs.
- Adjusted 50% Exceedance Forecasted FNF: 8,974 cfs.

## List of R Packages Used

- [1] Gergely Daróczi and Roman Tsegelskyi. *pander: An R Pandoc Writer*, 2015. R package version 0.6.0.
- [2] Ari B. Friedman. *taRifx: Collection of utility and convenience functions.*, 2014. R package version 1.0.6.
- [3] Garrett Golemund, Vitalie Spinu, and Hadley Wickham. *lubridate: Make Dealing with Dates a Little Easier*, 2015. R package version 1.5.0.

- [4] R Core Team. *R: A Language and Environment for Statistical Computing*. R Foundation for Statistical Computing, Vienna, Austria, 2015.
- [5] Hadley Wickham. *reshape2: Flexibly Reshape Data: A Reboot of the Reshape Package.*, 2014. R package version 1.4.1.
- [6] Hadley Wickham. *scales: Scale Functions for Visualization*, 2015. R package version 0.3.0.
- [7] Hadley Wickham. *tidyr: Easily Tidy Data with 'spread()' and 'gather()' Functions*, 2016. R package version 0.4.1.
- [8] Hadley Wickham and Winston Chang. *ggplot2: An Implementation of the Grammar of Graphics*, 2015. R package version 2.0.0.
- [9] Hadley Wickham and Romain Francois. *dplyr: A Grammar of Data Manipulation*, 2015. R package version 0.4.3.
- [10] Yihui Xie. *knitr: A General-Purpose Package for Dynamic Report Generation in R*, 2016. R package version 1.12.3.

## Session Information

```
## R version 3.2.3 (2015-12-10)
## Platform: x86_64-w64-mingw32/x64 (64-bit)
## Running under: Windows 7 x64 (build 7601) Service Pack 1
##
## locale:
## [1] LC_COLLATE=English_United States.1252
## [2] LC_CTYPE=English_United States.1252
## [3] LC_MONETARY=English_United States.1252
## [4] LC_NUMERIC=C
## [5] LC_TIME=English_United States.1252
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets  methods   base
##
## other attached packages:
## [1] scales_0.3.0    lubridate_1.5.0 ggplot2_2.0.0  reshape2_1.4.1
## [5] dplyr_0.4.3     tidyr_0.4.1     pander_0.6.0  taRifx_1.0.6
## [9] knitr_1.12.3
##
## loaded via a namespace (and not attached):
## [1] Rcpp_0.12.3      magrittr_1.5      munsell_0.4.3    colorspace_1.2-6
## [5] R6_2.1.2         stringr_1.0.0    highr_0.5.1      plyr_1.8.3
## [9] tools_3.2.3     parallel_3.2.3   grid_3.2.3       gtable_0.1.2
## [13] DBI_0.3.1        lazyeval_0.1.10  assertthat_0.1   digest_0.6.9
## [17] formatR_1.2.1    evaluate_0.8      labeling_0.3     stringi_1.0-1
```

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: TUSCANY RESEARCH INSTITUTE  
Statement Number: S020995  
Date Submitted: 2013-06-20

1. Water is used under	Riparian Claim Pre-1914 Claim Other: overlying and statutory rights
2. Year of first use	1800

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		139.3	33.25
February		71.67	44.8
March		199	124.38
April		179.96	112.47
May		290.8	181.75
June		496.5	310.31
July		562.45	351.53
August		427.07	266.92
September		223.99	139.99
October		98.74	61.71
November		178.3	57.63
December		146.31	37.63
Total		3014.09	1722.37
Comments			

**5. Water Diversion Measurement**

a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage	
b. measuring devices used	Types of devices used	
	Additional technology used	
c. Description of additional technology used		
d. Who installed your measuring device(s)		
e. Make, model number, and last calibration date of		

