DWR-1212-Rev2 per 7/27/18 and 8/01/18 hearing officer rulings.

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DWR-1212

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

HEARING IN THE MATTER OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND UNITED STATES BUREAU OF RECLAMATION REQUEST FOR A CHANGE IN POINT OF DIVERSION FOR CALIFORNIA WATER FIX	**TESTIMONY OF JOHN BEDNARSKI**

I, John Bednarski, do hereby declare:

I. INTRODUCTION

My name is John Bednarski. I am an expert in the California WaterFix ("CWF") project conceptual engineering design. I am the manager of the Water Supply Initiatives Section at the Metropolitan Water District of Southern California and since 2011, I have participated with the California Department of Water Resources ("DWR") in the conceptual design and overall engineering program management of the CWF. Exhibit DWR-17 was previously submitted in this hearing and remains a true and correct copy of my statement of qualifications.

II. OVERVIEW OF TESTIMONY

My rebuttal testimony describes the refinements to the CWF that are proposed through the Supplemental EIR/EIS process ("Revised Project"), and rebuts testimony presented during the Part 2 hearing relating to tunneling in the Delta, including in the

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vicinity of gas wells and general Delta geology, conceptual design of the tunnel lining system, navigation and traffic impacts, noise impacts, and air quality impacts. This testimony also responds to the Hearing Officers' July 2, 2018 ruling and provides the information requested by Clifton Court LP. The information presented in this testimony is based on a conceptual-level of design (design approximately 10% complete), which will continue to be refined in future engineering phases. However, any future refinements in the preliminary and final designs will utilize the mitigation measures described in previous testimonies (DWR-57 and DWR-75 and DWR-1022) and is not anticipated to result in any effects beyond the scope of the discussion contained in this testimony. The specific areas covered in my testimony include:

- Proposed WaterFix Refinements
- Noise from Impact-Pile Driving
- Air Quality
- Transportation impacts from construction
- Barges and Barge Landings
- Adequacy of Existing Engineering and Field Investigations
- Seismic Design Criteria for Tunnels
- Rebuttal to Nuedeck
- Impacts to Levees
- Response to Clifton Court LP

III. WATERFIX REFINEMENTS

The following paragraphs summarize the refinements that are proposed for the revised CWF and presented as part of the Administrative Draft Supplemental EIR/EIS (SWRCB-113). The public review Supplemental Draft EIR/EIS is expected to be complete by the end of July. The proposed refinements are summarized on DWR- 1303.

A. NORTH TUNNELS

The North Tunnels convey water from the Intakes 2, 3 and 5 to the Intermediate

Forebay ("IF"). Previously, the alignment of these tunnels ran directly underneath the Town of Hood. During the Part 1 hearings, testimony was presented regarding the proximity of this tunnel to the Town of Hood and to the two municipal water wells that serve the town. As part of the refinements described in the Administrative Draft Supplemental EIR/EIS, the alignment would be modified to avoid the town and the municipal wells. (SWRCB-113, p. 3-7, Section 3.2.1.2 Project Component Refinements.) This portion of the tunnel alignment would now run along the eastern limits of the town, and would not cross underneath any residential structures. The alignment change also would move the tunnels further away from the existing municipal water wells.

B. NORTH POWER LINE ALIGNMENT

Instead of creating a new corridor for the project's power lines in the north portion of the Project, the plans now include utilizing an existing SMUD transmission corridor. The existing poles will be upgraded within the existing corridor to accommodate the CWF power needs and will replace existing SMUD power lines in this portion of the project. This will reduce impacts by 1) eliminating the need to construct a second set of power lines, 2) eliminates the need to secure and construct new right of way for the new power lines, and 3) will allow the project to install bird diverting devices on one single set of power lines thereby reducing overall potential for bird strikes. This revision to the project was addressed in the CWF Final EIR Addendum dated January 22, 2018. (DWR-1295.)

C. SNODGRASS SLOUGH BARGE LANDING

The Snodgrass Slough barge landing would be eliminated, and the project would no longer utilize barges to make deliveries to the IF site. Barges were originally envisioned as a way to deliver oversized equipment to this site. This revision will eliminate water traffic related to the project in the waterways of Snodgrass and Georgiana Sloughs as well as the North Mokelumne River. This revision will reduce or eliminate potential recreational and economic impacts.

D. CONSOLIDATE REUSABLE TUNNEL MATERIAL FOOTPRINT NEAR INTERMEDIATE FOREBAY

Previously, Reusable Tunnel Material (RTM) disposal or stockpiling at this location would have been spread out among several sites, including Zacharias Island and several DWR-owned properties that largely consisted of wetlands. This revision will reduce impacts on Stone Lakes Wildlife Refuge by removing RTM from Zacharias Island, 2) remove impacts to wetlands, 3) and reduce truck traffic impacts on surrounding public roads by consolidating all RTM in closely spaced areas near the IF.

E. OPTIMIZE BOULDIN ISLAND ACTIVITIES

This revision would reconfigure the RTM storage locations on Bouldin Island to avoid impacts to wetlands and other sensitive areas. The tunnel alignment under the island would be revised so that the shaft is relocated from a wetlands area to an area that is currently under agricultural use. These combined refinements on Bouldin Island will result in reduced impacts on wetlands. Additionally, in response to feedback from this proceeding, the barge landing location would be moved east, along Potato slough. This revision will reduce potential recreation impact to boaters by placing the new landing in a wider portion of the slough so that water craft can pass with fewer restrictions.

F. MANDEVILLE ISLAND

The tunnel shaft site would be relocated to avoid wetlands and other waters of the United States.

G. BYRON TRACT

This revision would include constructing a new Byron Tract Forebay to serve as a storage facility for the water diverted through the north intakes. The forebay would be located northwest of the existing Clifton Court Forebay in an area that was previously identified as a RTM storage site. The Byron Tract and Clifton Court forebays would be separated by Italian Slough and the forebays would be capable of operating completely independent from one another. The twin main tunnels would terminate just north of the new Byron Tract Forebay. Two pump stations would be constructed at the northeast corner of the forebay, and would lift water from the tunnels into the forebay. The forebay would have an approximate surface area of 820 acres and a total footprint of approximately

1,081 acres.

