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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 BDCP/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 (MWD) 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.

In October 2015, DWR and U.S. Bureau of Reclamation (Reclamation) (jointly Petitioners) petitioned the State Water Board for the addition of three new points of diversion on Petitioners' water rights permits. In testimony submitted in Part 1 of this hearing, the project was described as Alternative 4A with initial operational criteria that would fall within a range of operations described as H3 to H4. These operational criteria

were described in the Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS). For purposes of Part 2 of the hearing, including this testimony, the CWF project is described by Alternative 4A under an operational scenario described as H3+ that is set forth in the Final Environmental Impact Report/Environmental Impact Statement and supplemental information adopted by DWR through the issuance of a Notice of Determination in July 2017 (2017 Certified FEIR). **The adopted project is referred to as CWF H3+.** Additional information is also referenced in this testimony from documents released prior to July 2017, including the Alternative 4A described in the Final Environmental Impact Report/Environmental Impact Statement, Biological Assessment and the Biological Opinions, referred to herein as the FEIR/FEIS, BA and the BO respectively. Similarly, after July 2017 the California Department of Fish and Wildlife issued a 2081(b) Incidental Take Permit, which is referred to as the ITP. The interrelationship and use of these terms is further described in the testimony of Ms. Buchholz, DWR-1010.

This testimony addresses potential impacts to navigation from construction of intake structures on the Sacramento River, Head of Old River Gate (HORG), barge unloading facilities, and barge traffic, and feasibility of constructing the proposed fish protection systems (fish screened intakes). The information presented in this testimony is based on a conceptual-level of design, which will continue to be refined in future engineering phases. However, any future refinements in preliminary and final design will utilize the mitigation measures described in previous testimonies (DWR-57 and DWR-75) and is not anticipated to result in any effects beyond the scope of the discussion contained in this testimony.

II. OVERVIEW OF TESTIMONY

The CWF consists of five key features: three intakes located in the North Delta, tunnels, forebays (Intermediate and Clifton Court), a pumping plant, and an operable gate at the HORG. Each feature is described in my previous testimony (DWR-57).

Construction activities with potential to impact navigation in the Sacramento - San Joaquin Delta waterways and the feasibility of constructing the proposed fish screened intakes along with a summary of successfully constructed intakes on the Sacramento River are described in this testimony. Potential impacts to navigation include narrowing of river channels due to construction of cofferdams at the intake and HORG sites and temporary barge unloading facilities, and increased barge traffic that would be needed to move construction materials and equipment. Measures to mitigate potential impacts to navigation are also described.

III. POTENTIAL IMPACTS TO NAVIGATION

i. Intakes

To allow for construction of intakes, cofferdams would be constructed within the river channel. The cofferdams would vary in size according to intake location, but would range from 740 to 2,440 feet in length and would extend into the river channel up to 85 feet, depending on location. The proposed cofferdams' construction method and their encroachment into the river channel would be similar to the method and encroachment used for the construction of Freeport intake on the Sacramento River. Although boats would be unable to use the portion of the waterway where the cofferdam is placed, the river in the vicinity of the intake construction sites would remain open to boat passage at all times. The river is approximately 500– 700 feet wide near the proposed intakes, which would leave most of the channel width (approximately 380–580 feet) open to boat passage, providing ample room for the boat traffic observed to occur in the area to pass without difficulty and minimizing possible traffic congestion. (Exhibit SWRCB-102, Section 15.3.3.9, pp. 15-270 – 15-271.)

Temporary in-water construction zone restrictions would be in place. These measures would include a speed-restricted zone extending upstream and downstream of river construction areas to reduce wake and maintain a safe work area in the vicinity of the construction activities. To minimize potential impacts to navigation, site-specific safety

features, including determination of the speed-restriction zone would be developed under the Mitigation Measure TRANS-1a. (SWRCB-102, Sections 15.3.3.9, p.275 and 19.3.3.9, pp.19-218 – 19-221.) Mitigation Measure TRANS-1a also involves providing notification of construction activities in waterways to require information about construction site location(s), construction schedules, and identification of no-wake zone and/or detours is posted at Delta marinas and public launch ramps. (Id.) Recreational boat passage volume along the corridor of the Sacramento River where intakes are proposed is low. (Exhibit SWRCB-102, Section 15.3.39, pp. 15-270 – 15-275.) Although there is sufficient width in the channel to allow boat passage, boaters could experience minor travel delays related to construction speed zones similar to that experienced near the many existing "no wake" zones in the Delta. (Id.)

