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BEFORE THE
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

HEARING ON 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.

**SUR-REBUTTAL TESTIMONY OF
SUSAN PAULSEN, Ph.D., P.E.**

BACKGROUND AND QUALIFICATIONS

My name is Susan Paulsen and I am a Registered Professional Civil Engineer in the State of California (License # 66554). My educational background includes a Bachelor of Science in Civil Engineering with Honors from Stanford University (1991), a

1 Master of Science in Civil Engineering from the California Institute of Technology
2 (Caltech) (1993), and a Doctor of Philosophy (Ph.D.) in Environmental Engineering
3 Science, also from Caltech (1997). My education included coursework at both
4 undergraduate and graduate levels on fluid mechanics, aquatic chemistry, surface and
5 groundwater flows, and hydrology, and I served as a teaching assistant for courses in
6 fluid mechanics and hydrologic transport processes.

7 I currently am a Principal and Director of the Environmental and Earth Sciences
8 practice of Exponent, Inc. (Exponent). Prior to that, I was employed by Flow Science
9 Incorporated, in Pasadena, California, where I worked for 20 years, first as a consultant
10 (1994-1997), and then as an employee in various positions, including President
11 (1997-2014). I have 25 years of experience with projects involving hydrology,
12 hydrogeology, hydrodynamics, aquatic chemistry, and the environmental fate of a range
13 of constituents.

14 My Ph.D. thesis was entitled, "A Study of the Mixing of Natural Flows Using
15 ICP-MS and the Elemental Composition of Waters," and the major part of my Ph.D.
16 research involved a study of the mixing of waters in the Sacramento-San Joaquin Bay-
17 Delta (the "Delta") using source water fingerprints. I also directed model studies to use
18 chemical source fingerprinting to validate the volumetric fingerprinting simulations using
19 Delta models (including the Fischer Delta Model (FDM) and the Delta Simulation Model
20 (DSM)). I have designed and directed numerous field studies within the Delta using both
21 elemental and dye tracers, and I have designed and directed numerous surface water
22 modeling studies within the Delta.

23 For my testimony in this matter, I am familiar with and knowledgeable about the
24 City of Stockton's ("Stockton" or "City") water rights, water operations, and water
25 diversion.

26 A copy of my curriculum *vitae* is included as Appendix A to the Report on the
27 Effects of the California WaterFix Project on the City of Stockton in Exhibit STKN-026.
28 ///

TESTIMONY

I was retained by Stockton to assist the City in its evaluation of the California WaterFix Project (“WaterFix” or “Project”). My testimony responds to assertions made by Petitioners Department of Water Resources (DWR) and U.S. Bureau of Reclamation in their rebuttal testimony and exhibits in the State Water Resources Control Board (SWRCB) proceedings on the WaterFix Water Rights Change Petition (Petition), as well as statements and evidence included in the WaterFix Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) regarding the Project’s effect on Stockton as a legal user of water, and more specifically on the Project’s impacts on the City’s municipal water supply derived from its intake on the San Joaquin River. My testimony includes comments on the changes in hydrodynamics and water quality that are expected to occur in the Delta after implementation of the Project, and to rebut Petitioners’ assertions that the Project will not have an impact on the supply and quality of water available to Stockton, which uses fresh water from the Delta for potable municipal supply. My testimony presents five (5) primary opinions in sur-rebuttal to Petitioner’s rebuttal testimony and exhibits:

- Opinion 1: DWR’s representation of hydrodynamics and velocity in the Delta misses key features of Delta flows and leads to unsupported conclusions regarding water quality impacts to Stockton.

- Opinion 2: DWR’s opinions regarding salinity impacts at the location of Stockton’s intake are incomplete and misleading. Exponent’s analysis of DWR’s modeling shows that the Project will have significant impacts to salinity at the City’s intake location.

- Opinion 3: The information provided by DWR regarding bromide is insufficient to determine impacts to Stockton but indicates that bromide concentrations will increase.

- Opinion 4: The information provided by DWR regarding organic carbon is insufficient to determine impacts at Stockton’s intake location but indicates that organic

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carbon concentrations will increase.


- Opinion 5: DWR's conclusions that the Project will not impact the frequency or magnitude of Microcystis blooms in the future are unfounded. Our analysis indicates that the Project will increase the likelihood of Microcystis blooms in the future.

I am the principal author of the report submitted as Stockton's exhibit STKN-048 along with this testimony.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this 9th day of June 2017 in Pasadena, California.

EXPONENT, INC.

By 
Dr. Susan Paulsen, Ph.D., P.E.