The addition of the Byron Tract Forebay will eliminate the need to make the modifications to Clifton Court Forebay including those described in the FEIR/S and BiOps. Consequently, temporary and permanent impacts to Clifton Court Forebay and its surroundings are eliminated. The avoided impacts include not needing to remove approximately 8 million cubic yards of dredged material from within Clifton Court Forebay and associated impacts to listed species through this in-water work (DWR-212, Section ES.4.2).

The proposed Byron Tract Forebay development also provides for improved construction and long term operational access to the forebay and pumping plant sites. This revision would also move construction areas and the permanent pumping station away from the community of Kings Island.

By utilizing the Byron Tract Forebay, the project will eliminate the need to modify and expand Clifton Court Forebay, avoid the need to dredge Clifton Court Forebay, avoid the need for in-water construction, avoid the need to acquire property immediately south of Clifton Court Forebay, and avoid the need to relocate 500kV and 230kV transmission lines in the vicinity of Clifton Court Forebay. This revision to build the Byron Tract Forebay in lieu of modifying Clifton Court Forebay significantly reduce wetlands impacts. The power line alignment from the Tracy Substation to the Bryon Tract Forebay Pump Station would be adjusted to follow existing infrastructure routes as well as to parallel new proposed infrastructure footprints resulting in fewer terrestrial impacts.

H. CLIFTON COURT LP

In correspondence to the Board, dated June 21, 2018, a series of questions were raised regarding the potential use of Clifton Court LP ("CCLP") property by the CWF in light of the refinements that are incorporated in the Administrative Draft Supplemental EIR/EIS dated June 12, 2018. The following testimony provides responses to the questions raised.

Due to continued engineering design optimization, the CCLP property would no longer be required for CWF purposes. In regards to the control structure located on the

entrance channel the Jones Pumping Plant Intake Channel, and shown on Mapbook M3-4_BTF1e_v3, a small portion of this facility (less than one acre) was located on CCLP property. Since receiving the letter dated June 21, 2018, DWR has proposed revising the footprint of the control structure, and with this revision (DWR-1306, Volume 3, Sheet 12 of 13) this facility will be entirely located off the CCLP property. Consequently, and to the best of our knowledge, the revised project will not require acquisition of any CCLP property, either in fee title, or for temporary or permanent easements.

The general plan designations shown on the mapbook drawings are determined by local entities, not by DWR. The mapbook drawings referred to in the June 21, 2018, letter reflect the land use designations set forth by Contra Costa County which is responsible for the General Plan in the unincorporated portion of the county. Attached as Exhibit DWR-1307 is a true and correct copy of the General Plan Land Use Element Map for Contract Costa County, which was the source used by DWR.

I. SOUTH TUNNELS AND CANAL

Water would be conveyed from the Byron Tract Forebay to the SWP and CVP by two South Tunnels, each approximately 1.6 miles long. (DWR-1305, Volume 2, Drawings 39 and 55.) The two tunnels would be similar to the main tunnels, each 40-feet in diameter. The tunnels would begin at the southern end of Byron Tract Forebay and end at an outlet structure located south of Byron Highway. At this location, water would be split and would flow via a new open canal to the existing Banks and Jones pumping plant entrance channels. The canal segment between the tunnel outlet structure and the Banks channel would be approximately 2,800 feet long with a maximum capacity of 10,670 cubic feet per second. The canal segment between the outlet structure and the Jones channel would be approximately 4,800 feet long with a maximum capacity of 4,600 cfs.

Two water control structures would also be constructed, one on the California Aqueduct entrance channel to the Banks Pumping Plant, and the second on the entrance channel to the Jones Pumping plant. These control structures would allow flexibility for water diversions to the two pumping plants. For the Banks Pumping plant, the control

structures would allow water to be diverted either from the new Byron Tract Forebay and/or Clifton Court Forebay for State Project diversions. For the Jones Pumping Plant, the control structures would allow water to be diverted either from the new Byron Tract Forebay and/or the existing Delta Mendota Canal for the Central Valley Project diversions.

J. REDUCED IMPACTS TO WETLANDS AND WATERS OF THE UNITED STATES

Many of the revised project refinements discussed above directly reduce CWF impacts to lands classified as wetlands and waters of the United States. The refinements analyzed in the CWF Administrative Draft Supplemental EIR/S include modifications (e.g. Clifton Court being eliminated) that reduce the need to fill or modify lands that are classified as waters of the United States. In other areas along the CWF alignment, refinements to the project reduce impacts on wetlands and waters of the United States found within cultivated lands and tidal channels. Table 12-54 of the Administrative Draft Supplemental EIR/EIS (SWRCB-113) lists both the temporary and permanent impact to these waters at a combined 250 acres. Table 12-55 of the Draft Supplemental EIR/EIS (SWRCB-113) compares the incremental difference between the Approved Project and the Revised Project in so far as impacts to the waters of United States. The Revised Project provides for a net reduction of 448 acres to the waters of the United States when compared to the FEIR/S alignment.

IV. NOISE

DWR has previously disclosed in SWRCB-102, Chapter 23 the anticipated noise levels emanating from pile driving activities at the three CWF intake locations. Mr. Charles Salter, in his written testimony (SCDA-65) claims that the DWR evidence underestimates the actual noise that will be generated by pile driving activities, and implies that DWR has not followed established industry practices for assessing project noise impacts. The data presented by DWR was developed in a manner that is consistent with the Federal Transit Administration (FTA) Guidance Manual 2006. This data was then assessed in accordance with Federal, State and local plans, policies and regulations that pertain to assessing the

impacts and consequences of such noise and vibration levels generated by pile driving. (SWRCB-102, Chapter 23.2 and 23.3.)

DWR has previously disclosed that the findings presented in the FEIR/S are based on a conceptual level design, which includes preliminary information related to the geotechnical setting near the CWF intake locations. (DWR-212, Section 3.3.3.) Without the completed geotechnical studies, DWR was unable to eliminate the potential need for impact-driven piles at the intakes in the FEIR/FEIS. Consequently, and based on the conservative analyses conducted to date, DWR disclosed that the potential noise impacts from pile driving may be significant and unavoidable. The potential reasonable worst-case impacts of pile driving at the intakes for the Approved Project were disclosed by DWR. (SWRCB-102, Chapter 23.3.3.9.)