	your measuring device(s)	
	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	Other
f.	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation, maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost-effective because the value of the local benefits of installing and maintaining meters is not greater than the value of the local cost of implementing that measure. There are no apparent grants available to otherwise cover costs of water meters and related actions. Moreover, the unique hydrogeological characteristics of the Delta (e.g., tides, seepage, interconnected channels, etc.) indicate that meters are not the best available technology in this region. Any water diverted in the Delta which is not consumed or evaporated is recycled to the Delta Pool for reuse. As further support for the conclusion that measuring devices are not locally cost-effective reference is made to the documentation on file with the SWRCB attesting to the lack of such costeffectiveness submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the SWRCB's follow-up solicitation of comments (due November 18, 2011) re the same.
	Method(s) used as an alternative to direct measurement	Crop duty estimates/consumptive use estimates
9.	Explanation of method(s) used as an alternative to direct measurement	Used ITRC REPORT 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for Surface Irrigation, Typical year adjusted for the reporting year using CIMIS monthly ETo for Manteca. For crops not covered by the ITRC report ETc was determined using ratios to alfalfa from Table A-5, DWR Bulletin 168, October 1978.

<b>6. Purpose of Use</b>	
Irrigation	864.1 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
	Are you now employing water conservation efforts?	Yes
a.	Describe any water conservation efforts you have initiated	Good water management and farming practices, lined ditches, pipelines, drip irrigation, sprinkler irrigation, low energy spray irrigation, cover crops, mulching, laser leveling. Any diverted water which is not consumed or evaporated is recycled to the Delta Pool. Credit is claimed for these water conservation efforts under section 1011 of the Water Code. A specific amount conserved is not reported due to the lack of a present method to precisely quantify that amount.
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions	

due to conservation efforts.	
------------------------------	--

9. Water Quality and Wastewater Reclamation	
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes? <span style="float: right;">No</span>
	Amount of reduced diversion
	Type of substitute water supply
b.	Amount of substitute water supply used
	I have data to support the above surface water use reductions due to the use of a substitute water supply

10. Conjunctive Use of Surface Water and Groundwater	
a.	Are you now using groundwater in lieu of surface water? <span style="float: right;">No</span>
b.	Amount of groundwater used
	I have data to support the above surface water use reductions due to the use of groundwater.

11a. Additional Remarks	
<p>The amount diverted is a multiple of the reported use amount, plus a factor to account for field flooding (if any). The multiple is to account for additional water that is diverted but not consumed or evaporated. (Note: add the following insertion to the above insertion if you had multiple PODs deliver water to the same field or parcel): The point of diversion that is the subject of this report is one of <u>  2  </u> (insert number) points of diversion that provided water to an approximate <u>  864.10  </u> acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them.</p>	

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Clint
Last Name	Womack
Relation to Water Right	
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes



**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: CCRC FARMS, LLC  
Statement Number: S021018  
Date Submitted: 2013-06-20

1. Water is used under	Riparian Claim Pre-1914 Claim Other: overlying and statutory rights
2. Year of first use	1800

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		409.17	65.33
February		98.05	61.28
March		278.43	174.02
April		199.17	124.48
May		382.53	239.08
June		900.5	562.81
July		1015.8	634.87
August		677.08	423.18
September		200.86	125.54
October		116.72	72.95
November		435.32	81.67
December		406.93	63.93
Total		5120.56	2629.14
Comments			

**5. Water Diversion Measurement**

a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage	
b. Types of measuring devices used		
Additional technology used		
c. Description of additional technology used		
d. Who installed your measuring device(s)		
e. Make, model number, and last calibration date of		

	your measuring device(s)	
	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	Other
f.	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation, maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost-effective because the value of the local benefits of installing and maintaining meters is not greater than the value of the local cost of implementing that measure. There are no apparent grants available to otherwise cover costs of water meters and related actions. Moreover, the unique hydrogeological characteristics of the Delta (e.g., tides, seepage, interconnected channels, etc.) indicate that meters are not the best available technology in this region. Any water diverted in the Delta which is not consumed or evaporated is recycled to the Delta Pool for reuse. As further support for the conclusion that measuring devices are not locally cost-effective reference is made to the documentation on file with the SWRCB attesting to the lack of such costeffectiveness submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the SWRCB's follow-up solicitation of comments (due November 18, 2011) re the same.
	Method(s) used as an alternative to direct measurement	Crop duty estimates/consumptive use estimates
9.	Explanation of method(s) used as an alternative to direct measurement	Used ITRC REPORT 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for Surface Irrigation, Typical year adjusted for the reporting year using CIMIS monthly ETo for Manteca. For crops not covered by the ITRC report ETc was determined using ratios to alfalfa from Table A-5, DWR Bulletin 168, October 1978.