ii. Barges and Temporary Barge Unloading Facilities

Construction of the CWF water conveyance facilities would require the use of barges in water, often to hold construction equipment, such as cranes, and to transfer equipment and materials to and from construction sites. Construction would take place in phases, and the number and duration of barge usage would vary by location. (Exhibit SWRCB-102, Section 15.3.3.9, pp. 15-272 – 15-275.) The majority of barge-related transportation would be used to carry precast tunnel segment liners to temporary barge unloading facilities closest to the launch shafts. The proposed CWF includes seven barge unloading facilities to be built on or near the tunnel alignment at riverbank locations about 4–9 miles apart. (Exhibit SWRCB-102, Chapter 3, Mapbook Figures M3-4.) Temporary barge unloading facilities would be built on the following waterways: Snodgrass Slough, Potato Slough, San Joaquin River, Middle River, Connection Slough, Old River, and the West Canal. These barge unloading facility locations are approximate; precise siting and dimensions of these facilities are to be determined by construction contractors. Loading and offloading construction equipment and materials from barges in the Delta can be accomplished by pushing ramp barges up against levees and unloading directly onto the levee or by using

decks supported on pipe piles on the water side. (Exhibit DWR-212, Section 23.3, pp. 23-2 – 23-3.) To disclose the maximum impacts, the worst-case scenario of building decks approximately 300-ft by 50-ft, supported on piles was assumed. (Exhibit SWRCB-104, Section 3.2.10.9, pp. 3-76 – 3-78.) The temporary barge unloading facilities would be removed after construction is completed.

Use of barges for proposed facilities construction and construction of the temporary barge unloading facilities may require partial channel closures and use of equipment within the waterways. Temporary in-water construction zone restrictions would be put in place around barges and barge facilities, including a speed-restricted zone extending upstream and downstream of construction within the waterway to reduce wake and maintain a safe work area in the vicinity of the construction activities. To minimize potential impacts to navigation, site-specific safety features, including determination of the speed-restriction zone, and notification procedures would be developed under the Mitigation Measure TRANS-1a. (SWRCB-102, Section 19.3.3.9, pp. 19-218 – 19-221.)

Approximately 5,900 barge trips will carry tunnel segment liners from ports (locations not yet determined, but likely in the Sacramento-San Joaquin Delta and San Francisco Bay area) to barge unloading facilities via the Sacramento River, averaging approximately four round trips per day for up to 5.5 years. Because barges may also be used for other purposes, such as transportation of bulk materials, a total of 9,400 barge trips may be used. (Exhibit SWRCB-107, p. 41.) This is a small increase relative to the existing Marine traffic in the Delta. (Exhibit SWRCB-104, Section 3.2.10.9, pp. 3-76 – 3-78.) Barges used will be commercial vessels propelled by tugboats. Barge sizes have not been determined. All barge operations will be required to comply with the provisions of a barge operations plan, as specified in Appendix 3.F General Avoidance and Minimization Measures, AMM7 Barge Operations Plan (Exhibit SWRCB-104, Section 3.2.10.9 and Appendix 3F) and will be subject to review and approval by DWR and the other resource agencies (California Department of Fish and Wildlife, National Marine Fisheries Service, and US Fish and Wildlife Service included).

iii. Head of Old River Gate

There are two potential methods of constructing the Head of Old River Gate (HORG): (1) Cofferdam construction in a dewatered construction area; and (2) In-the-Wet construction, which eliminates the time, material, and cost of constructing a cofferdam. (Exhibit DWR-212, Section 17.2, p. 17-1.) To disclose the most impactful scenario for construction related impacts, gate construction method using cofferdam was assumed. HORG Construction will occur in two phases. The first phase will include construction of half of the gate, masonry control building, operator's building, and boat lock. The first construction phase involves installing a cofferdam in half of the river channel. The cofferdam will remain in the water until the completion of half of the gate. The cofferdam will then be flooded, and removed or cut off at the required invert depth, and another cofferdam installed in the other half of the channel. In the second phase, the gate will be constructed using the same methods, with the cofferdam either removed or cut off. (Exhibit SWRCB-104, Section 3.2.8.2.2, pp. 3-68 – 3-69.) During both phases of construction, at least half of the river channel will be open to navigation. All in-water work, including the construction of cofferdams, sheet-pile walls and pile foundations, and placing rock bedding and stone slope protection, will occur during the proposed in-water work window of August 1 through October 31 to minimize effects on fish. (Exhibit SWRCB-104, Table 3.2-2, pp. 3-28 – 3-29.) Once the construction is complete, the newly constructed boat lock as part of the gate will be available for boats to cross the gate when it is closed.