As part of the project, DWR committed to implementing a noise abatement plan as outlined in SWRCB-111 (Mitigation Monitoring and Reporting Program for the California WaterFix, Mitigation Measure NOI-1a and NOI-1b), which includes among other items using noise-reducing enclosures around noise-generating equipment. Additionally, for the potential pile driving activities, DWR further committed to implement, if feasible, the use of alternative pile driving methods in lieu of impact-driven piles, such as vibratory pile driving, hydraulic press-in pile driving, or use of cast-in place pre-drilled piles. (SWRCB-111, Mitigation Measure NOI-2.) Additionally, DWR disclosed that the proposed mitigation measures NOI-1a and NOI-1b would not be sufficient to reduce pile driving noise levels at the intakes below applicable significance thresholds. DWR concluded that the impacts due to pile driving noise at the intakes would therefore be significant and unavoidable.

Despite the conclusion that potential noise impacts from the impact-driven piles at the intakes are significant and unavoidable, DWR commits to comprehensively evaluate the potential to use non-impact pile driving methods once a comprehensive geotechnical investigation is complete. Through this future assessment, every attempt will be made to avoid impact-driven piles, and therefore avoid the potential significant and unavoidable noise impacts, at the intake locations, as well as other locations along the alignment.

Absent the ability to do this, DWR will continue to implement mitigation measures NOI-1 and NOI-2 to reduce impacts on adjacent communities to extent feasible at each location where pile driving is utilized.

Mr. Salter's written testimony (SCDA-65) claims that unmitigated noise levels from the pile driving at the project intake sites will be disruptive to surrounding communities of Hood and Clarksburg. In his direct examination, Mr. Slater indicated that in his professional judgement, additional actions could be taken by DWR to minimize the potential impacts to the adjacent communities from impact-driven piles but offered nothing specific or additional to what DWR has already committed to do. (Transcript, April 23, 2018, Vol. 32, p. 39:17-24.) DWR has committed to mitigate noise levels from the impact-pile driving, consistent with Mr. Salters's testimony in SWRCB-102 and SWCB-111.

V. AIR QUALITY

DWR acknowledges the comments received from Mr. Philley in SACO-10 that pertain to air quality for the Approved Project. DWR provides the following responses to the specific subjects listed by Mr. Philley in his testimony.

DWR revised its exhaust reduction plan to require that all haul trucks use model year 2010 or newer engines, consistent with Sacramento Metropolitan Air Quality Management District's ("SMAQMD") recommendation presented in this section. (SWRCB-113, p. 3B-4, Appendix 3B, Section 3B.1.9.3 Heavy Duty Haul Trucks.) DWR further revised its exhaust reduction plan to require each contractor to keep written record of equipment usage and for a copy of each unit's certified tier specification to be submitted to CARB and SMAQMD prior to the start of construction. Submission of the engine tier certification will provide documentation of the project's compliance with the exhaust reduction plan and use of Tier 4 off-road equipment.

Mr. Philley's testimony references MM-AQ-1a: Mitigate and Offset Construction-Generated Criteria Pollutant Emissions within the Sacramento Federal Nonattainment Area to Net Zero but does not raise any substantive technical issues. DWR has been, and

continues to coordinate with SMAQMD regarding the availability and cost of offsets as part of the supplemental environmental analysis. SMAQMD is currently in the process of identifying potential emission reduction projects and calculating offset costs for CWF, which DWR will comply with.

In regards to MM-AQ-9: Implement Measures to Reduce Re-Entrained Road dust and Receptor Exposure to PM2.5 and PM10, DWR has proposed a revision to this mitigation measure as part of the Administrative Draft Supplemental EIR/EIS and no longer requires particulate matter monitoring. (SWRCB-113, p. 22-36 to 22-37, Section 22.4.3.2 Proposed Project, Air Quality Resources.) The new measure, Mitigation Measure AQ-6a, requires dust suppressants (Pennzsuppress) be applied on all unpaved surfaces within the construction right-of-way. This measure is sufficient to reduce concentrations below the significant impact level. As such, temporary relocation, paving, and PM monitoring are no longer required to achieve a less-than-significant finding.

In regards to Impact AQ-18: Exposure of Sensitive Receptors to Coccidioides immitis (Valley Fever), Mr. Philley's testimony in this area provides additional statistics on Valley Fever hospitalizations that do not affect DWR's analysis or conclusions reached in the FEIR. Mr. Philley's testimony confirms that the most effective way to prevent Valley Fever is through dust control, as documented in the FEIR. DWR commits to ensure that the requirements of the fugitive dust control plan will be outlined in the solicitation for construction bids, consistent with SMAQMD's recommendation presented in Mr. Philley's testimony. Publicly visible signs will also be posted with the telephone number and person to contact at the lead agency regarding dust complaints, pursuant to the fugitive dust control plan.

VI. TRAFFIC REBUTTAL

Mr. Balaji (San Joaquin County), Mr. Moghissi (Sacramento County) and Mr. Kokkas (Yolo County) in their written testimony (SJC-323, SACO-18 and YOLO-1 respectively) claim that unmitigated construction traffic impacts will be disruptive to surrounding communities in San Joaquin and Yolo Counties. In his direct testimony, Mr. Balaji indicated

that in his professional judgement, actions could be taken by DWR to minimize the potential impacts to San Joaquin County communities from construction traffic and that not enough study segments were evaluated in the EIR. Similarly in his direct testimony, Mr. Kokkas indicated that in his professional judgement, actions could be taken by DWR to minimize the potential impacts to roadway pavement from construction traffic and that not enough analysis was completed to minimize the potential impacts to Yolo County communities. Finally, in his testimony, Mr. Moghissi indicated that, in his professional judgment, the use of "Level of Service" analysis to assess traffic impacts and the use of PCI analysis for pavement condition impacts underestimates the severity of the impacts of the CWF on Delta roadways in Sacramento County.

DWR has previously disclosed in SWRCB-102, Chapter 19 Transportation a comparison of a number of important transportation impacts. The information provided in this Chapter 19 outlines the anticipated magnitude of the most pertinent and quantifiable transportation impacts expected to result from the CWF. Important impacts to consider include impacts on Levels of Service (LOS), exacerbation of unacceptable pavement conditions, disruption of marine traffic due to use of barges for construction, and increased traffic volumes during implementation of restoration measures. For the purposes of the FEIR/FEIS, the construction traffic analysis was completed using a reasonable "worst-case" scenario, whereas all construction truck and employee trips were assigned to the roadway network for each analysis hour even though they would only occur during primarily off-peak time periods. (SWRCB-102, Chapter 19.3.1 [Methods for Analysis].)