<b>6. Purpose of Use</b>	
Irrigation	1243.7 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
	Are you now employing water conservation efforts?	Yes
a.	Describe any water conservation efforts you have initiated	Good water management and farming practices, lined ditches, pipelines, drip irrigation, sprinkler irrigation, low energy spray irrigation, cover crops, mulching, laser leveling. Any diverted water which is not consumed or evaporated is recycled to the Delta Pool. Credit is claimed for these water conservation efforts under section 1011 of the Water Code. A specific amount conserved is not reported due to the lack of a present method to precisely quantify that amount.
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions	

due to conservation efforts.	
------------------------------	--

9. Water Quality and Wastewater Reclamation	
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes? <span style="float: right;">No</span>
	Amount of reduced diversion
	Type of substitute water supply
b.	Amount of substitute water supply used
	I have data to support the above surface water use reductions due to the use of a substitute water supply

10. Conjunctive Use of Surface Water and Groundwater	
a.	Are you now using groundwater in lieu of surface water? <span style="float: right;">No</span>
b.	Amount of groundwater used
	I have data to support the above surface water use reductions due to the use of groundwater.

11a. Additional Remarks	
<p>The amount diverted is a multiple of the reported use amount, plus a factor to account for field flooding (if any). The multiple is to account for additional water that is diverted but not consumed or evaporated. (Note: add the following insertion to the above insertion if you had multiple PODs deliver water to the same field or parcel): The point of diversion that is the subject of this report is one of _____ (insert number) points of diversion that provided water to an approximate _____ acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them.</p>	

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Clint
Last Name	Womack
Relation to Water Right	
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: TUSCANY RESEARCH INSTITUTE  
Statement Number: S021024  
Date Submitted: 2013-06-19

1. Water is used under	Riparian Claim Pre-1914 Claim Other: overlying and statutory rights
2. Year of first use	1800

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		139.3	33.25
February		71.67	44.8
March		199	124.38
April		179.96	112.47
May		290.8	181.75
June		496.5	310.31
July		562.45	351.53
August		427.07	266.92
September		223.99	139.99
October		98.74	61.71
November		178.3	57.63
December		146.31	37.63
Total		3014.09	1722.37
Comments			

**5. Water Diversion Measurement**

a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage	
b. Types of measuring devices used		
Additional technology used		
c. Description of additional technology used		
d. Who installed your measuring device(s)		
e. Make, model number, and last calibration date of		

	your measuring device(s)	
	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	Other
f.	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation, maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost-effective because the value of the local benefits of installing and maintaining meters is not greater than the value of the local cost of implementing that measure. There are no apparent grants available to otherwise cover costs of water meters and related actions. Moreover, the unique hydrogeological characteristics of the Delta (e.g., tides, seepage, interconnected channels, etc.) indicate that meters are not the best available technology in this region. Any water diverted in the Delta which is not consumed or evaporated is recycled to the Delta Pool for reuse. As further support for the conclusion that measuring devices are not locally cost-effective reference is made to the documentation on file with the SWRCB attesting to the lack of such costeffectiveness submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the SWRCB's follow-up solicitation of comments (due November 18, 2011) re the same.
	Method(s) used as an alternative to direct measurement	Crop duty estimates/consumptive use estimates
9.	Explanation of method(s) used as an alternative to direct measurement	Used ITRC REPORT 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for Surface Irrigation, Typical year adjusted for the reporting year using CIMIS monthly ETo for Manteca. For crops not covered by the ITRC report ETc was determined using ratios to alfalfa from Table A-5, DWR Bulletin 168, October 1978.

<b>6. Purpose of Use</b>	
Irrigation	864.1 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
	Are you now employing water conservation efforts?	Yes
a.	Describe any water conservation efforts you have initiated	Good water management and farming practices, pipelines, drip irrigation, , cover crops, mulching, laser leveling. Any diverted water which is not consumed or evaporated is recycled to the Delta Pool. Credit is claimed for these water conservation efforts under section 1011 of the Water Code. A specific amount conserved is not reported due to the lack of a present method to precisely quantify that amount.
	Amount of water conserved	Acre-Feet
b.	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation	
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?
	No
	Amount of reduced diversion
	Type of substitute water supply
b.	Amount of substitute water supply used
	I have data to support the above surface water use reductions due to the use of a substitute water supply

10. Conjunctive Use of Surface Water and Groundwater	
a.	Are you now using groundwater in lieu of surface water?
	No
b.	Amount of groundwater used
	I have data to support the above surface water use reductions due to the use of groundwater.