The HORG construction site has for many years been used for seasonal construction and removal of a temporary rock barrier, and all proposed work for the HORG will occur within the area that is currently seasonally disturbed for temporary rock barrier construction. The temporary rock barrier serves as a fish barrier primarily to benefit migrating San Joaquin River Chinook salmon and has been constructed most years since 1963 between September 15 and November 30. This temporary rock barrier has also been installed during the Spring in some years. Since the temporary rock barrier does not include a boat passage, when this rock barrier is in operation, navigation through this site is

blocked. However, the proposed HORG construction would keep at least half of the channel opens to navigation during construction and the boat lock that is proposed as part of the HORG will be used for navigation during the gate operation, an improvement upon the current temporary rock barrier. Therefore, the potential impacts to navigation from construction and operation of the proposed HORG will be significantly less compared to the existing conditions.

IV. FEASIBILITY OF CONSTRUCTING THE PROPOSED FISH SCREENS

DWR proposes to construct three intake facilities on the east bank of the Sacramento River (identified as intakes No. 2, 3, and 5 in Exhibit DWR-213), each with a maximum diversion capacity of 3,000 cubic feet per second (cfs). The 3,000 cfs diversion capacity of each of the proposed intake facilities, their locations, and the "on bank" design were selected based on recommendations from and consultation with the Fish Facilities Technical Team. The Fish Facilities Technical Team was made up of fisheries experts (biologists and engineers) from several State and Federal agencies (U.S. Fish and Wildlife Service, NOAA National Marine Fisheries Service, California Department of Fish and Wildlife, DWR and its consultants, and US Bureau of Reclamation). (Exhibit SWRCB-102, Appendix 3F-Intake Location Analysis.)

Exhibit DWR-215 illustrates the intake facilities, which consist of fish screens, sedimentation basins, isolation gates, flow control gates, sediment drying lagoons, and electrical power/control equipment. Each of the proposed three sites will vary slightly in terms of bathymetric conditions and design river levels. All of the intakes are sized to provide approach velocities of less than or equal to 0.20 feet per second (fps) at an intake flow rate of 3,000 cfs at the design water surface elevation. The design water surface elevation for each site was established at 99 percent exceedance (Sacramento River stage) elevation. (Exhibit DWR-212, Section 6.1.1.1, pp. 6-4 – 6-6-7.)

The three intakes facilities will be on-bank structures with state of the art fish screens that are similar to the following existing facilities on the Sacramento River:

- Red Bluff Intake: This intake is located on the Sacramento River in Red Bluff and owned by US Bureau of Reclamation. The intake facility consists of on-bank flat plate fish screens with maximum diversion capacity of 2,500 cfs, and began delivering water in May 2012. Exhibit DWR-1051 shows the completed intake facility.
- Freeport Intake: This intake is located on the Sacramento River, upstream of town of Freeport and is owned by Freeport Regional Water Authority. The on-bank intake consists of flat plate fish screens with maximum diversion capacity of 290 cfs, and was complete in March 2010. Exhibit DWR-1051 shows the completed intake facility.
- Glenn-Colusa Irrigation District Intake: This intake is owned and operated by Glenn-Colusa Irrigation District and is located on an oxbow off the main stem of the Sacramento River in Hamilton City, approximately 100 miles north of Sacramento. The intake consists of flat plate fish screens with maximum diversion capacity of 3,000 cfs. Construction of the fish screen facility was completed in two phases in 1993 and 2000. Exhibit DWR-1051 shows the completed fish screen facility.

Based on the comparison to the successfully completed intake projects on the Sacramento River summarized above and the engineering completed (Exhibit DWR-212, Section 6), the CWF intakes do not pose any special or unusual challenges that would hinder similar successful completion. As part of next engineering phase, extensive collaborative discussions with the State and federal fish agencies will continue and variety of preconstruction studies are proposed to aid in refinement of the fish screen design. A listing and description of these studies are included in Exhibit SWRCB-104 Section 3.4.7, pp. 3-203 – 3-214, and are also discussed in Dr. Greenwood's testimony (Exhibit DWR-1012).

Executed on this 28th day of November, 2017 in Sacramento, California.

(John Bednarski)