The Approved Project would exacerbate traffic conditions on 38 roadway segments, and the Revised Project would exacerbate traffic conditions on 34 roadway segments. This represents a 10.5% decrease when compared to the Approved Project.

As documented in Chapter 19, both the Approved Project and Revised Project, would result in unacceptable level of service conditions on roadway segments in and around the water conveyance facilities construction site. Based on a comparison of the maximum construction project generated traffic, the Approved Project is projected to

generate a maximum of 6,194 vehicle trips in Year 2024 (the 8th year of construction). The Revised Project is projected to generate a maximum of 4,412 vehicle trips in Year 2025 (the 5th year of construction). This corresponds to a maximum project generated trip generation reduction of 1,782 vehicles or 28.8%.

Through the Notice of Preparation and Scoping Process, and before the traffic analysis was conducted, San Joaquin County, Sacramento County and Yolo County were contacted regarding roadways of regional significance that could be affected by WaterFix Project traffic. (SWRCB-102, Appendix 19A, pages 32-33.) The traffic analysis was also conducted using San Joaquin County, Sacramento County and Yolo County approved methodology and level of service standards for roadway and pavement analysis. As documented in Sections 19.1.2.1, 19.1.2.3 and 19.3.1 – Methods of Analysis in the FEIR/FEIS (SWRCB-102; see also SWRCB-102, Appendix 19A, Section 2 [Analysis Approach]), traffic operations of roadway segments were analyzed using procedures and methodologies contained in the *Highway Capacity Manual (HCM),* Transportation Research Board. For roadway pavement, Chapter 610 of the Caltrans Highway Design Manual (2009) provides guidance on pavement engineering considerations including roadway rehabilitation techniques to extend the life of pavement.

The Approved Project would exacerbate unacceptable pavement conditions at 46 locations, whereas the Revised Project would exacerbate pavement conditions at 41 locations. This represents a 10.8% decrease when compared to the Approved Project.

Based on the traffic analysis conducted, DWR has fully disclosed that the traffic impacts from construction traffic may be significant and unavoidable. Prior to construction, the DWR will implement site specific construction management plans (SWRCB-111, TRANS-1a, 1b, and 1c) and limit construction activity on physically deficient roadways (SWRCB-111, TRANS-2a, 2b and 2c) with San Joaquin County, Sacramento County and Yolo County. Where feasible, limit construction activity to fit within available reserve capacity or shift construction activity to hours with more reserve capacity so as to achieve acceptable LOS conditions. When these mitigation measures are undertaken, additional

roadways in San Joaquin County, Sacramento County and Yolo County that could be affected by Approved Project and Revised Project can be analyzed as part of the Traffic Management Plans.

Despite the conclusion that construction traffic impacts at the project site locations are significant and unavoidable, DWR will ensure that prior to commencement of construction activities substantially affecting transportation facilities, DWR will make a good faith effort to enter into mitigation agreements with affected state, regional, or local agencies ("affected agencies") to verify the location, extent, timing, and fair share cost to be paid for reducing congestion to the identified roadway segments impacted by the Approved Project or the Revised Project.

VII. BARGES AND TEMPORARY BARGE LANDINGS

The Approved Project included seven temporary barge unloading facilities to be built on or near the tunnel alignment at riverbank locations about 4-9 miles apart. (SWRCB-102, Chapter 3, Map book Figures M3-4.) Under the Approved Project, temporary barge unloading facilities were planned to be built on the following waterways: Snodgrass Slough, Potato Slough, San Joaquin River, Middle River, Connection Slough, Old River and the West Canal. The proposed refinements to the Approved Project would remove two of these temporary barge landings: West Canal, and Snodgrass Slough. Material and equipment deliveries to the IF site via Snodgrass Slough would be eliminated with the project refinements; hence the Revised Project will not generate barge traffic in the nearby waterways that connect to Snodgrass Slough. The West Canal barge landing would be eliminated, and the new Byron Tract Forebay site would not include construction of a temporary barge landing on the Old River. However, even without a temporary barge landing at this location, barge deliveries of tunnel lining segments to the proposed tunnel shafts near Byron Tract Forebay location will be utilized. It is anticipated that barges will travel to this site via the Old River. Barges will utilize "spuds" to secure mooring locations immediately adjacent to the construction site while segments are being off-loaded.

It is my opinion based on the existing conceptual design and technical work

completed that approximately 9,400 barge trips will be sufficient to deliver the tunnel segments and construction equipment as analyzed in the Biological Opinion. Because of the sequence of environmental analysis that had previously been performed on California WaterFix, the discussion of barge trips sometimes refers to one way barge trips or sometimes does not specify whether the barge trips are counted as one way or round trip. 11,800 trips were presented and analyzed in the FEIR/EIS. (SWRCB-102, p.19-360.) Through the NMFS consultation process, DWR looked at barge capacity and increased the number of tunnel segments on each barge to reduce the number of total trips to the 9,400 presented in the Biological Opinion. The 9400 are one way barge trips and translate into approximately 4,700 round trips, meaning that DWR expects roughly 4,700 delivery trips and 4,700 return trips.

With the proposed reduction to the number of barge landings, it is anticipated that barge traffic for the purposes of delivering tunnel segments and other trips will remain unchanged from that described in the NMFS Biological Opinion for the California WaterFix, Tables 2-33 and 2-34, with the exception that segment deliveries that were previously planned for the Clifton Court Forebay will now be directed to the Byron Tract Forebay site. (SWRCB-106, Section 2.5.1.1.1.2, Barge Traffic.) While there is a discrepancy between the FEIR/S (it states 11,800 barge trips) and NMFS Biological Opinion, the Biological Opinion controls in regards to the maximum number of barge trips and describes 9,400 trips for delivery of tunnel segments (5,500) and other construction equipment (3,900). (SWRCB-106, p. 223; SWRCB-102, p.19-360.) Additionally, the barge routes and timing will be consistent with the information provided in the NMFS Biological Opinion. Thus, the tables in the Biological Opinion (Table 2-33 and Table 2-34) will be relied on by DWR. The FEIR/S analysis is more conservative because it analyzed 11,800[1] barge trips instead of the approximately 9,400 in the NMFS Biological Opinion.