**11a. Additional Remarks**

The amount diverted is a multiple of the reported use amount, plus a factor to account for field flooding (if any). The multiple is to account for additional water that is diverted but not consumed or evaporated. (Note: add the following insertion to the above insertion if you had multiple PODs deliver water to the same field or parcel): The point of diversion that is the subject of this report is one of 2 (insert number) points of diversion that provided water to an approximate 864.10 acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Clint
Last Name	Womack
Relation to Water Right	
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: CCRC FARMS, LLC  
Statement Number: S021030  
Date Submitted: 2013-06-20

1. Water is used under	Riparian Claim Pre-1914 Claim Other: overlying and statutory rights
2. Year of first use	1800

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		409.17	65.33
February		98.05	61.28
March		278.43	174.02
April		199.17	124.48
May		382.53	239.08
June		900.5	562.81
July		1015.8	634.87
August		677.08	423.18
September		200.86	125.54
October		116.72	72.95
November		435.32	81.67
December		406.93	63.93
Total		5120.56	2629.14
Comments			

**5. Water Diversion Measurement**

a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage	
b. Types of measuring devices used		
c. Additional technology used		
c. Description of additional technology used		
d. Who installed your measuring device(s)		
e. Make, model number, and last calibration date of		

	your measuring device(s)	
	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	Other
f.	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation, maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost-effective because the value of the local benefits of installing and maintaining meters is not greater than the value of the local cost of implementing that measure. There are no apparent grants available to otherwise cover costs of water meters and related actions. Moreover, the unique hydrogeological characteristics of the Delta (e.g., tides, seepage, interconnected channels, etc.) indicate that meters are not the best available technology in this region. Any water diverted in the Delta which is not consumed or evaporated is recycled to the Delta Pool for reuse. As further support for the conclusion that measuring devices are not locally cost-effective reference is made to the documentation on file with the SWRCB attesting to the lack of such costeffectiveness submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the SWRCB's follow-up solicitation of comments (due November 18, 2011) re the same.
	Method(s) used as an alternative to direct measurement	Crop duty estimates/consumptive use estimates
9.	Explanation of method(s) used as an alternative to direct measurement	Used ITRC REPORT 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for Surface Irrigation, Typical year adjusted for the reporting year using CIMIS monthly ETo for Manteca. For crops not covered by the ITRC report ETc was determined using ratios to alfalfa from Table A-5, DWR Bulletin 168, October 1978.

<b>6. Purpose of Use</b>	
Irrigation	1243.7 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
	Are you now employing water conservation efforts?	Yes
a.	Describe any water conservation efforts you have initiated	Good water management and farming practices, pipelines, drip irrigation,, cover crops, mulching, laser leveling. Any diverted water which is not consumed or evaporated is recycled to the Delta Pool. Credit is claimed for these water conservation efforts under section 1011 of the Water Code. A specific amount conserved is not reported due to the lack of a present method to precisely quantify that amount.
	Amount of water conserved	Acre-Feet
b.	I have data to support the above surface water use reductions due to conservation efforts.	



9. Water Quality and Wastewater Reclamation	
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?
	No
	Amount of reduced diversion
	Type of substitute water supply
b.	Amount of substitute water supply used
	I have data to support the above surface water use reductions due to the use of a substitute water supply

10. Conjunctive Use of Surface Water and Groundwater	
a.	Are you now using groundwater in lieu of surface water?
	No
b.	Amount of groundwater used
	I have data to support the above surface water use reductions due to the use of groundwater.