Unfortunately while the remainder of the FEIR/S analysis discussed total numbers of

[1] The number 11,800 described in the FEIR/S mistakenly stated this estimate was for tunnel segment transportation but it includes all barge trips.

barge trips, on page 19-1 and page 19-389, the document also mentions 5,500 barge trips. The second mention correctly clarifies (consistent with the NMFS Biological Opinion) that approximately 5,500 trips would be needed to carry tunnel segments. This did not change the analysis completed in the FEIR/S, nor does it change that a total number of 11,800 barge trips analyzed. This statement merely called out a subset of those trips.

While the Developments After Publication of the Proposed Final Environment Impact Report July 2017 noted that there may be an increase in truck traffic due to the reduction in barge trips, it found: "this barge transportation change would not require disclosure of a new significant impact and no additional mitigation measures would be needed to reduce these additional potential truck traffic effects." (SWRCB-108, p. 105.) However, DWR does not anticipate any additional truck deliveries and there are no redirected impacts stemming from these refinements. In addition, the Administrative Draft Supplemental EIR/ EIS shows reduced impacts from the barge refinements to fish and aquatic resources, land use, and recreation. (SWRCB- 113, Chapters 11, 13, 15.) All of this information will be clarified in the Public Draft Supplemental EIR that will be released later this month.

With the revisions, it is anticipated that project-related barge traffic will potentially pass by two significant highway bridges within the Delta; the Highway 12 Bridge over the Sacramento River at Rio Vista, and the Highway 4 Bridge on Old River. Additionally, it is anticipated that barge traffic moving up the Sacramento River to the intake locations will also pass three additional smaller vehicular bridges at Isleton, Walnut Grove and Paintersville. On Old River, the barges will pass the Orwood Railroad bridge. Depending on the configuration of the barge/tug arrangements at each of these locations, and the water levels in each of these waterways, barges going by these locations may require the opening of these bridges to ensure safe passage to and from project work locations.

Testimony provided by Mr. Chris Kinzel (SCDA-100, pages 1-5) and Mr. Frank Morgan in his oral testimony (Transcript April 23, 2018, Vol 32, pp. 10-22) expressed concerns regarding the potential for barge traffic to require bridge openings that would subsequently cause vehicular traffic delays. DWR acknowledges these potential concerns.

While the exact routing of the barges is unknown at this time, construction contractors will be required to develop detailed barge travel plans as part of DWR overall commitment to mitigate potential traffic impacts. Mitigation Measures Trans-1a, Trans-1b, and Trans 1c (SWRCB-111) envision the need to mitigate potential project-related vehicular traffic issues due to water traffic. When collectively implemented, as planned by DWR, these three measures will ensure that barge traffic and the potential for bridge openings are organized, planned and scheduled in a manner that will minimize impacts to vehicular traffic on Highways 12 and 4. Such actions may include scheduling barge traffic/bridge openings to occur during off-peak vehicular traffic conditions, or during tidal conditions that provide sufficient clearance for barges/tugs to pass under the bridges without requiring that the bridges themselves be opened.

Testimony presented by Mr. Neudeck (SJC-291, pp. 6-9) presents incorrect information related to the CWF's proposed temporary barge landings in the Delta waterways. The dimensions of the temporary barge landings in Mr. Neudeck's testimony are inaccurate. These inaccuracies have led to erroneous conclusions about the impacts from temporary landings on the clear unobstructed channels that are adjacent to the landings. My prior testimony has summarized the basis of DWR's estimated size of the temporary barge landings as 300 feet long, and projecting 50 feet into the waterways. (DWR-1022, p. 5:2-4.) Mr. Neudeck cites as his references for the dimensions of the landings to be CWF YouTube videos. (SJC-291, p. 7:3-5.) These referenced videos do not indicate any dimensions, so it appears that Mr. Nuedeck has "estimated" the size of the landings from the representations made in the videos. From this information, Mr. Neudeck appears to have estimated the temporary barge landings projections into the adjacent waterways. His testimony states that the projection of these barge landings into the adjacent waterways will range from 80 feet to 250 feet. (SJC-291, p. 7:18-26, and p. 8:1-26.) These claims are inaccurate when compared to my cited testimony above.

VIII. ADEQUACY OF EXISTING ENGINEERING AND FIELD STUDIES

In his written testimony, Mr. Tootle identifies himself as the lead geotechnical

designer for a variety of multifaceted projects including earthwork, roadways, bridges, tunnels and levees, among other projects. (SDC-285, p.3:1-8.) Under cross examination, Mr. Tootle did not provide any specific information that pertains to his experience as a geotechnical engineer responsible for large diameter soft-ground tunnels. (Transcript March 16, 2018, Volume 17, pp. 56-59.) In fact, Mr. Tootle states that his experiences with underground construction techniques are limited to micro-tunneling, jack and bore, and cut-cover methodologies. (Transcript March 16, 2018, Volume 17, p. 227:4-6.) ~~However, despite this lack of direct relevant expertise, he has represented himself as an expert on geotechnical matters related to large diameter soft-ground tunnels akin to those planned for the CWF. Mr. Tootle's testimony to the Board offers many unsubstantiated opinions on the adequacy of DWR's current and future field investigations and engineering for the CWF tunnels.~~ While Mr. Tootle contends that DWR has done inadequate levels of work in this area, DWR affirms that the engineering and investigations completed to date for the CWF tunnels are indeed appropriate for the 10% level of design that has been completed for the CWF facilities to date.

Mr. Tootle alleges in his testimony that the work completed to date by DWR is inadequate for approval of an FEIR/S or a Change in Point of Diversion Petition. (SJC-285, p.8:13-15 and March 16, 2018, Volume 17, p.59:17-19.) DWR asserts that there are not official standards for determining if conceptual geotechnical engineering is adequate for an EIR/EIS process. From his testimony, it appears that Mr. Tootle's conclusion is drawn from his experience on past projects. In his testimony, he observed that he has witnessed "voluminous" geotechnical information presented in unspecified CEQA work, when compared to what he claims is an apparent lack of "volume" for the CWF conceptual geotechnical data. (Transcript March 16, 2018, Volume 17, p.104:24.) Once again, DWR alleges that Mr. Tootle has not demonstrated sufficient prior experience that would make him an expert capable of judging the adequacy of conceptual level geotechnical investigations for large diameter soft-ground tunnel projects. DWR affirms that the geotechnical information collected to date is entirely adequate for the purposes of the

FEIR/FEIS and Change in Point of Diversion permit process. To date, DWR has performed over 240 bore hole and cone penetration tests at depths of up to 500 feet for the CWF. (DWR-212, Section 3.3.3.) The subsurface exploration depth varied from 37 feet up to 520 feet below the existing ground surface, with 95 percent of the explorations reaching depths between 100 to 200 feet. The suspension P-S velocity logging method was used to collect compression and shear wave velocities to a maximum depth of approximately 500 feet in five borings located in the northern, central, and southern portions of the various conveyance alignments. The exploratory borings from these investigations are situated primarily along the 2010 tunnel alignment, which is similar to the current CWF alignment except for adjustments made to route the tunnels to the Byron Tract Forebay and through the relocated Bouldin Island shafts and the North Tunnel ventilation shafts.

A selected number of data points from the overall data collected to date, and referenced above, is documented in DWR-1304, figures 4-1 through 4-6. The 25 data locations shown in these figures present a clear picture of the expected Delta geology that is anticipated to be encountered during the tunnel construction for CWF. Interspersed layers of densely packed silts, sands and clays are found along the entire alignment. The percentage of each category varies from location to location, but the general configuration of the deposits and the physical properties remain relatively consistent. This existing geotechnical information has been shared with more than a dozen major American and international tunnel contractors in order to gauge the completeness of this data for the purposes of conceptual design. (DWR-1304, Appendix G.) In all cases, the contractors stated that the currently available information was sufficient to make conceptual-level assessments, conclusions and recommendations.

Mr. Tootle also alleges in his testimony that the work completed to date by DWR is inadequate to commence detailed design. (SJC-285, p. 8:17-21.) Again, Mr. Tootle has not demonstrated his prior experience that would make him an expert capable of judging the level of geotechnical data that is needed to commence preliminary and final design of large diameter soft-ground tunnel projects. Additionally, it appears that Mr. Tootle had not

thoroughly reviewed existing publically available information on this subject. DWR has previously disclosed, in this proceeding and in the Mitigation, Monitoring and Reporting Plan, that extensive future geotechnical investigations and data analysis will take place in the upcoming preliminary design activities. (SWRCB-111, Environmental Commitment: Perform Geotechnical Studies and AMM28: Geotechnical Studies.) While there is no requirement for DWR to conduct these extensive and additional investigations as part of the conceptual engineering phase of the program, DWR is committed to collect extensive additional geotechnical information before construction. In this next phase of work, the spacing of soil boring and test locations will likely average about 1,000 feet along the proposed canal and tunnel alignments, and at approximately 100 to 200 foot increments for other CWF facilities. (SWRCB-111, p. 3-2, lines 28-30, DWR-1304, Section 4.1.3.)

In his verbal testimony, Mr. Tootle contends that ground is highly variable throughout Delta and it would be difficult to predict what type of conditions the tunnels would pass through. (Transcript March 16, 2018, Volume 17, p. 146:1-6.) At the tunnel depths planned, DWR does not consider the ground variable for large diameter TBM. The data collected to date indicates that multiple layers of silts, sands and clays will be encountered at tunnel depths as previously depicted in DWR-212 pages 3-15 to 3-19, and as shown in DWR-1304, figures 4-1 through 4-6. DWR believes that these ground conditions are suitable for pressurized face TBMs, based on our current knowledge and the input received to date from consultants and construction contractors familiar with the project. The TBMs envisioned for the CWF will be of sufficient diameter to effectively excavate multiple layers and types of ground at same time. All of this material will be homogenized in the TBM cutter head, thereby creating ideal conditions for pressurized face TBMs to operate. In some cases, the construction contractors may find it beneficial to add inert or biodegradable additives to the TBM cutterhead to further condition the excavated material so as to ensure a controlled excavation. None of DWR's explorations to date have shown layers of full face of sand, or gravel or clays that would cause issues with tunneling. (DWR-1304, figures 4-1 to 4-6.) At this time, DWR is not anticipating "unexpected changes" in

ground conditions. However, this assumption, based on conceptual-level geotechnical data, will be confirmed with the planned future extensive geotechnical exploration is completed. (SWRCB-111, p. 3-2, lines 28-30.)

In his testimony, Mr. Tootle states that Delta soils are highly variable, contain organic-weak-compressible materials, and can lose strength during seismic loading. (Transcript March 16, 2018, Volume 17, page 211, lines 23-25, and page 212, lines 1-4.) While this condition may be true for some of the near-surface deposits, available data show this is not correct for soil materials at the tunnel depth. Investigations completed to date by DWR indicate that there is little or no organic materials at the proposed depth of the tunnels, and that the ground is actually quite firm (generally stiff to hard fine soils and dense to very dense granular soils) at tunnel depth. (DWR-1304, figures 4-1 to 4-6.) Later in his testimony, Mr. Tootle states that the Delta has a mixture of clays, silts and sands, and that transitioning from one zone to another very rapidly can cause "less than ideal performance". Based on the data DWR has collected thus far, and through discussions with tunnel contractors familiar with the geotechnical data collected, DWR has concluded that there is no indication that these "sudden changes" in geology will be present, or will present difficulties to constructing large diameter tunnels. (DWR-1304, figures 4-1 to 4-6, and DWR-1304, Appendix G.) Once again, these conceptual-level assumptions will be confirmed with more geotechnical exploration as CWF design and construction progresses. (SWRCB-111, Section 3.3.)

IX. SEISMIC ADEQUACY FOR CWF TUNNELS

The conceptual design of the CWF tunnel lining system is described in the Conceptual Engineering Report (CER), Chapters 11 and Appendix I. (DWR-212.) DWR's "current concept" for a segmental tunnel lining system includes a bolted and gasketed precast concrete lining system as shown in DWR-1305 CER Volume 2 Drawings 40-41. The current concept represents a conservative design that includes heavily reinforced segments, and this conservative design is included in the DWR cost estimates for the

tunnels. DWR has also indicated in the CER Chapter 11 and Appendix J that alternatives to this current concept were investigated in conceptual design and will be further investigated in preliminary design of the tunnels. These studies will determine if cost-effective alternatives to the current concept design can be implemented, while ensuring that overall structural and hydraulic performance of the lining system is not compromised. This current concept tunnel lining design was originally based around an anticipated maximum seismic event criteria return period of 975 years (DWR-212, Section 3.4).

In the 2018 CER, DWR undertook a comprehensive review of the original conceptual seismic hazard analysis for the tunnel lining system. This review and assessment of the tunnel liner focused on: 1) assessing the impact of revising the current 975-year return period seismic event criteria for the CWF to the 2,475-year return period on the performance of the tunnel lining system, 2) reviewing currently available geotechnical data along the tunnel alignment for potential liquefaction at tunnel depth, 3) reviewing current industry standards for seismic design of tunnels, and 4) reviewing and assessing additional factors that may contribute to tunnel liner performance in seismic events. The results of this investigation are included in the technical memo contained in Appendix M of the July 2018 CER for the CWF facilities. (DWR-1304.)

In order to evaluate the potential new seismic event criteria on the CWF tunnel lining system, the technical analysis used a conservative approach to compare an alternative tunnel lining system to the current concept. The alternative concept was originally identified in Section 4.0 of Appendix I (DWR-212), and is now shown in Section 4.0 of Appendix J. (DWR-1304.) The significant difference with the alternative concept, when compared to DWR's current concept for a tunnel lining system, is the alternative tunnel approach's lack of high-strength bolting within each ring of segments. Instead of bolting the segments together, the alternative concept relies on push-in guide dowels to hold the tunnel segments in a ring, and to connect adjacent rings to one another. Both the current concept and the alternative concept for tunnel lining systems include a double gasket on all of the segment joints.

To assess the performance of the alternative concept under seismic events, a 3D plain strain numerical model was utilized. The purpose of the modeling was to determine tunnel ring and joint behavior and the impacts to the segment performance when comparing the seismic forces from the original 975-year maximum design event to the 2,475-year design event. The results of this modeling are summarized in Appendix M of DWR-1304.

The 3D modeling completed to date, indicates that the alternative concept will perform in an acceptable manner, in terms of maintaining the tunnel's structural integrity and at the same time avoiding leakage under the 2,475-year event criteria. Therefore, it is concluded that the more conservative/robust design used in DWR's current concept for tunnel lining systems will achieve an even higher level of performance for both structural and leakage integrity under a 2,475-year event. Subsequent to the completion of this analysis, DWR has enhanced the seismic criteria for the tunnels to include the requirement that the tunnels (segments and rings) be designed for the 2,475-year seismic event. This enhanced seismic performance requirement is documented in the DWR-1304, Section 4.2. Cost estimates for the CWF tunnel lining system remain unchanged with this revision to the seismic design criteria since the existing cost estimates already reflect the fabrication and installation costs of the more robust design elements contained in the current concept for the tunnels.

During Part 2, evidence was offered through cross examination of Mr. Tootle that DWR had not followed industry standards when determining the criteria to be used for the tunnel's seismic design criteria. (Transcript March 16,2018, Volume 17, p. 148:20-25, pp. 149-152.) The line of questioning by Ms. Des Jardins implied that the American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7-10, 2010) called out in the FEIR/FEIS (SWRCB-102, Chapter 9, page 9-32 lines 31-41) was the appropriate seismic criteria for the tunnels. The assertions made by Ms. Des Jardins, through questions to Mr. Tootle, are incorrect. This ASCE standard is meant to be applied to above-ground structures, and does not apply to tunnels and other buried structures,

contrary to Mr. Tootle's answers.

In that same section of the FEIR/FEIS, DWR correctly identified the basis of seismic design for the tunnels by citing the applicable design guideline to be the DWR Division of Engineering State Water Project-Seismic Loading Criteria Report, September 2012. (SWRCB-102, Chapter 9, p. 9-35, lines 13-22.) This report identifies the appropriate seismic criteria for the tunnels is a 1,000-year return period event or more, if the potential economic damage or cost of repair for the tunnels is high. DWR-212 utilized this criteria to develop studies, concepts and recommendations that led to the conceptual design of the tunnels that are presented in that document. DWR-212 concluded that the tunnels would perform well in the 975-year return period seismic event. DWR-1304, has concluded that the current concept of the CWF tunnels will also perform well during the 2,475-year return period event, as discussed in the preceding paragraphs.

X. REBUTTAL TO MR. NEUDECK TESTIMONY

~~In his testimony, Mr. Neudeck describes his expertise in the Delta Reclamation Districts/Islands in the areas of flood control, drainage, levee rehabilitation and maintenance, irrigation, financial and project management. (SJC-291.) He does not describe expert knowledge in the areas of tunnels or geology and geotechnical engineering. Consistent with his stated of areas of expertise, he limited his written testimony to these areas of expertise; and under cross examination, Mr. Neudeck admitted that he was not a tunnel expert.~~ (Transcript March 15, 2018, Volume 16, p. 68:12.) However, later in his testimony under cross examination, Mr. Neudeck offered numerous opinions on the subjects of tunnels, tunnel construction, and geology, upon which he has no expert knowledge. The following paragraphs provide some specific examples of subject matter that Mr. Neudeck offered an opinion, but has no expert knowledge. All of this testimony took place on March 15, 2018 and is captured in Volume 16 of the board hearing transcripts.

During his testimony on this date, Mr. Nuedeck claimed that tunnels the size of those proposed by DWR have not been completed anywhere in the world before. (Transcript

March 15, 2018, Volume 16, page 66, lines 7-12.) This statement is false. My prior testimony in DWR-6, page 6 and DWR-75 pages 3-9, documented numerous large diameter tunnels that have been successfully completed in soft, saturated ground conditions that are similar to those anticipated along the CWF tunnel alignment.

Mr. Neudeck stated that the tunnels pass through gas fields, and this will potentially create problems for tunneling. (Transcript March 15, 2018, Volume 16, page 66, lines 13-15.) This statement is misleading. Although it is true there are gas fields located in areas in the Delta, the tunnels themselves will be passing approximately 1,000-2,000 feet above the active and inactive gas fields. Geotechnical data collected shows no indication that there is actually gas deposits at the depth that the CWF tunnels will be constructed (100 to 150 feet below ground surface). Additionally, during conceptual design, DWR documented the location of known active and inactive gas wells along the tunnel alignment utilizing publicly available information including the Division of Oil, Gas and Geothermal Resources (DOGGR) reports. (DWR-1304, figure 13-1.) The current tunnel alignments avoid all active gas wells. The location of the abandoned wells, some of which were abandoned many decades ago, is less obvious. Some abandoned wells show up on historical photos of the Delta, some do not. To address this challenge, DWR will conduct specialized studies and work activities to locate and remove any abandoned wells that are in the tunnel alignment. Additionally, DWR may potentially require tunnel contractors to install equipment on the tunnel boring machines to detect buried metallic objects directly in front of the TBMs. With this multi-phase approach in effect, DWR anticipates that tunnel construction in the Delta gas well environment can be conducted in a safe and efficient manner.

During his testimony, Mr. Neudeck was asked a series of technical questions related to TBM operations and DWR's settlement monitoring program that is outlined in SWRCB-111 pdf page 166. (Transcript March 15, 2018, Volume 16, p. 72.) He had previously stated that he had no expertise in this area, yet despite this lack of tunnel expertise, he continued to provide his opinion on a wide range of tunnel-specific subjects including the

adequacy of DWR's existing current plans for a settlement monitoring program.

In his written and verbal testimony, Mr. Neudeck provided no evidence that he has participated in developing a settlement monitoring program for a tunnel project. Despite this lack of expert knowledge, Mr. Neudeck testified that he is concerned that a "prescriptive specification" for settlement monitoring has not been developed by DWR as part of the conceptual engineering completed to date. (Transcript March 15, 2018, Volume 16, p. 79:3-5.) A settlement monitoring program is not required in conceptual design. However, DWR has committed to monitoring settlement along alignment to ensure that uncontrolled face loss does not lead to excessive settlement along the tunnel alignment. (SWRCB-111, p. 3-4 to 3-6.) The details of this program will be developed during the preliminary and final design stages for the tunnels and after the completion of detailed geotechnical investigations. DWR represents that preliminary and final design is the appropriate time to develop the detailed settlement specifications, not during the conceptual engineering phase of the program, which is the current state of engineering on the CWF.

Finally, Mr. Neudeck mischaracterizes the ability of TBMs to operate in high ground water conditions, once again demonstrating his lack of knowledge on this subject. Under cross examination, Mr. Neudeck offered his opinions about the risks of tunneling in high water conditions. (Transcript March 15, 2018 Volume 32, p. 81:8-13.) He continued under cross examination by agreeing with the examiner that CWF tunneling should be suspended during high water conditions. (Id., p. 81:14-20.) The opinions expressed by Mr. Nuedeck in both of these areas are completely erroneous. The pressurized face TBMs that are proposed for the CWF tunnels are specifically designed to operate when the ground conditions are fully saturated (water at or above ground surface), and during conditions when the TBM has to pass under open bodies of water while mining in soil. Examples of successful TBM experiences under these very conditions were presented in my earlier testimony (DWR-75), with specific examples being the Eurasia Tunnel (page 5 lines 8-21), the Port of Miami Tunnel (page 6, lines 7-19), and the Bay Tunnel (page 7 lines 22-28 and

page 8 lines 1-7).

XI. IMPACTS TO LEVEES

Testimony before this Board has suggested that the CWF activities will have significant impacts on the existing Delta levees, including levee stability, levee maintenance, levee drainage, and waterway navigation near the levees. SJC witness Mr. Neudeck states that CWF activities will impact all of these areas. (SJC-291.) Mr. Neudeck's testimony claims that CWF activities will have significant impacts on operation and maintenance of the levees and will cause settlement of the levees. (SJC-291, p. 5:9-26, and p. 6:1-13.) There are multiple shortcomings with Mr. Neudeck's testimony, including: 1) he did not provide any engineering analyses to substantiate his claims, 2) he did not review or provide contradictory evidence to DWR's prior testimony that is directly related to these subjects, and 3) he admitted under cross examination, that he did not review DWR's mitigation measures related to these subjects. (Transcript March 15, 2018, Vol. 16, p. 9:5-9.) In summary, Mr. Neudeck's written and verbal testimony demonstrates that he is not familiar with how the Delta levees will be utilized for the CWF, or how DWR has committed to safeguarding the levees during CWF construction.

During the course of these hearings, my testimonies (DWR-57 and DWR-75) have repeatedly presented information related to DWR's understanding of the current conditions of the levees, described the anticipated use of the levees for the purposes of construction haul roads, and identified precautions and mitigations that will be implemented to protect the levees during construction. DWR-57 (pages 26, lines 13-28) clearly describes DWRs approach to utilizing levee roads, the assessment of levees to carry construction traffic, and the precautions that will be implemented on an as-needed basis to protect and monitor the levees. DWR-75, page 16, line 28, and page 17, lines 1-17, outlined DWR's anticipated use of levee roads, and the commitments to investigate the existing conditions of the roads, avoid the use of deficient sections of levee roads, make improvements to levee roads as necessary, and return roadways to preconstruction condition or better upon the completion of CWF construction activities. To the extent possible, CWF construction traffic will be kept

off the levees that are not highway rated, and approximately 6 miles of levee roads (excluding SR-160) were identified for use for construction site access. (DWR-75, p.17:1-3.)

In his testimony, Mr. Nuedeck states that there has been a general lack of contact between the CWF project team and the Reclamation districts that he represents in relation to the planning for the CWF facilities. (Transcript April 15, 2018, Volume 16, pp 148-150.) In his testimony Mr. Neudeck recommends that DWR reach out to potentially impacted Reclamation Districts "sooner, rather than later". (Transcript April 15, 2018, Volume 16, p.160:17-18.) Due to the conceptual nature of the CWF engineering plans to date, DWR has not conducted extensive discussions with the Reclamation Districts.

However, DWR has recently undertaken development of a detailed set of plans and specifications for a site preparation contract on Bouldin Island and detailed interactions with Reclamation District 756 have commenced. In the course of this detailed work, which has included geotechnical investigations and engineering design, DWR has engaged with Reclamation District 756 on Bouldin Island to get input from the Reclamation District engineers as that input might pertain to the project's plans and specifications. (DWR-1308.) This design work is now 99% complete, and will not be advertised for construction bids until all applicable permits and legal approvals are obtained. The current set of plans and specifications include input from the Reclamation District 751 in a variety of areas including potential impacts to levees and island drainage courses. (DWR-1309.) Specifically, one of the requirements set forth by Reclamation District 756 for this site preparation contract on Bouldin Island is that DWR obtain an encroachment permit for any work with the potential to affect the District. (DWR1310.) During this collaborative design development process with the reclamation district, meetings were held with the reclamation district engineers to get their review and feedback of plans and specifications prior to the finalization of the construction contract bidding documents. DWR is committed to replicating this proactive approach with other Reclamation Districts in the Delta as work on CWF investigations and designs commence.

DWR-1212-Rev2 per 7/27/18 and 8/01/18 hearing officer rulings.

Executed on this 10 day of July, 2018 in Los Angeles, California.

John Bednarski