**11a. Additional Remarks**

The amount diverted is a multiple of the reported use amount, plus a factor to account for field flooding (if any). The multiple is to account for additional water that is diverted but not consumed or evaporated. (Note: add the following insertion to the above insertion if you had multiple PODs deliver water to the same field or parcel): The point of diversion that is the subject of this report is one of 2 (insert number) points of diversion that provided water to an approximate 1243.70 acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Clint
Last Name	Womack
Relation to Water Right	
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: CCRC FARMS, LLC  
Statement Number: S021032  
Date Submitted: 2013-06-19

1. Water is used under	Riparian Claim Pre-1914 Claim Other: overlying & statutory rights
2. Year of first use	1800

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		49.71	14.63
February		22.45	14.03
March		59.2	37
April		42.06	26.29
May		97.94	61.21
June		214.53	134.08
July		216.4	135.25
August		102.82	64.26
September		43.25	27.03
October		27.03	16.89
November		56.15	18.65
December		49.39	14.43
Total		980.93	563.75
Comments			

**5. Water Diversion Measurement**

a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage	
b. Types of measuring devices used		
Additional technology used		
c. Description of additional technology used		
d. Who installed your measuring device(s)		
e. Make, model number, and last calibration date of		

	your measuring device(s)	
	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	Other
f.	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation, maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost-effective because the value of the local benefits of installing and maintaining meters is not greater than the value of the local cost of implementing that measure. There are no apparent grants available to otherwise cover costs of water meters and related actions. Moreover, the unique hydrogeological characteristics of the Delta (e.g., tides, seepage, interconnected channels, etc.) indicate that meters are not the best available technology in this region. Any water diverted in the Delta which is not consumed or evaporated is recycled to the Delta Pool for reuse. As further support for the conclusion that measuring devices are not locally cost-effective reference is made to the documentation on file with the SWRCB attesting to the lack of such costeffectiveness submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the SWRCB's follow-up solicitation of comments (due November 18, 2011) re the same.
	Method(s) used as an alternative to direct measurement	Crop duty estimates/consumptive use estimates
9.	Explanation of method(s) used as an alternative to direct measurement	Used ITRC REPORT 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for Surface Irrigation, Typical year adjusted for the reporting year using CIMIS monthly ETo for Manteca. For crops not covered by the ITRC report ETc was determined using ratios to alfalfa from Table A-5, DWR Bulletin 168, October 1978.

<b>6. Purpose of Use</b>	
Irrigation	379.6 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
	Are you now employing water conservation efforts?	Yes
a.	Describe any water conservation efforts you have initiated	Good water management and farming practices, lined ditches, pipelines, drip irrigation, sprinkler irrigation, low energy spray irrigation, cover crops, mulching, laser leveling. Any diverted water which is not consumed or evaporated is recycled to the Delta Pool. Credit is claimed for these water conservation efforts under section 1011 of the Water Code. A specific amount conserved is not reported due to the lack of a present method to precisely quantify that amount.
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions	

due to conservation efforts.	
------------------------------	--

9. Water Quality and Wastewater Reclamation	
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes? <span style="float: right;">No</span>
	Amount of reduced diversion
	Type of substitute water supply
b.	Amount of substitute water supply used
	I have data to support the above surface water use reductions due to the use of a substitute water supply

10. Conjunctive Use of Surface Water and Groundwater	
a.	Are you now using groundwater in lieu of surface water? <span style="float: right;">No</span>
b.	Amount of groundwater used
	I have data to support the above surface water use reductions due to the use of groundwater.

11a. Additional Remarks	
<p>The amount diverted is a multiple of the reported use amount, plus a factor to account for field flooding (if any). The multiple is to account for additional water that is diverted but not consumed or evaporated. (Note: add the following insertion to the above insertion if you had multiple PODs deliver water to the same field or parcel): The point of diversion that is the subject of this report is one of <u>  2  </u> (insert number) points of diversion that provided water to an approximate <u>  379.60  </u> acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them.</p>	

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Clint
Last Name	Womack
Relation to Water Right	
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012

Primary Owner: CCRC FARMS, LLC  
Statement Number: S021033  
Date Submitted: 2013-06-20

1. Water is used under	Riparian Claim Pre-1914 Claim Other: overlying and statutory rights
2. Year of first use	1800

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used			
Month	Rate of diversion	Amount directly diverted or collected to storage (Acre-Feet)	Amount beneficially used (Acre-Feet)
January		49.71	14.63
February		22.45	14.03
March		59.2	37
April		42.06	26.29
May		97.94	61.21
June		214.53	134.08
July		216.4	135.25
August		102.82	64.26
September		43.25	27.03
October		27.03	16.89
November		56.15	18.65
December		49.39	14.43
Total		980.93	563.75
Comments			

5. Water Diversion Measurement

a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage	
b. Types of measuring devices used		
Additional technology used		
c. Description of additional technology used		
d. Who installed your measuring device(s)		
e. Make, model number, and last calibration date of		

	your measuring device(s)	
	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	Other
f.	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation, maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost-effective because the value of the local benefits of installing and maintaining meters is not greater than the value of the local cost of implementing that measure. There are no apparent grants available to otherwise cover costs of water meters and related actions. Moreover, the unique hydrogeological characteristics of the Delta (e.g., tides, seepage, interconnected channels, etc.) indicate that meters are not the best available technology in this region. Any water diverted in the Delta which is not consumed or evaporated is recycled to the Delta Pool for reuse. As further support for the conclusion that measuring devices are not locally cost-effective reference is made to the documentation on file with the SWRCB attesting to the lack of such costeffectiveness submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the SWRCB's follow-up solicitation of comments (due November 18, 2011) re the same.
	Method(s) used as an alternative to direct measurement	Crop duty estimates/consumptive use estimates
9.	Explanation of method(s) used as an alternative to direct measurement	Used ITRC REPORT 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for Surface Irrigation, Typical year adjusted for the reporting year using CIMIS monthly ETo for Manteca. For crops not covered by the ITRC report ETc was determined using ratios to alfalfa from Table A-5, DWR Bulletin 168, October 1978.

<b>6. Purpose of Use</b>	
Irrigation	379.6 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
	Are you now employing water conservation efforts?	Yes
a.	Describe any water conservation efforts you have initiated	Good water management and farming practices, pipelines, drip irrigation, , cover crops, mulching, laser leveling. Any diverted water which is not consumed or evaporated is recycled to the Delta Pool. Credit is claimed for these water conservation efforts under section 1011 of the Water Code. A specific amount conserved is not reported due to the lack of a present method to precisely quantify that amount.
	Amount of water conserved	Acre-Feet
b.	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation	
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?
	No
	Amount of reduced diversion
	Type of substitute water supply
b.	Amount of substitute water supply used
	I have data to support the above surface water use reductions due to the use of a substitute water supply

10. Conjunctive Use of Surface Water and Groundwater	
a.	Are you now using groundwater in lieu of surface water?
	No
b.	Amount of groundwater used
	I have data to support the above surface water use reductions due to the use of groundwater.

**11a. Additional Remarks**

The amount diverted is a multiple of the reported use amount, plus a factor to account for field flooding (if any). The multiple is to account for additional water that is diverted but not consumed or evaporated. (Note: add the following insertion to the above insertion if you had multiple PODs deliver water to the same field or parcel): The point of diversion that is the subject of this report is one of   2   (insert number) points of diversion that provided water to an approximate   379.60   acre field/parcel. For purposes of these reports, the amount of acreage irrigated, water used and water diverted associated with each of those points of diversion has been evenly split along them.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Clint
Last Name	Womack
Relation to Water Right	
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S016909  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>	
a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b. Types of measuring devices used	
Additional technology used	
c. Description of additional technology used	
d. Who installed your measuring device (s)	
e. Make, model number, and last calibration date of your measuring device(s)	
f.	Other



Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

**11a. Additional Remarks**

Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S016910  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connected with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

6. Purpose of Use	
Irrigation	945 Acres

7. Changes in Method of Diversion

8. Conservation of Water	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjunctive Use of Surface Water and Groundwater	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

<b>11a. Additional Remarks</b>
Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

<b>Attachments</b>		
File Name	Description	Size
No Attachments		

<b>Contact Information of the Person Submitting the Form</b>	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018405  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connected with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>

<b>8. Conservation of Water</b>	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

**11a. Additional Remarks**

Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes



**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018408  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connected with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

**11a. Additional Remarks**

Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018411  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

6. Purpose of Use	
Irrigation	945 Acres

7. Changes in Method of Diversion	

8. Conservation of Water	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjunctive Use of Surface Water and Groundwater	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

11a. Additional Remarks	
Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.	

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018414  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connected with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
	Amount of reduced diversion	
	Type of substitute water supply	
b.	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>		
a.	Are you now using groundwater in lieu of surface water?	No



b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

**11a. Additional Remarks**

Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018417  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

<b>11a. Additional Remarks</b>
Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

<b>Attachments</b>		
File Name	Description	Size
No Attachments		

<b>Contact Information of the Person Submitting the Form</b>	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018420  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>	

<b>8. Conservation of Water</b>	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

<b>11a. Additional Remarks</b>
Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

<b>Attachments</b>		
File Name	Description	Size
No Attachments		

<b>Contact Information of the Person Submitting the Form</b>	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018423  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>	
a. Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b. Types of measuring devices used	
Additional technology used	
c. Description of additional technology used	
d. Who installed your measuring device (s)	
e. Make, model number, and last calibration date of your measuring device(s)	
f.	Other



Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

<b>6. Purpose of Use</b>	
Irrigation	945 Acres

<b>7. Changes in Method of Diversion</b>

<b>8. Conservation of Water</b>	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

<b>9. Water Quality and Wastewater Reclamation</b>	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

<b>10. Conjunctive Use of Surface Water and Groundwater</b>	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

<b>11a. Additional Remarks</b>
Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

<b>Attachments</b>		
File Name	Description	Size
No Attachments		

<b>Contact Information of the Person Submitting the Form</b>	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

**[SUMMARY OF FINAL SUBMITTED VERSION]**

**SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012**

Primary Owner: Kurt and Sandra Kautz Family Trust  
Statement Number: S018491  
Date Submitted: 2013-06-28

1. Water is used under	Riparian Claim Pre-1914 Claim
2. Year of first use	1875

<b>3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used</b>			
<b>Month</b>	<b>Rate of diversion</b>	<b>Amount directly diverted or collected to storage (Acre-Feet)</b>	<b>Amount beneficially used (Acre-Feet)</b>
January		0	0
February		0	0
March		201.43	125.89
April		374.1	233.82
May		597.36	373.35
June		675.82	422.39
July		355.75	222.34
August		230.59	144.12
September		166.49	104.05
October		130.82	81.76
November		0	0
December		0	0
Total		2732.36	1707.72
Comments			

<b>5. Water Diversion Measurement</b>		
a.	Measurement	Direct measurement using a device listed in Section 1 is "not locally cost effective" for water directly diverted and/or diverted to storage
b.	Types of measuring devices used	
	Additional technology used	
c.	Description of additional technology used	
d.	Who installed your measuring device (s)	
e.	Make, model number, and last calibration date of your measuring device(s)	
f.		Other

Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	The cost of acquisition, installation and maintenance (including vandalism and theft deterrence and remediation), collection and compilation of data from measuring devices is not locally cost effective because the value of the limited benefits to be obtained from these devices (which do not function properly in the conveyance conditions on this property) are limited and do not justify the associated costs. There are no grants available to cover these costs. The unique hydrologic characteristics of the Delta also indicate that meters are not the best available technology in the Delta to measure water use. Water diverted in the Delta that is not consumed is evaporated or recycled into the Delta Pool for reuse. Further support for why measuring devices are not cost-effective in the Delta is found in the documents on file with the SWRCB submitted in connection with the SWRCB's July 21, 2011 "Water Measurement Workshop" and the comments due November 18, 2011.
Method(s) used as an alternative to direct measurement	Other
9. Explanation of method(s) used as an alternative to direct measurement	Use of Cal Poly San Luis Obispo ITRC Report 03-001 ETc Table for Irrigation Scheduling and Design, Zone 12 for surface irrigation, typical year adjusted to the reporting year using CIIMS monthly ETo for the Central and South Delta region.

6. Purpose of Use	
Irrigation	945 Acres

7. Changes in Method of Diversion	

8. Conservation of Water	
a. Are you now employing water conservation efforts?	No
Describe any water conservation efforts you have initiated	
b. Amount of water conserved	Acre-Feet
I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation	
a. Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
Amount of reduced diversion	
Type of substitute water supply	
b. Amount of substitute water supply used	
I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjunctive Use of Surface Water and Groundwater	
a. Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

<b>11a. Additional Remarks</b>
Amounts diverted and used on the ranch cannot be divided between multiple pumps that may operate as points of diversion or redirection at different times. The amounts reported represent all use for Statements 18411, 16910, 18417, 18414, 18408, 18405, 16909, 18420, 18491 and 18423. Report completed based on cropping and irrigation information provided by prior owner.

Attachments		
File Name	Description	Size
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Kurt
Last Name	Kautz
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes