ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, ZONE 7
ALAMEDA COUNTY WATER DISTRICT
COACHELLA VALLEY WATER DISTRICT
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
SANTA CLARA VALLEY WATER DISTRICT
TULARE LAKE BASIN WATER STORAGE DISTRICT
SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
WESTLANDS WATER DISTRICT

See List of Counsel for Water Agencies in Attachment 1

CALIFORNIA REGIONAL WATER
MAR 12 2012
QUALITY CONTROL BOARD

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Public Water Agencies' Petition for Review of Action and Failure to Act by Regional Water Quality Control Board, San Francisco Bay Region, in Adopting Waste Discharge Requirements Order No. R2-2012-0017 (NPDES No. CA0037699) for Vallejo Sanitation and Flood Control District Treatment Plant.

SWRCB/OCC File No. _____

PETITION FOR REVIEW AND STATEMENT OF POINTS AND AUTHORITIES (Water Code § 13320)

The California Water Code declares:

> No discharge of waste into the waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to continue the discharge. All discharges of waste into waters of the state are privileges, not rights.

(Water Code § 13263(g).) And the California Constitution declares:

> It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.

(Cal. Const., Art. X, § 2.)

Petitioners the Alameda County Flood Control and Water Conservation District, Zone 7, Alameda County Water District, the Coachella Valley Water District, the Metropolitan Water District of Southern California, the Santa Clara Valley Water District, the Tulare Lake Basin

Water Storage District, the San Luis & Delta-Mendota Water Authority, and the Westlands Water District (collectively "Petitioners" or "Public Water Agencies"), in accordance with section 13320 of the Water Code and sections 2050 *et seq.* of Title 23 of the California Code of Regulations, hereby petition the State Water Resources Control Board ("State Water Board") for review of Waste Discharge Requirements Order No. R2-2012-0017 (NPDES No. CA0037699) of the San Francisco Bay Regional Water Quality Control Board ("Regional Water Board") and action or inaction of the Regional Board associated therewith.

I.

PETITION FOR REVIEW

1. NAME, ADDRESS, TELEPHONE NUMBER, AND EMAIL ADDRESS OF THE PETITIONERS

Petitioners' contact information is as follows:

Alameda County Flood Control and Water Conservation District, Zone 7 ("Zone 7")
c/o Jill Duerig
100 North Canyons Parkway
Livermore, CA 94551
Telephone: (925) 454-5000

Please send all Zone 7 correspondence to:

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Alameda County Water District ("ACWD")
c/o Doug Chun
43885 South Grimmer Boulevard
Fremont, CA 94538
Telephone: (510) 688-4200

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Please send al ACWD correspondence to:

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Coachella Valley Water District ("CVWD")
c/o Steve Robbins
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Metropolitan Water District of Southern California ("MWD")
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Please send all MWD correspondence to:

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Santa Clara Valley Water District ("SCVWD")
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Please send all SCVWD correspondence to:

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Tulare Lake Basin Water Storage District ("TLBWSD")
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San Luis & Delta-Mendota Water Authority ("SLDMWA")
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Please send all SLDMWA correspondence to:

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Westlands Water District ("WWD")
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Please send all WWD correspondence to:

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2. THE SPECIFIC ACTION OR INACTION OF THE REGIONAL BOARD WHICH PETITIONERS REQUEST THAT THE STATE WATER BOARD REVIEW

The Public Water Agencies petition the State Water Board to review the Regional Water Board's adoption of Order No. R2-2012-0017 (NPDES No. CA0037699), Waste Discharge Requirements for the Vallejo Sanitation and Flood Control District Treatment Plant ("Permit"), and action or inaction related thereto, as more fully described herein. A true and correct copy of the Permit is attached hereto as Exhibit A.

3. THE DATE ON WHICH THE REGIONAL WATER BOARD ACTED OR REFUSED TO ACT

The date on which the Regional Water Board acted or refused to act is February 8, 2012.

4. A STATEMENT OF THE REASONS THE ACTION OR FAILURE TO ACT WAS INAPPROPRIATE OR IMPROPER

A full and complete statement of the reasons why the Regional Water Board's actions were inappropriate or improper is provided in the accompanying Statement of Points and Authorities, which is incorporated herein by this reference.

5. THE MANNER IN WHICH PETITIONERS ARE AGGRIEVED

The Public Water Agencies are aggrieved by the actions or inactions of the Regional Water Board because they and the families, farmers, workplaces and other customers in their service areas will continue suffering harm from disruption of State Water Project ("SWP") and federal Central Valley Project ("CVP") water supply availability due to the degradation of receiving water quality by the discharge of ammonium and other wastes from Vallejo Sanitation and Flood Control District's ("Discharger") Treatment Plant. The discharge of ammonium and

other wastes from the Discharger's Treatment Plant into portions of California's San Francisco Bay/Sacramento-San Joaquin River Delta Estuary ("Bay-Delta Estuary" or "Bay-Delta")—including Mare Island Strait, Carquinez Strait and thence into Suisun Bay and San Pablo Bay—harms aquatic life, including phytoplankton, zooplankton, Delta smelt and longfin smelt. Delta smelt and longfin smelt are protected under the federal Endangered Species Act ("ESA") and/or the California Endangered Species Act ("CESA"). Regulations enforced to protect those species, as well as other species that depend upon the Bay-Delta Estuary, have caused severe restrictions on the availability of SWP and CVP water for delivery to the Public Water Agencies for use on millions of acres of prime farmland and by more than 25 million Californians living in two-thirds of the state's households from the greater San Francisco Bay Area to San Diego.

6. THE SPECIFIC ACTION REQUESTED BY PETITIONER

The Public Water Agencies request that the State Water Board review the record, the Permit (including its findings), and this Petition, and that the State Water Board issue an order or orders accomplishing all of the following:

Vacate and revise the requirements of the Permit (as discussed below in the Statement of Points and Authorities), and make related, consistent, and conforming revisions. The revised Permit requirements requested by Petitioners are set forth in Exhibit B to this Petition.

7. A STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL ISSUES RAISED IN THIS PETITION

The Public Water Agencies provide below a Statement of Points and Authorities in Support of the legal issues raised in this Petition.

8. A STATEMENT THAT THIS PETITION WAS SENT TO THE REGIONAL WATER BOARD

A true and correct copy of this Petition was mailed by First Class mail on March 9, 2012, to the Regional Water Board at the following address:

Bruce H. Wolfe
Executive Officer
San Francisco Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

As a courtesy, a true and correct copy of the Petition was also mailed to the parties on the attached service list, which includes the Discharger.

9. A STATEMENT AS TO WHETHER PETITIONER RAISED THE SUBSTANTIVE ISSUES OR OBJECTIONS IN THE PETITION TO THE REGIONAL BOARD

The substantive issues or objections raised in this Petition were raised before the Regional Water Board.

II.

STATEMENT OF POINTS AND AUTHORITIES

A. Introduction

The Permit requires State Water Board review and modification to prevent harm to Bay-Delta aquatic life and to help restore and protect the largest single source of fresh water supply in all California. Permit review and amendment is needed to prevent the Discharger from discharging an average of 1,000 pounds per day of harmful ammonium into the Napa River mouth and Bay-Delta Estuary. The Public Water Agencies maintain that overwhelming evidence supports Permit conditions requiring the Discharger to install ammonium removal treatment technology, which is available and practicable. In the alternative—and consistent with another discharge permit the Regional Water Board approved the same day for a nearby treatment plant operated by the Central Contra Costa Sanitary District ("CCCSD")—the Public Water Agencies ask the State Water Board to modify the Permit to require the Discharger to complete specific studies to characterize its contribution to aquatic life impacts and to define a work plan for upgrading the Discharger's Treatment Plant to stop those impacts in the shortest practicable

time.[1]

B. Background

1. The Discharger's Service Area And Treatment Plant

The Discharger's Treatment Plant processes municipal and industrial sewage collected from throughout the City of Vallejo. (Permit at F-4.) The Discharger's current service area population is approximately 117,000. (*Id.*)

The Discharger constructed its Treatment Plant in 1959 to provide primary treatment and upgraded the Treatment Plant in 1988 to provide secondary treatment.[2] The Treatment Plant includes screens, aerated grit removal, primary sedimentation by circular and rectangular clarifiers, biological treatment using trickling filters followed by aeration basins, secondary clarification, disinfection by chlorination with sodium hypochlorite or by ultraviolet light, and dechlorination by sodium bisulfite. (Permit at F-4.) Solids removed from the wastewater stream are hauled off site for disposal. (*Id.*)

The Treatment Plant has an average dry weather flow ("ADWF") design capacity of 15.5 million gallons per day ("MGD"). (Permit at 3, F-3.) The ADWF in 2010 was 10.5 MGD, which leaves 5 MGD of secondary treatment capacity available to serve new land uses at Mare Island or elsewhere in the service area. (*Id.*) The Treatment Plant's wet weather capacity is 35 MGD for full secondary treatment, with an additional 25 MGD of primary treatment capacity. (*Id.*) The

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[1] The Public Water Agencies request that the State Water Board take official notice of, and consider, the CCCSD permit, which the Regional Water Board approved on February 8, 2012, at the same meeting where the Discharger's Permit was approved. A true and correct copy of the CCCSD permit is attached hereto as Exhibit C. While the CCCSD permit is a legal order that should be subject to official notice, just like a State Water Board order, to the extent that the permit might be viewed as extra-record evidence, Petitioners request that the State Water Board admit and consider the CCCSD permit pursuant to Water Code section 13320 and section 2050.6 of Title 23 of the California Code of Regulations. The CCCSD permit is relevant. As explained in Petitioners' Statement of Points and Authorities, the CCCSD permit shows Regional Water Board approval of an alternative permitting approach addressing ammonium discharge impacts without immediately imposing ammonium effluent limits. The CCCSD permit was not approved until February 8, 2012, so the Public Water Agencies could not have submitted the CCCSD permit to the Regional Water Board prior to its November 23, 2011, deadline for submitting comments on the Discharger's draft Permit.

[2] *See* http://www.vsfcd.com/history.htm.

maximum daily wet weather flow between October 2006 and December 2010 was 43.3 MGD. (*Id.*)

During wet weather, flows up to approximately 35 MGD receive secondary treatment. (*Id.*) Flows in excess of 35 MGD and up to 60 MGD are treated in primary sedimentation basins, blended with secondary treated wastewater, disinfected and discharged. (*Id.*) Under normal operating conditions, wastewater is discharged to Carquinez Strait through Discharge Point No. 001. (*Id.*) When wet weather flows exceed 30 MGD, wastewater is discharged into Carquinez Strait through Discharge Point No. 001 and also is discharged into Mare Island Strait through Discharge Point No. 002. (*Id.*) During such conditions, a flow-splitting device sends only secondary-treated and disinfected wastewater into Mare Island Strait (Discharge Point No. 002), while a disinfected blend of primary- and secondary-treated wastewater is discharged into Carquinez Strait (Discharge Point No. 001). (*Id.*)

From 2008 through 2010, the Treatment Plant experienced 17 events in which a total of 80 million gallons of secondary-treated wastewater were discharged into the Mare Island Strait. (Permit, Table F-3 at p. F-6.) Such discharges are likely to increase and become a regular part of operations in the future. The Permit creates a procedure for the Regional Water Board's executive officer to approve the discharge of up to 15.5 MGD of wastewater into the Mare Island Strait under year-round conditions. (Permit at pp. 13-14, F-5.) At an ADWF rate of 15.5 MGD, the Treatment Plant discharges at least 1,000 pounds per day of ammonium into receiving waters. (February 8, 2012, Regional Water Board staff PowerPoint presentation ["Staff Presentation"], slide No. 8 [a copy of which is attached hereto as Exhibit E].)

2. The Special Character Of The Receiving Waters

Delta smelt and longfin smelt often occupy the receiving waters that the Discharger uses to dispose of ammonium and other wastes in the municipal and industrial sewage processed by the Treatment Plant. These fish species are found above, at and below the Treatment Plant's two points of discharge. The receiving waters include the Napa River, Mare Island Strait, Carquinez Strait, Suisun Bay and San Pablo Bay.

Tidal Action Expands The Ammonium Discharge Zone of Impact: The Napa River flows through Mare Island Strait and thence into Carquinez Strait, where incoming tides push receiving waters upstream (into the Napa River and into Suisun Bay) and the outgoing tides spike receiving waters with a double dose of ammonium. (*See* Permit at p. B-1 [facility map]; Staff Presentation, slide No. 4 [regional map]; Permit at p. F-21 [acknowledging complex receiving water hydrology] and p. F-24 [acknowledging tidal impact on waste concentrations in receiving waters]; Mixing Zone Study Report, Vallejo Sanitation and Flood Control District, LimnoTech, March 22, 2011, at p. 10 [acknowledging tidal return of pollutants in Mare Island Strait].) As a result, the zone of impacts from the discharge of ammonium and other wastes is above, at and below the points of discharge.

The Water Quality Control Plan for the San Francisco Bay Basin ("Basin Plan") designates beneficial uses of receiving waters in the Napa River, Mare Island Strait, Carquinez Strait, Suisun Bay and San Pablo Bay. (*See* Basin Plan, Figure 1-1 [map depicting water bodies subject to Basin Plan].) Designated beneficial uses of the Napa River include: Preservation of rare and endangered species; cold and warm water fish habitat; spawning habitat; fish migration; and water contact recreation. (Basin Plan, Table 2-1.) Designated beneficial uses of Mare Island Strait include: Preservation of rare and endangered species; fish migration; estuarine habitat; ocean commercial and sport fishing; and water contact recreation. (*Id.*) Designated beneficial uses of Carquinez Strait include: preservation of rare and endangered species; fish spawning; fish migration; estuarine habitat; ocean commercial and sport fishing; and water contact recreation. (*Id.*) Designated beneficial uses of San Pablo Bay include: preservation of rare and endangered species; fish spawning; fish migration; estuarine habitat; ocean commercial and sport fishing; and water contact recreation. (Basin Plan, Table 2-1.) Designated beneficial uses of Suisun Bay include: preservation of rare and endangered species; fish spawning; fish migration; estuarine habitat; ocean commercial and sport fishing; and water contact recreation. (*Id.*)

The Basin Plan's Narrative Objectives Prohibit Ammonium Discharge Impacts: The Basin Plan establishes the following narrative water quality objectives protecting beneficial uses of the Napa River, Mare Island Strait, Carquinez Strait, San Pablo Bay and Suisun Bay:

- Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses. (Basin Plan, § 3.3.3.)

- All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce significant alterations in population or community ecology or receiving water biota. In addition, the health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors. (Basin Plan, § 3.3.8.)

  - All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species. There shall be no acute toxicity in ambient waters. Acute toxicity is defined as a median of less than 90 percent survival, or less than 70 percent survival, 10 percent of the time, of test organisms in a 96-hour static or continuous flow test.

  - There shall be no chronic toxicity in ambient waters. Chronic toxicity is a detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community.

  - Attainment of this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, or toxicity tests (including those described in Chapter 4), or other methods selected by the Water Board. The Water Board will also consider other relevant information and numeric criteria and guidelines for toxic substances developed by other agencies as appropriate.

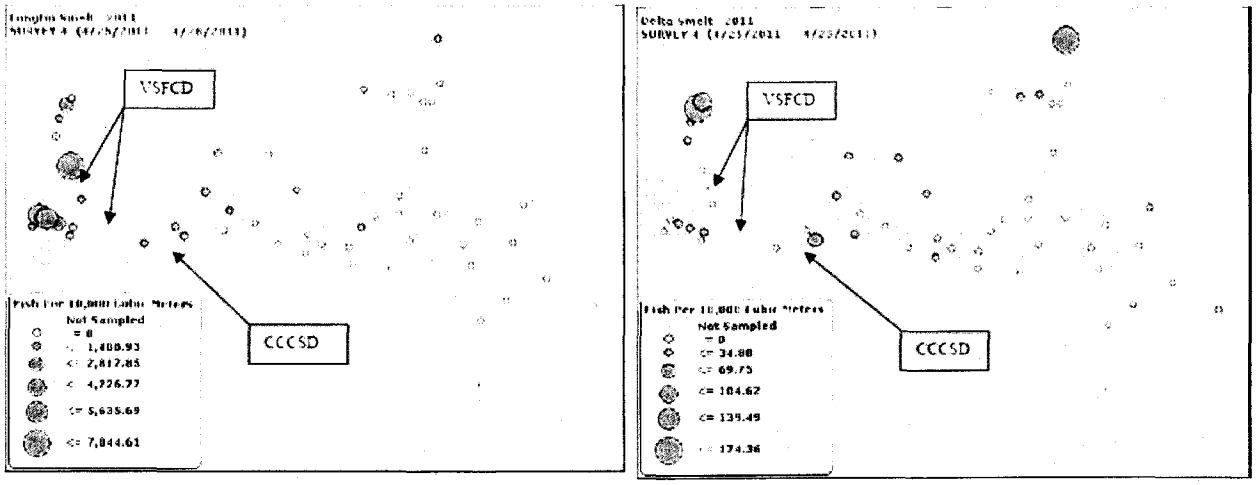
  - The health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.

(Basin Plan at 3-3 to 3-6.) The Basin Plan also establishes a numeric water quality objective for ammonia—the unionized fraction of total ammonia nitrogen—but does not establish a numeric objective for ammonium—the ionized fraction of total ammonia nitrogen that is the focus of the discharge impacts at issue in this proceeding. (Basin Plan at 3-5.)

State and/or Federally Protected Fish Species Occupy Receiving Waters Above, At and Below The Treatment Plant's Two Points of Discharge: Protected species occupying the receiving waters into which the Treatment Plant discharges ammonium and other wastes include Delta smelt and longfin smelt. Delta smelt is listed by the U.S. Fish and Wildlife Service

("USFWS") as a threatened species protected under the federal ESA. (58 Fed. Reg. 12854 [March 5, 1993]; *see also* 75 Fed. Reg. 17667 [April 7, 2010] [USFWS finding that reclassification as endangered is warranted, but precluded by other higher priority listing actions].) Longfin smelt is listed as a threatened species protected under CESA, (14 Cal. Code Regs. § 670.5(b)(2)), and is being considered for listing as threatened or endangered under the federal ESA, (76 Fed. Reg. 13121 [March 10, 2011]). The Permit fails to mention these fish species.

Carquinez Strait and Suisun Bay are within the critical habitat that the USFWS has designated for the Delta smelt. (59 Fed. Reg. 65256-65279 [1994].) Specifically, the Delta smelt's critical habitat encompasses the areas of all water, all submerged lands below ordinary high water, and the entire water column bounded by and contained in Carquinez Strait east of Carquinez Bridge, Suisun Bay, Goodyear, Suisun, Cutoff, First Mallard and Montezuma Sloughs, and the Sacramento-San Joaquin River Delta (as defined in Section 12220 of the California Water Code). (*Id.*) The area designated by the USFWS as critical habitat does not encompass all areas within the Bay-Delta Estuary where Delta smelt and longfin are found. Annual surveys by the California Department of Fish and Game ("DFG") show that a significant portion of the Delta smelt and longfin smelt populations occur in the Napa River, Mare Island Strait and San Pablo Bay. For example, **Figure 1**[3] shows smelt population concentrations in April 2011:



[3] These maps were presented to the Regional Water during the February 8, 2012, hearing, (*see* PWA Presentation, slide No. 3), and as part of a series of maps submitted as Figures 1-4 of the November 23, 2011, Public Water Agencies' written comments on the draft Permit.

The preceding two maps are part of a larger map series that the Public Water Agencies submitted to the Regional Water Board to show that these fish species are located above, at and below the points of discharge controlled by the Permit. (*See* February 8, 2012, Public Water Agencies PowerPoint presentation, slide No. 3; *see* Figures 1-4, attached to November 23, 2011, Public Water Agencies written comments to Regional Water Board on draft Permit.)

3. Proceedings Resulting In The Discharger's New Permit

Discharger Requests Renewal Of Prior Permit: The Discharger's last permit was issued in 2006 with a five-year term. (Permit at p. 3 [citing Order No. R2-2006-0056].) The Discharger applied for renewal of that permit in spring 2011, and the Regional Water Board proposed a draft Permit in fall 2011. (Permit at p. 3.) The Regional Water Board requested comments on the draft Permit by November 28, 2011, and the Public Water Agencies submitted written comments on November 23, 2011 ("PWA Comments"). (A copy of the PWA Comments is attached hereto as Exh. D and are incorporated herein by this reference.)

Public Water Agencies Request Permit Revisions Addressing Ammonium Discharge Impacts: The PWA Comments requested Permit revisions to stop the Treatment Plant from discharging ammonium that is impairing aquatic life beneficial uses of receiving waters in the Bay-Delta Estuary. Specifically, the PWA Comments urged the Regional Water Board to impose ammonium effluent limits requiring nitrification to remove ammonium from the discharge.

The requested Permit revisions were based on three main points. First, the draft Permit failed to control the Treatment Plant's significant discharge of ammonium. Second, the ammonium is being discharged directly into habitat occupied by Delta smelt and longfin smelt and their food prey, among other fish and wildlife. And third, the best available science shows that the discharge is: (1) contributing to ammonium levels that are toxic to copepods eaten by Delta smelt and longfin smelt; (2) contributing to ammonium levels that inhibit nitrogen uptake by diatoms and reduce diatom primary production (which reduces a key food source for copepods eaten by Delta smelt and longfin smelt); and (3) contributing to nutrient levels that are causing a shift in Bay-Delta algal communities by changing the ratios of different nutrients to favor

harmful, invasive species. (*See* PWA Comments.)

The PWA Comments observed that ammonium discharge impacts to diatoms and copepods violate narrative water quality objectives by impairing the aquatic life beneficial use of receiving waters, (*id.*), and that, in turn, the impact to diatoms and copepods harms Delta smelt and longfin smelt by depriving them of food needed to sustain and recover their populations, which constitutes an additional violation of the narrative water quality objective and impairment of the aquatic life beneficial use. (*Id.*) The PWA Comments also noted that regulation intended to protect fish species, including Delta smelt and longfin smelt, has resulted in restrictions on the ability to use the natural channels in the Bay-Delta Estuary to deliver water for drinking, commercial and industrial workplace use and for irrigation of millions of acres of farmland. (*Id.*) The latter beneficial use impairment affects more than 25 million Californians living in two-thirds of the state's households from the greater Bay Area, through the San Joaquin Valley and Central Coast, to Southern California. (*Id.*)

Leading scientists agree that the best available science shows ammonium discharges from sewage treatment plants have more than a reasonable potential to impair aquatic life beneficial use of Bay-Delta receiving waters. (*See* February 8, 2012, Public Water Agencies' PowerPoint presentation ["PWA Presentation"] at slide No. 5 [quoting Delta lead scientist Cliff Dahm advising Delta Stewardship Council, U.S.G.S. scientist James Cloern, and Romburg Tiburon Center scientist Frances Wilkerson].) The Regional Water Board's own senior staff have recently concluded that the best available science shows ammonium discharges are impairing aquatic life beneficial uses of the Bay-Delta Estuary. In June 2010, Regional Water Board Executive Officer Bruce Wolfe concluded:

> One of the primary hypotheses for the pelagic organism decline (POD) is a decline in food availability for POD species. Declines in diatom blooms in Suisun Bay have been well documented by the Interagency Ecological Program (IEP) and others. Studies on the relationship between nutrients and primary productivity in the estuary indicate that ammonia levels in Suisun Bay reduce both nitrate uptake and primary production rates (Wilkerson et al 2006, Dugdale et al 2007).

(PWA Presentation at slide No. 9 [quoting June 4, 2010, letter from Wolfe to Central Valley Regional Water Quality Control Board]; *see also id.* [quoting Regional Water Board Assistant

Executive Officer Dyan White for conclusion that "we do feel like we have strong reason to believe now that there are impacts that we are seeing within our region" from treatment plant ammonium discharges into the Bay-Delta].)

Despite the best available science showing the need for effluent limits on ammonium, the Public Water Agencies took a pragmatic approach by proposing two alternative permitting strategies. First, the Public Water Agencies proposed a continuance of the Permit approval proceeding to provide time to work with the Regional Water Board staff and Discharger to develop Permit conditions addressing ammonium discharge impacts. (PWA Comments at p. 13.) Second, the Public Water Agencies proposed Permit revisions that would set a time-line for the Discharger to characterize its Treatment Plant's specific contribution to Bay-Delta receiving water impacts, while requiring Treatment Plant upgrade planning that would position the Discharger to accomplish ammonium removal on approximately the same schedule as if the Permit required ammonium removal in the first instance. (PWA Comments at pp. 13-14.)

Permitting Staff Acknowledges Ammonium Impact Concern But Recommends No Action: The Regional Water Board prepared responses to the written comments submitted by the Public Water Agencies and the Discharger ("RTC" or "Response to Comments"). The RTC revealed that Regional Water Board staff were unwilling to propose to the Regional Water Board members that the Discharger address ammonium discharge impacts on the Bay-Delta Estuary. The staff were unwilling to address ammonium impacts, despite their acknowledgement that "available scientific information provides cause for concern." (RTC at pp. 14-15.) Consistent with the prior, recent conclusion of the Regional Water Board's executive officer and assistant executive officer that ammonium discharge impacts are harming aquatic life in Suisun Bay, Regional Water Board staff did not challenge the well-documented science showing how ammonium discharges harm the diatoms and copepods that are critical components of the food web sustaining fish, including the Delta smelt and longfin smelt. Rather, staff questioned the application of that science to the site-specific circumstances at the Treatment Plant's points of discharge, citing "significant mixing" due to tidal influence at "outfalls over six miles downstream of Suisun Bay." (RTC at 15.)

However, staff offered no evidence disputing that the ammonium concentrations measured in Treatment Plant effluent and in receiving waters exceed the ammonium impact thresholds defined by the scientific principles publicly affirmed by the Regional Water Board's executive officer and assistant executive officer. Further, staff offered no evidence showing that the Treatment Plant's discharge of ammonium into Mare Island Strait and Carquinez Strait is not causing or contributing to the harmful ammonium concentrations in the receiving waters.

Regional Water Board Follows Staff Recommendation: On February 8, 2012, the Regional Water Board conducted a public hearing and followed the recommendation of its staff. The Regional Water Board approved the Permit without imposing requirements to prevent ammonium discharge impacts on Bay-Delta aquatic life. The Permit fails to impose effluent limits requiring nitrification or to require the Discharger to complete the kinds of studies and plans that CCCSD will undertake pursuant its new permit.

C. <u>The Permit Unlawfully Fails To Address Ammonium Discharge Impacts</u>

The Regional Water Board erred by not taking steps to address ammonium in the Permit. The best available science shows that discharges of ammonium from treatment plants, including ammonium from the Discharger's Treatment Plant, are violating narrative water quality objectives and harming aquatic life beneficial uses. That science is set forth in the record of proceedings culminating in the Regional Water Board's issuance of the Permit. It is unrebutted. Indeed, the absence of any response to the science presented by the Public Water Agencies unquestionably fails to satisfy the Regional Board's obligations to make findings under *Topanga Ass'n for a Scenic Comm. v. County of Los Angeles* (1974) 11 Cal.3d 506. Accordingly, the State Water Board should revise the Permit, or direct the Regional Water Board to revise the Permit, to put the Discharger on an expeditious path to prevent ammonium discharge impacts from harming aquatic life.

The law directing how the Regional Water Board should have addressed ammonium is clear. The starting point is that all waste discharges are prohibited, unless a permitting authority exercises its discretion to authorize a particular discharge. "No discharge of waste into the waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall

create a vested right to continue the discharge. All discharges of waste into waters of the state are privileges, not rights." (Water Code § 13263(g).) Accordingly, all discharge permits must include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and *narrative objectives*. (40 C.F.R. § 122.44(d)(1)(i).) The narrative objectives describe water quality conditions that must be attained through pollutant control measures and watershed management. (Basin Plan § 3.1.) In the San Francisco Bay Region, narrative water quality objectives include protecting against discharges that may impact beneficial uses, have toxic effects, and alter population abundance, community composition, or "any other relevant measure of the health of an aquatic organism, population, or community." (Basin Plan at §§ 3.3.8, 3.3.18.) In order "to determine if a water quality based effluent limitation is required" to comply with a narrative objective, the State Water Board requires regional water boards to consider a range of information, including "the potential toxic impact of discharge, ... water quality and beneficial uses of the receiving water, the presence of endangered or threatened species or critical habitat, and other information." (*See* State Water Resources Control Board, Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California at pp. 6-7 [2005] ["State Implementation Plan or SIP"].)

The Regional Water Board's application of those basic principles in its order approving the Permit must pass muster under the California Supreme Court's holding in *Topanga, supra.* *Topanga* requires the Regional Water Board to describe the evidence and law it has considered and to articulate its reasoning by stating relevant sub-conclusions supportive of its ultimate decision. (*Id.* at 516-517.) Providing an analytical roadmap with clear "roadsigns" is critical to reveal the decision points and rationales that an agency has distilled from a potentially vast and disconnected evidentiary record. (*Id.* at 516-517.) The State Water Board must review the Permit to determine if the Regional Water Board provided the roadmap that *Topanga* requires. If the conclusions supporting the Regional Water Board's decision to omit from the Permit any measures to address ammonium are not supported by evidence in the record, then the required roadmap is absent, and the State Water Board must revise the Permit or remand the Permit to the

Regional Water Board to revise. (*See In the Matter of Petition of City of San Diego (Waste Discharge Requirements Order No. R9-2002-0025 [NPDES No. CA0107409]* [August 15, 2002] [revising permit effluent limit because regional water board "failed to make findings" supporting limit, as required by *Topanga*]; *see also In the Matter of Own Motion Review of Waste Discharge Requirements for the University of California, Davis (Order No. R5-2008-0183 [NPDES No. CA0077895]* [March 16, 2010] [remanding permit to regional water board to correct inadequate reasonable potential analysis for non-priority pollutant].)

Here, in adopting the Permit, the Regional Water Board has failed to properly address the ammonium impacts evidence in the record. The Regional Water Board asserted, *without any citation, analysis, or evidentiary support* in the record, that the impacts are "not well understood." (Permit at F-26; *see also* Response to Comments at p. 15.) Respectfully, the administrative record shows that is not the case. The data, analyses and scientific literature in the administrative record show at least a reasonable potential for ammonium discharged by the Treatment Plant to cause or contribute to the impairment of beneficial uses by: (1) causing toxic effects on aquatic species; (2) inhibiting nitrogen uptake by diatoms and thereby reducing primary production; and (3) contributing to changes in the aquatic food web sustaining the ecosystem of the Bay-Delta Estuary. Moreover, the Treatment Plant discharges directly into receiving waters occupied by threatened Delta smelt and longfin smelt. Yet the Regional Water Board failed to consider the "presence of endangered or threatened species" in its water quality analysis for ammonium, despite the express requirement to do so. (SIP, *supra,* at pp. 6-7.) The ammonium impacts require an immediate and vigorous regulatory response to protect and restore aquatic life, including the Delta smelt and longfin smelt that occupy receiving waters above, at and below the Discharger's Treatment Plant outfalls.

1. Excessive Ammonium Has Been Shown To Be Toxic To Copepods

First, the Permit should be revised to incorporate effluent limits requiring ammonium removal, because the Discharger's Treatment Plant is discharging ammonium at concentrations acutely toxic to the copepods that serve as the primary food source for Delta smelt, longfin smelt and other aquatic life. (*See* PWA Comments at pp. 6-7; *see* Permit at p. F-26 ["Copepods are

important secondary producers, providing food for many fish"].) Thus, the discharge violates the narrative standard for toxicity in the Basin Plan.

Studies in the record before the Regional Water Board establish that low concentrations of untreated ammonium are toxic to copepods. Dr. Swee Teh, a Ph.D in Comparative Pathology and a Research Toxicologist and Pathologist in the Department of Anatomy, Physiology and Cell Biology, at the University of California at Davis,[4] has led research studying the effects of ammonium on the copepods *Eurytemora affinis* and *Pseudodiaptomus forbesi*, including research done during 2010-2011 at the direction of the Central Valley Regional Water Quality Control Board. (*See* S. Teh, et al., Final Report, Full Life-Cycle Bioassay Approach to Assess Chronic Exposure of *Pseudodiaptomus forbesi* to Ammonia/Ammonium – Submitted to C. Foe and M. Gowdy [March 4, 2011] ["Teh, Final Report 2011"], submitted with the PWA Comments.[5]) Dr. Teh and his team concluded that ammonium has "adverse effects … on the growth, reproduction,

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[4] Dr. Teh serves as the Interim Director of the Aquatic Toxicology Laboratory at the UC-Davis School of Veterinary Medicine, and is a UC-Davis Faculty Member for the Graduate Group in Ecology, the Center for Aquatic Biology and Aquaculture, the Center for Health and the Environment, and the John Muir Institute of Environment. Dr. Teh has over 20 years of field and laboratory research experience in aquatic toxicology, carcinogenesis, eco-toxicology, endocrine disruption, and biomarker studies. (Declaration of Dr. Swee Teh (April 29, 2011) ("Teh Decl."), ¶3, submitted with the PWA Comments.) His research has included studying various aspects of the aquatic ecosystem in the San Francisco Bay-Sacramento/San Joaquin River Delta (Bay-Delta). (*See Curriculum Vitae* of Dr. Swee Teh, Teh. Decl., Exhibit 1.) From 2005 to 2007, he served as the Chair of the Contaminant Work Team on the Pelagic Organism Decline for the Interagency Ecological Program in California. (Teh. Decl. ¶4.) He is a member of professional societies, including the American Society of Medical Technology and the American Society of Clinical Pathologists. (Teh. Decl. ¶4.) Dr. Teh conducted his work under the auspices of the Central Valley Regional Water Quality Control Board.

[5] The relevant research includes work summarized in the Teh Declaration and the Exhibits to that Declaration. Werner, et al., Pelagic Organism Decline (POD): Acute and Chronic Invertebrate and Fish Toxicity Testing in the Sacramento-San Joaquin Delta 2008-2010, Final Report Submitted to the California Department of Water Resources (July 24, 2010), (http://www.science.calwater.ca.gov/pdf/workshops/POD/Werner%20et%20al_2010_POD2008-2010_Final%20Report.pdf); (also at Teh Decl. Exhibit 3); Full Life-Cycle Bioassay Approach to Assess Chronic Exposure of P. forbesi to Ammonia/Ammonium to the Delta Pelagic Organism Decline Contaminants Work Team (July 6, 2010), Teh Decl. Exhibit 4; Letter from S. Teh to C. Foe (November 10, 2010), Teh Decl. Exhibit 5; S. Teh, et al., Final Report, Full Life-Cycle Bioassay Approach to Assess Chronic Exposure of *Pseudodiaptomus forbesi* to Ammonia/Ammonium – Submitted to C. Foe and M. Gowdy (March 4, 2011), Teh Decl. Exhibit 6 ("Teh, et al., 2011 Final Report); *see also* Presentation by Dr. Teh to the Central Valley Regional Water Quality Control Board, Ammonia Summit, available at http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/ambient_ammonia_concentrations/index.shtml (August 18-19, 2009).

and survival of parents and progenies of *P. forbesi*" and that the effects have "implications on the abundance of this copepod as an important food source to larval fishes in the Delta." (Teh, et al., 2011 Final Report at 2.) Two independent test methods confirm this conclusion. First, using a 96-hour toxicity test, the researchers found 10 percent mortality occurred in invertebrate species exposed to ammonium concentrations in Bay-Delta receiving water. (Teh, et al., 2011 Final Report at 9-10.[6]) Second, life cycle tests assessed the impacts of different concentrations of ammonium on the ability of the copepod to reproduce and thrive. The life cycle tests showed that ammonium impacted adult *P. forbesi* reproduction at concentrations greater than or equal to 0.79 mg L^{-1}, while observed effects were present for nauplii and juveniles at ammonium concentrations as low as 0.36 mg L^{-1}.[7] According to Dr. Teh, "these results demonstrate that **ammonia significantly impacts populations of *P. forbesi*** as analyzed." (Teh, 2011 Final Report at 2 [emphasis in original].)

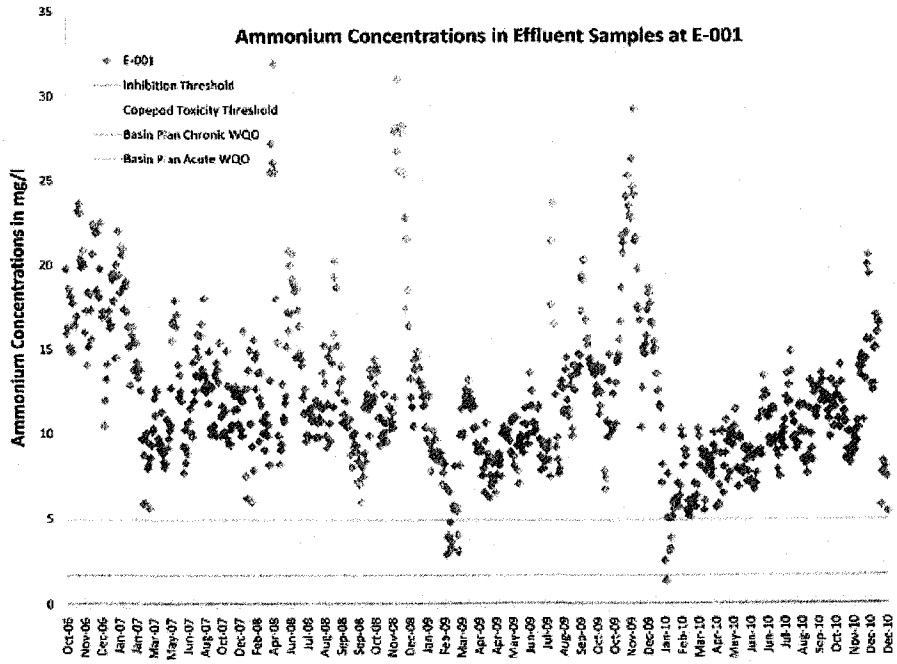

Figure 2 shows that the ammonium concentrations in the Discharger's effluent exceed the

[6] Dr. Teh's 96-hour bioassay test "closely followed the US EPA standard toxicity testing procedures. (US EPA-821-R-02-012; EPA-821-R-02-013)." (Teh. Decl. at ¶7.)

[7] Teh, S. Full Life-Cycle Bioassay Approach, *supra.*

toxicity level for copepods 100 percent of the time. (PWA Comments, Figure 5.) Indeed, most of the data range from 5.0 to 32.0 mg/L, or 15 to 90 times greater than the level that is toxic to copepods essential to the Bay-Delta food web.

The Regional Water Board does not specifically address Dr. Teh's work in its Permit or Response to Comments. (*See* RTC.) The Regional Water Board did not present any contrary data, literature or analyses evaluating or refuting Dr. Teh's conclusions and supporting scientific rationale concerning impacts of the ammonium in the discharge.[8] Instead, in one sentence, without references, data or analysis, the Regional Water Board merely asserts that "*ammonia*"[9] concentrations "observed in Suisun Bay" are "below the low observed effect concentration derived in the studies." (Response to Comments at 15.) Without providing any data or direct response, the Regional Water Board's assertion wholly fails to meet its duty under *Topanga*.

Regardless, the Regional Water Board's cursory analysis is entirely beside the point. The Permit authorizes the Discharger's Treatment Plant to discharge up to 30 million gallons per day of toxic effluent directly into Mare Island Strait and the Napa River,[10] (Permit at F-3 to F-6[11])

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[8] General assertions were made in the hearing before the Regional Water Board about the accuracy of Dr. Teh's methodology. However, none of these assertions are supported by any evidence in the administrative record developed for the Regional Water Board, which is now on review by the State Water Board. In any event, as Dr. Teh's analyses explained, he repeated both tests and each time he confirmed the same results, which were provided to the Central Valley Regional Water Board. (Teh. Decl. at ¶12 [Dr. Teh "repeated the 96-hour acute toxicity laboratory tests" and again observed the "toxic effects"] and at ¶14 ["At the request of the Central Valley Regional Board," he "repeated the life cycle testing" and "confirmed [his] original conclusion of the effects of ammonia on the reproduction of P. forbesi and the number of nauplii surviving to the adult stage."].) Moreover, in testimony during the Regional Water Board hearing, Ms. Frances Brewster dispelled an apparent misunderstanding about Dr. Teh's analytical method by confirming, first, that he indeed used controls to help verify his results and conclusions and, second, that his scientific analyses help establish the ammonium reference toxicity for the test organism *P. forbesi.*

[9] *Ammonium* concentrations are the focus here, not ammonia.

[10] In fact, the Permit creates a special process whereby the Regional Water Board's executive officer may administratively authorize the Discharger to routinely dump secondarily treated sewage into Mare Island Strait/Napa River under year-round conditions in order to reduce Treatment Plant operating costs. (Permit at 13-14, F-5.) The special process seems to bypass the normal permit modification procedure and its opportunities for public participation.

[11] The Permit provides that when wet weather discharges exceed 30 MGD, the Treatment Plant may discharge up to an additional 30 MGD into Mare Island Strait/Napa River. (*Id.*) For example, in 2010 the Treatment Plant discharged 38.8 million gallons of secondarily treated sewage into Mare Island Strait/Napa River from January 19-22. (Permit at F-6 [Table F-3].)

which California Department of Fish and Game ("DFG") surveys show is habitat occupied by Delta smelt and longfin smelt. (*See* Figure 1, *supra.*) Yet the Regional Water Board never mentioned the DFG smelt surveys. Nor did the Regional Water Board assess the toxic effect of ammonium on the copepods that Delta smelt and longfin smelt eat in their habitat.

Put another way—in order to find no reasonable potential to cause or contribute to impairment of the aquatic life beneficial use of receiving waters, the Regional Water Board ignored the discharge constituent (ammonium) that is causing observed toxic impacts on copepods. The Regional Water Board's exclusive focus on receiving water concentrations of ammonia (the unionized form of total ammonia nitrogen) is misleading. It is beyond dispute that with respect to total ammonia nitrogen, "the unionized component is only a small fraction of the total ammonia-nitrogen to which organisms are exposed in the aquatic environment." (Teh. Decl. ¶15 and ¶16 [98-99 percent is ammonium—the *ionized* form of total ammonia nitrogen].) The rest is ionized ammonium. Thus, "[u]sing only the unionized fraction as the criterion," as the Regional Water Board did, is misleading and "would be inconsistent with the actual results" of Dr. Teh's work, which showed that the *total ammonia nitrogen, including the ammonium,* produced the toxic effects on copepods. (Teh. Decl. ¶16.[12]) Further, ignoring the ammonium would be inconsistent with U.S. Environmental Protection Agency ("U.S. EPA") guidance on ammonia. (*See* Teh. Decl. ¶16, *citing* the U.S. EPA's 1999 Update of Ambient Water Quality Criteria for Ammonia [EPA-822-R-99-014] [December 1999] [U.S. EPA 1999 Report.].) The U.S. EPA 1999 Report "strongly suggested the effects of pH on ammonia toxicity are due to the *joint toxicity* of ammonium ion (NH4 +) and unionized ammonia (NH3)." (Teh. Decl. ¶16.) To "not directly address ammonium" as the Regional Water Board did, ignores reality and defies common sense. Organisms are of course "exposed to total ammonia, and not just the unionized fraction, in the ambient environment." (Teh. Decl. ¶16.)

The Regional Water Board erred by ignoring the unrebutted record evidence showing ammonium discharge impacts on copepods.

[12] *See also* Declaration of Patricia M. Glibert, PhD (May 3, 2011) (submitted with Public Water Agencies' comments) (the correct constituent of concern is "ammonium").

2. The Excess Ammonium Is Inhibiting Nitrogen Uptake By Diatoms And Reducing Diatom Primary Production In The Bay-Delta

Second, the Permit should be revised to incorporate effluent limits requiring ammonium removal, because the ammonium loadings are disrupting the food web by inhibiting nitrogen uptake by diatoms in the Bay-Delta Estuary. The record evidence showing this impact is compelling and unrebutted.

Foremost, the scientific literature demonstrates that ammonium disrupts the natural processes essential to the primary production of phytoplankton in the Bay-Delta. Phytoplankton, including diatoms, form the base of the food web and are essential to a healthy aquatic ecosystem. (Permit at F-26 ["Diatoms are single cell algae that significantly contribute to primary production in Suisun Bay (the base of the food web)."].) Primary consumers, such as copepods (P. forbesi), rely on diatoms as their main source of food, and copepods, in turn, serve as a food source for other aquatic life, such as Delta smelt and longfin smelt. (*See* Permit at F-26 ["Diatoms are single-cell algae that significantly contribute to primary production in Suisun Bay (the base of the food web). Copepods are important secondary producers, providing food for many fish."]; see also Teh, et al., 2011 Final Report at 2 [copepods such as P. forbesi are "an important food source to larval fishes in the Delta"]; *see also* Parker, et al., 2012, at 2 [reduction of phytoplankton blooms and primary production is particularly important for the Northern [Bay-Delta Estuary], where food limitation has been demonstrated for zooplankton (Mueller-Solger et al., 2002) and fish species (Bennett and Moyle, 1996) and may be in part responsible for an overall ''pelagic organism decline' (Sommer et al.,2007)."].) In published reports and articles, noted researchers, Drs. Richard Dugdale, Frances Wilkerson, Alexander Parker and others have found that ammonium from wastewater treatment plant discharges is inhibiting nitrogen uptake by diatoms and contributing to reduced diatom production in the Bay-Delta estuary.[13] (*See* PWA Comments,

[13] *See e.g.,* Parker, A.E., A.M. Marchi, J. Drexel-Davidson, R.C. Dugdale, and F.P. Wilkerson. Effect of ammonium and wastewater effluent on riverine phytoplankton in the Sacramento River, CA. Final Report to the State Water Resources Control Board; Wilkerson, F.P., R.C. Dugdale, V.E. Hogue and A. Marchi, 2006. Phytoplankton blooms and nitrogen productivity in San Francisco Bay, Estuaries and Coasts 29(3): 401-416; Dugdale, R.C., F.P. Wilkerson, V.E. Hogue and A. Marchi. 2007. The Role of ammonium and nitrate in spring bloom development in San Francisco Bay. *Estuarine. Coast and Shelf Science* 73: 17-29 ; Sommer, T., C. Armor, R. Baxter, R. Bruer, L. Brown, M. Chotkowski, S. Culberson, F. Feyrer, M. Gingras, B. Herbold, W.

Technical Memorandum at 1 [summarizing research]; *see also* Taberski, Dugdale, et al., SWAMP Monitoring Plan 2011-2012, *San Francisco Bay Region Work Plan; Monitoring Spring Phytoplankton Bloom Progression in Suisun Bay* at 1 [Dec. 2010] ["Work Plan"] at 1-3.[14]) Drs. Dugdale, Wilkerson and Parker are scientists and faculty with the Romberg Tiburon Center for Environmental Studies at San Francisco State University. Collectively they have many decades of experience investigating nutrient and phytoplankton dynamics.[15]

Indeed, Dr. Dugdale and his team have found that at an ammonium concentration of 4 μmol L^{-1} (equivalent to 0.056 mg L^{-1}) nitrate uptake is fully inhibited. As summarized in their report submitted for the record to the Regional Water Board:

> Our data indicate that ammonium above 4 μlmol L-1 (0.056 mg-N L-1) suppresses nitrate assimilation and primary production rates at concentrations as low as 0.014 mg- N L-1, with complete shutdown when concentrations reach 0.056 mg- N L-1.
>
> This ammonium-induced inhibition of nitrate uptake prevents algal blooms important to the health of aquatic life from developing when conditions are otherwise favorable.

(Dugdale, Wilkerson, and Parker, Brief Report in Response to Selected Issues Raised by Sacramento Regional County Sanitation District in Petition for Review of Discharge Permit Issued by the Central Valley Regional Water Quality Control Board at ¶1 [May 4, 2011] ["Dugdale Report"], submitted with the PWA Comments.)[16] Yet, the ammonium concentration

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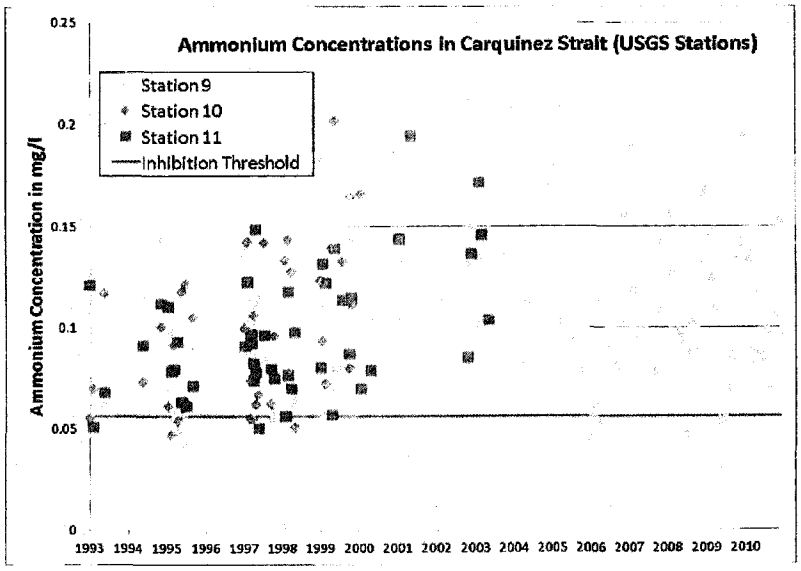
Kimmerer, A. Mueller-Solger, M. Nobriga and K. Souza. 2007. The Collapse of Pelagic Fishes in the Upper San Francisco Estuary, *Fisheries* 32(6):270-277; Glibert, P. 2010a. "Long-term changes in nutrient loading and stoichiometry and their relationships with changes in the food web and dominant pelagic fish species in the San Francisco Estuary, California," *Reviews in Fisheries Science.* 18(2):211 - 232.

[14] http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/workplans/1112rb2wp.pdf.

[15] The *curriculum vitae* of Drs. Dugdale, Wilkerson, and Parker are Exhibit 1 to the Dugdale Report.

[16] *See also,* Wilkerson, et al. (2006) and Dugdale, et al. (2007) (submitted with the PWA Comments) which show that "bloom levels of chlorophyll are evident only when nitrate uptake occurs and that nitrate uptake only takes place at lower ambient ammonium concentrations." They conclude that ammonium concentrations greater than 4 μmol L-1 completely inhibit nitrate uptake by diatoms and thus suppress bloom formation. *See also,* Parker, et al. which observed a 55 percent decline in primary production in the Sacramento River below the Sacramento Regional Wastewater Treatment Plant compared to production above that plant's outfall. Parker, et al. concludes that "[t]he quantitative reduction in primary productivity and nitrogen uptake at various points in the river was predictable and strongly related with NH4 concentrations" and as such, "control of river nutrients, especially NH4 loading, is essential to management efforts to restore the river/estuary to a productive condition." (Parker, et al. was also provided in the Public Water

in Carquinez Strait consistently exceeds the inhibition threshold, as established by data from the federal government's United States Geological Survey ("USGS") monitoring stations 9, 10 and 11 located in Carquinez Strait in the immediate vicinity of the Vallejo discharge.



As shown by the collected data depicted in **Figure 3**, above, the complete ammonium inhibition concentration of 0.056 mg L^{-1} (indicated on the graph by the red line) is repeatedly exceeded and the point at which suppression begins (0.014 mg L-1) has always been exceeded over the course of almost two decades of monitoring. (PWA Comments, Figure 6.) These data demonstrate that the receiving water is impaired, as the ammonium concentrations are 4-5 times greater than the concentrations found to inhibit nitrogen uptake by diatoms and to reduce diatom production.

Importantly, there are similar data from the receiving water quality monitoring location in the lower Napa River. **Figure 4**, on the following page, shows receiving water ammonium concentration data collected from 1993 to 2001 by the Regional Monitoring Program ("RMP"). (PWA Comments, Figure 7.)

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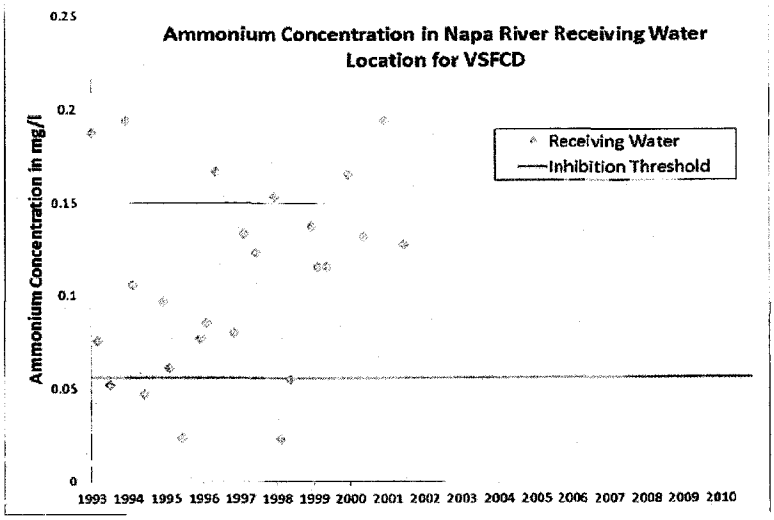
Agencies' comments to the Regional Board and cited as "in review." This paper has since been published. Parker, A.E., et al. Elevated ammonium concentrations from wastewater discharge depress primary productivity in the Sacramento River and the Northern San Francisco Estuary. Mar. Pollut. Bull. (2012) doi:10.1016/j.marpolbul.2011.12.016.)



These data similarly show that the Treatment Plant's receiving water generally has an ammonium concentration substantially above the inhibition threshold for nitrate uptake by diatoms. These are the only data in the record on this geographic zone of impact—and are data from the RMP's Napa River Station BD50, a receiving water station specifically located to monitor the Discharger.

Once again, the Regional Water Board offers no meaningful response to the preceding administrative record evidence showing receiving water impairment for aquatic life beneficial use. Aside from unsupported, conclusory assertions that Regional Water Board staff "do not agree that the existing information is sufficient" to require ammonium removal, (Response to Comments at 15), and that potential for ammonium inhibition "needs to be evaluated in the context of other possible factors that could also affect productivity," the Regional Water Board does not rebut the science and data. (*See* Response to Comments at 14-20.) Nor could they, as the studies provided in comments by the Public Water Agencies are clear and compelling and scientifically undisputed.

Moreover, studies showing ammonium suppressing phytoplankton are not new or unique to the Bay-Delta. (*See* Technical Memorandum at 1-2, submitted with the PWA Comments.) There is a large body of scientific research describing ammonium suppression of primary productivity, which was first observed as far back as the 1930s. (Technical Memorandum [citing Ludwig,

1938; Harvey, 1953].) Some of the early field demonstrations of this phenomenon were by MacIsaac and Dugdale (1969, 1972), followed by research in the Chesapeake Bay by McCarthy, et al. (1975). (*Id.*) Lomas and Glibert (1999a) in fact describe the threshold for initial inhibition of nitrate uptake at ammonium levels of 1 μmol L-1. (*Id.*) Ammonium suppression of nitrate uptake overwhelms cells with an excess of ammonium; and in doing so, alters the cells' ability to assimilate nitrate thereby suppressing primary productivity. This is particularly problematic for the Bay-Delta already a low producing estuary. (*Id.* [citing Jassby et al., 2002].)

The Regional Water Board staff has itself previously made plain that it agrees with the scientific principles of ammonium impacts developed and published by Drs. Dugdale, Wilkerson and Parker. As previously quoted, Regional Water Board Executive Officer Bruce Wolfe concluded in June 2010, "[s]tudies on the relationship between nutrients and primary productivity in the estuary indicate that ammonia levels in Suisun Bay reduce both nitrate uptake and primary production rates (Wilkerson et al 2006, Dugdale et al 2007)." (PWA Presentation, slide No. 9 [quoting June 4, 2010, Wolfe letter to Central Valley Regional Water].) Likewise, Regional Water Board Assistant Executive Officer Dyan Whyte concluded in December 2010 that after taking "a deeper dive into the science" and having "participated in studies and conducted our own studies," the Regional Water Board staff determined that "we have strong reason to believe now that there are impacts that we are seeing within our region, mainly in Suisun Bay," caused by the discharge of nutrients from wastewater treatment plants. (*See* PWA Presentation, slide No. 6 [quoting Whyte testimony at Central Valley Regional Water Board discharger permit proceeding].) Those same scientific principles apply to the discharge of nutrients by the Discharger's Treatment Plant into the Bay-Delta Estuary.[17]

Unable to directly challenge the scientific principles showing ammonium discharge impacts on aquatic life, the Regional Water Board cites a single telephone conversation to support its

[17] The Public Water Agencies do of course recognize that the size and location of the Sacramento Regional Wastewater Treatment Plant ("SRWTP") discharge distinguishes it from all other contributions of nutrients to the Bay-Delta. However, the basic scientific principles of nitrate suppression apply equally to the Discharger at issue here, as well as to other dischargers, like the SRWTP.

contention that the Treatment Plant's "discharge is unlikely to contribute significant amounts of ammonia to Suisun Bay" due to current, tide and dilution. (Permit at F-26.) That general assertion misses the mark for several reasons. For one, the Regional Water Board's position completely ignores the administrative record, which shows that the discharge of ammonium has the reasonable potential to cause or contribute to the violation of narrative water quality objectives protecting aquatic life in receiving waters in Mare Island Strait and Carquinez Strait. That record evidence is unrebutted. Assumptions about tides, currents and dilution are fine concepts, but receiving water quality sampling demonstrates that in the real world, the Discharger releases effluent with high ammonium concentrations, and the receiving water has ammonium concentrations that exceed documented aquatic life impact thresholds. (*See* Figures 2-4, *supra.*) The administrative record contains no evidence showing that the Treatment Plant discharge will not cause those impacts or that the prevailing current will simply wash away the problems arising from the discharge of 15.5 million gallons per day or more of effluent containing untreated nutrients, like ammonium.

Moreover, the simplistic reliance on a purported prevailing current does not address the complexities in hydrologic conditions of the immediate receiving waters. The Regional Water Board asserts that the "discharge to Mare Island Strait is also not expected to *substantially* affect Suisun Bay" – thereby acknowledging *some* impact – but because the "near surface current direction" is seaward, it then assumes receiving water beneficial uses will not be impaired. The Permit acknowledges that the hydrology in this area is a "very complex estuarine system with highly variable and seasonal upstream freshwater inflows and diurnal tidal saltwater inputs," (Permit at F-24), that there is a "three dimensional" aspect to the current "resulting from the interactions of tidal flushes and seasonal fresh water flows," (Permit at F-24), and that these "complex patterns … are most prevalent in the San Pablo Bay, Carquinez Strait, and Suisun Bay areas," but that the "locations of this mixing and interaction change …." (Permit at F-24.) Given the recognized hydrologic complexity of the receiving waters, it is inappropriate and improper for the Regional Water Board to rely upon vague notions of "current," reflected in a single telephone conversation, as the sole basis for decided not to protect aquatic life beneficial uses of receiving

waters, particularly in the face of hard data showing receiving water ammonium concentrations that harm diatoms and are toxic to copepods.

3. Nutrient Discharges Into the Bay-Delta Estuary Are Contributing To A Shift In Algal Communities By Changing The Nutrient Ratios To Favor Harmful, Invasive Species

Third, the Permit should be revised to incorporate effluent limits requiring ammonium removal, because the research of Dr. Patricia Glibert and other experts demonstrates that ammonium discharges have harmed aquatic life in the Bay-Delta Estuary by increasing the ratio of nitrogen to phosphorus in the receiving waters, which triggers impacts to the food web on which Bay-Delta aquatic life depends. (*See* Technical Memorandum at 4-8; *see also* Declaration of Patricia M. Glibert, PhD [May 3, 2011] ["Glibert. Decl."] [submitted with the PWA Comments].) Increasing ammonium discharges, particularly while phosphorus discharges have been declining, degrades water quality by changing the ratio between dissolved inorganic nitrogen and phosphorus, as well as the ratio between total nitrogen and total phosphorus. These ratios are known to have profound influences on food webs.[18]

Dr. Glibert is a world-renowned aquatic ecologist and nutrient biogeochemist with more than 30 years of experience working on issues related to nutrient loading, nutrient ratios, eutrophication, changes in trophic dynamics, harmful algae, and management implications of nutrient loading all over the world. Throughout her professional career, she has studied, and published on, nutrients and food web dynamics in systems ranging from laboratory cultures and experimental water enclosures to field sites. Her papers cover such topics as phytoplankton nutrient uptake and photosynthesis, nutrient excretion by zooplankton, harmful algal physiology, nutrient preferential use by phytoplankton, eutrophication, and global nutrient modeling, and she has conducted field investigations in ecosystems across the globe.[19]

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[18] *See* Ecological stoichiometry: The biology of elements from molecules to the biosphere. Princeton University Press, Princeton, N.J. Sterner and Elser (2002) ["Sterner, R. W. and J.J. Elser. 2002"] [concluding "Stoichiometry can either constrain trophic cascades by diminishing the chances of success of key species, or be a critical aspect of spectacular trophic cascades with large shifts in primary producer species and major shifts in ecosystem nutrient cycling."], submitted with the PWA Comments.)

[19] *See* Glibert Decl. at 1-2 and at Exhibit 1 (*curriculum vitae*), submitted with the PWA Comments. Dr. Glibert's research has ranged "from the Chesapeake Bay to the Southern Ocean,

Dr. Glibert's research indicates that changes in Delta smelt, longfin smelt and several other fish species' abundance are ultimately related to increasing ammonium loads from wastewater discharges. The Public Water Agencies detailed Dr. Glibert's work, and the extensive body of literature supporting it, in the record in the course of the Regional Water Board's Permit proceeding. (*See* Technical Memorandum at 4-8.) Briefly, in an analysis of 30 years of data from the Bay-Delta, Dr. Glibert (2010; Glibert et al., 2011) found that the variation in nutrient concentrations and ratios is highly correlated to variations in the base of the food web, primarily the composition of phytoplankton species, to variations in the composition of zooplankton species, to variations in the abundance of invasive clams, and to variations in the abundance of fish species. Thus, the analysis shows that excess ammonium contributes to the decline of native pelagic fish populations through variations in the phytoplankton (*i.e.,* diatoms) that support the zooplankton (*i.e.,* copepods, like *P. forbesi*) that serve as their food sources, while the ammonium also supports invasive species as "the literature demonstrates that abundance and toxicity of *Microcystis* are significantly enhanced by ammonium, particularly under high nutrient ratios." (Glibert Decl. at 4 and at 5-6.) Accordingly, Dr. Glibert has concluded that "[r]emediation of pelagic fish populations should be centered on reduction of nitrogen loads and reestablishment of balanced nutrient ratios delivered from point source discharges."[20] That is because "reductions in

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from Florida Bay to coastal Australia and Brazil, from the Baltic Sea to the East China Sea, from Kuwait Bay to Long Island Sound, from Gulf of Oman to Hong Kong coastal waters, as well as many other sites, including San Francisco Bay/Sacramento-San Joaquin River Delta." (Glibert Decl. at 1.) Dr. Glibert received an honorary doctorate degree from Linnaeus University, Sweden (http://lnu.se/aboutlnu/1.45678/linnaeus-university-has-appointed-four-hon). In 2006, the Board of Regents of the University System of Maryland recognized Dr. Glibert with an award for "Excellence in research, scholarship and creative activity" - one of 3 such awards given to faculty from across the 17 campuses of the University System. She has published over 150 peer reviewed papers and book chapters which collectively have been cited over 4500 times. She serves or has served as an associate editor on three research journals, including as invited lead editor of a special issue of the Chinese Journal of Oceanology and Limnology related to eutrophication and algal blooms. She also serves as the co-chair of the U.S. National Harmful Algal Bloom (HAB) Committee, chair of the committee on eutrophication for the international GEOHAB Programme, and co-chair of the international SCOR/LOICZ Working Group on HABs and Eutrophication. She has consulted with the ministries of Kuwait and Oman on issues related to nutrient pollution and harmful algae, served as an independent advisor to the Chinese Academy of Sciences related to their studies of eutrophication, and serves, or has served, on numerous panels and advisory boards related to nutrient management for the federal government and the states of Florida and Maryland.

[20] Glibert, P. 2010a.

N (especially NH_4^+ [ammonium]) will allow organisms, from diatoms to fish, that cannot withstand high NH_4^+ (and/or that are outcompeted by NH_4^+ - tolerant organisms, such as various harmful dinoflagellates and cyanobacteria), to compete." (Glibert, et al., 2011). Accordingly, the addition to Bay-Delta receiving waters of ammonium from wastewater treatment plants, including from the Discharger's Treatment Plant, must be controlled to best ensure that the overall system can be fully restored. Indeed, overall:

> without a rebalancing of the N:P ratios, the food web cannot recover to one supportive of higher pelagic production. Without rebalancing of the N:P ratios, the benthic food web, driven by invasive weed production and invasive bivalves will continue to thrive. Without rebalancing the N:P ratio, fish communities will continue to be dominated by predators. The N:P balance can and should be lowered.

(Glibert Decl. at 47.)

The Regional Water Board has offered no meaningful response to the record evidence showing that reducing ammonium discharges is necessary to prevent ongoing harm to aquatic life beneficial uses of receiving waters. The sum and substance of the Regional Water Board's entire response is one conclusory sentence asserting that "scientists disagree about whether changing nutrient ratios are harming Suisun Bay algal communities." (RTC at 15.) There is, however, nothing in the administrative record to support that claim, and the analyses of Dr. Glibert have been peer reviewed and are in all respects sound. Indeed, the core notion underlying Dr. Glibert's work—that altering the nutrient ratios impacts aquatic life – is not even a new or novel proposition. Altering nutrient ratios has long been shown to influence phytoplankton community composition and the presence—or absence—of native species and vegetation, as extensive studies have repeatedly demonstrated in systems around the world, including: Hong Kong, Tunisia, Germany, Florida, Spain, Korea, Japan, and Washington, D.C. (Chesapeake Bay), among others. (*See* Technical Memorandum at 4-8 [discussing body of literature]; *see* Glibert, et al. (2011) [evaluating 30 different systems]; Glibert Decl. at 44-46 [highlighting support from "comparable systems"].)

4. Nutrient Removal Will Protect Aquatic Life Beneficial Uses

Thus, the Permit should be revised to incorporate effluent limits requiring ammonium removal, because the best available science—unrebutted by the Regional Water Board—shows the Treatment Plant's discharge has at least the reasonable potential to impair the beneficial use of receiving waters for aquatic life. Protecting aquatic life beneficial use, therefore, requires effluent limits controlling ammonium. Investing in nutrient removal would not just maintain the present impaired ecosystem, but would contribute to restoration of the overall health of aquatic life in the Bay-Delta, including the Mare Island Strait/Napa River habitat for Delta smelt and longfin smelt. That benefit is supported by an extensive body of literature documenting improvements in ecosystem functions in hydrologic systems where nutrient loading from wastewater treatment plants and other sources has been controlled and reduced. Reducing nutrient loading in the Chesapeake Bay, Tampa Bay and coastal areas of Denmark has proven to be effective at reversing the harmful effects of previously undertreated wastewater discharges and restoring the native systems. (*See* Technical Memorandum at 5-7 [discussing literature]; see Glibert, et al. (2011) and Glibert Decl. at 45 [noting improvements that resulted "following the removal of nutrients from wastewater effluent" discharged to Tampa Bay and "advancements in nitrogen sewage treatment" in Italy].)

For example, as shown by **Figure 5**, on the following page, within several years of nutrient removal at the Blue Plains wastewater treatment plant in Washington, D.C., "not only have native seagrasses begun to return following nitrogen reduction from the Blue Plains Wastewater Treatment Plant, but the invasive *Corbicula* has also declined (Jaworski et al., 2007; Cummins et al., 2010; Ruhl and Rybicki, 2010)." (Glibert Decl. at 45; *see* Technical Memorandum at 5-6.)

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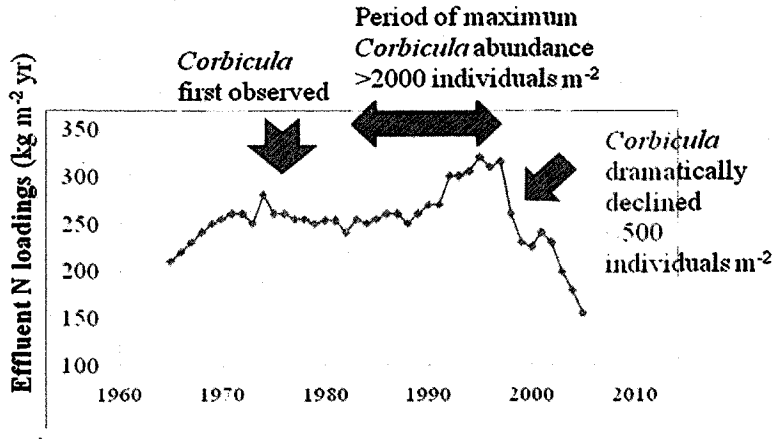
Potomac River: Corbicula abundance in relation to N loadings



Comparative relationships for the Potomac River showing the change in effluent N loading and the relative abundance of the invasive clam

Moreover, there is recent empirical evidence in this ecosystem demonstrating that reducing ammonium loadings improves the chance of diatom blooms essential to primary productivity in the Bay-Delta. In Suisun Bay, a diatom bloom reached chlorophyll concentrations of 30 µg L-1 during spring 2000 when ammonium concentrations declined to 1.9 µmol L-1. (Wilkerson et al. 2006.) Similarly, chlorophyll concentrations in Suisun Bay reached 35 µg L-1 during spring 2010 when ammonium concentrations declined to 0.5 µmol L-1. (Dugdale et al., 2011.) These blooms are comparable to spring chlorophyll levels from 1969-1977, (Ball and Arthur, 1979), when ammonium concentrations were much reduced—before substantial nutrient contributions were introduced into the Bay-Delta system. (Cloern and Cheng, 1981.)

Further, the technology to accomplish nutrient removal is readily available, a fact the Regional Water Board confirmed. (RTC at 14 ["We agree that technology for additional ammonia removal is available."].) In point of fact, control technology to remove ammonium (nitrification) already has been required at many other treatment plants discharging directly or indirectly into the Bay-Delta, including SRWTP, Stockton, Fairfield, Manteca, Tracy, Vacaville Easterly WWTP, Woodland, Lodi, Davis, Mountain House, and Galt. (PWA Comments, Table

1.) Thus, there is nothing novel or impracticable about requiring ammonium removal.

Crucially, the Treatment Plant discharge at issue here is particularly significant in that significant populations of Delta smelt and longfin smelt are found above, at and below, Vallejo's points of discharge. (Figure 1, *supra.*) That the Regional Water Board wholly failed to even address this fact and these data in any way is itself clear error and a reason for the State Water Board to grant the relief requested by this Petition. The decline of those listed fish species is causing severe restrictions on water supplies that harm more than 25 million Californians living in two-thirds of the state's households and that jeopardize farming on approximately 2 million acres of prime agricultural lands.

Discharging wastes into the waters of this State is a conditional privilege. (Water Code § 13262(g).) There is no vested right to continue discharging wastes. To that end, the Discharger has the burden to show, and the Regional Water Board has the burden to find based on evidence, that a discharge of wastes is not causing water quality impacts. Yet here, the Regional Water Board reversed those burdens and turned state and federal water law and this Permit process on its head. That burden-shifting should not be countenanced by the State Water Board. Instead, based on the evidence in the record, there is ample basis to establish a reasonable potential for impacts to beneficial uses. Accordingly, the Permit should include ammonium effluent limits preventing this Discharger from contributing to those observed impacts.

5. Antidegradation Policy Requires Ammonium Removal As Best Practical Treatment Or Control

The Permit should be revised to incorporate effluent limits requiring ammonium removal based on state and federal Antidegradation Policy. California's Antidegradation Policy is summarized in the State Water Board's 1990 Administrative Procedures Update ("APU"), which was meant to "provide guidance for the Regional Boards for implementing State Board Resolution No. 68-16 … and the Federal Antidegradation Policy, as set forth in 40 C.F.R. §

131.12." (APU 90-04, [July 1, 1990] at p. 1.) As such, the APU is designed to help the Regional Water Board implement both federal policy, 40 C.F.R. § 131.12, and the State Water Board's Antidegradation Policy, Resolution No. 68-16.

State Water Board Resolution 68-16 mandates that high water quality must be maintained unless the discharger can prove that lowering the water quality: (1) will provide "maximum benefit" to the state; (2) will not impair present or anticipated beneficial uses of the receiving water; and (3) will not violate water quality objectives. Additionally, discharges that increase the volume or concentration of waste in high quality waters must comply with discharge limits based on the "best practicable treatment or control" ("BPTC"), which ensures that no pollution or nuisance will occur and that the highest water quality will be maintained.

The Permit violates federal and state Antidegradation Policy by allowing degradation of receiving waters due to ammonium discharge. The Treatment Plant's current average actual discharge is 10.5 MGD. (Permit at p. F-4.) The Permit allows that discharge to physically increase by nearly 48 percent, to 15.5 MGD, above the existing discharge level. Although the Treatment Plant's ammonium discharge is impairing aquatic life beneficial uses (as described above), the Permit does not require any ammonium removal. By allowing at least a 48 percent increase in the discharge of ammonium, the Permit would allow increasing degradation of receiving waters from current conditions. Those receiving waters are habitat occupied by threatened Delta smelt and longfin smelt, by other fish and by the diatoms and copepods comprising the foundation of the food web sustaining all these species. The Permit allows the Treatment Plant discharge to further degrade habitat and harm Delta smelt, longfin smelt and other species. In so doing, it also further jeopardizes the largest single source of fresh water supply in all California.

The Public Water Agencies alerted the Regional Water Board that, prior to issuing the Discharger's Permit, federal and state Antidegradation Policy required the Regional Water Board: (1) to determine that permit conditions result in BPTC; and (2) to determine whether any water quality degradation that will result is permissible when balanced against the benefit to the public from issuing the Permit. Here, the Permit makes no findings with respect to BPTC and the

balancing of water quality degradation against any public benefit from allowing degradation. The Permit discloses no analysis showing how the degradation of receiving water quality from the continuation of the existing 10.5 MGD discharge level, and how the additional degradation from allowing a 48 percent increase in that discharge to 15.5 MGD complies with Antidegradation Policy. Nowhere does the Permit, or any other record document identified by the Regional Water Board, present a complete and legally adequate analysis of compliance with the Antidegradation Policy for this Treatment Plant discharge. Yet the law requires the Regional Water Board to conduct such an analysis when action on a discharge permit would cause either: (1) a substantial increase in mass emissions of a pollutant, even if the receiving waters are not polluted by the discharge; or (2) mortality or reproductive effects to resident species. (APU 90-004 at p. 3.) Such is the case here.

The Public Water Agencies raised the preceding Antidegradation Compliance problems in their written comments to the Regional Water Board. (PWA Comments at 11-12.) In response, the Regional Water Board contended that the Permit "could not possibly degrade Suisun Bay water quality with respect to ammonia." (RTC at 18.) According to the Regional Water Board, the Treatment Plant discharge will not degrade the quality of receiving waters, because the Permit "does not authorize any increase in effluent flow or ammonia concentrations beyond those the previous permit allowed." The problem with the Regional Water Board response is that Antidegradation Policy focuses on how discharges under the Permit will actually affect receiving water quality in the real world.

State Antidegradation Policy provides:

> Baseline quality is defined as the best quality of the receiving water that has existed since 1968 when considering Resolution No. 68-16, or since 1975 under the federal policy, unless subsequent lowering was due to regulatory action consistent with State and federal antidegradation policies. If poorer water quality was permitted, the most recent water quality resulting from permitted action is the baseline water quality to be considered in any antidegradation analysis.

(APU 90-04 at 4.) Here, while the Discharger's actual ongoing discharge of ammonium and other wastes has lowered Bay-Delta receiving water quality, that lowering was not "due to regulatory action consistent with State and federal antidegradation policies," because no complete

Antidegradation Policy analysis has apparently ever been conducted for the Treatment Plant.

Neither the Response to Comments nor any other information in the record before the Regional Water Board evidences, suggests or implies that a complete Antidegradation Policy compliance analysis has ever been completed for this Discharger. The Permit fails to refer to any such analysis and, instead, asserts a mere tautology:

> Because antidegradation requirements are met, there will be no lowering of water quality beyond the current level authorized in the previous permit, which is the baseline by which to measure whether degradation will occur. Therefore, further analysis in this permit is unnecessary, and findings authorizing degradation are thus unnecessary.

(Permit at F-32.) The prior permit (R2-2006-0056), approved in 2006, contains a four-sentence definition of Antidegradation Policy but neither provides nor references any complete Antidegradation Policy analysis. The permit approved in 2000 (R2-2000-0026) refers to Antidegradation Policy but neither provides nor references any analysis. Earlier permits seem to be utterly silent with respect to Antidegradation Policy compliance.

Furthermore, even assuming for argument that poorer receiving water quality was previously "permitted" does not support the Regional Water Board's decision to use 15.5 MGD as the baseline. Under APU 90-04, "if poorer water quality was permitted, the most recent water quality resulting from permitted action is the baseline water quality to be considered in any antidegradation analysis." (APU 90-04 at 4.) Accordingly, under this argument, the baseline would be the Discharger's approximately 10.5 MGD discharge, not the 15.5 MGD limit in its prior permit.[21]

In any event, the additional ammonium loading allowed from the discharge of up to 15.5 MGD under the Permit will degrade receiving water quality compared to either existing conditions (reflecting 10.5 MGD) or the Antidegradation Policy baseline predating existing conditions. As a result, the Permit should have provided that the Discharger "will be required to

[21] Notably, this statement from APU 90-04 comports with the California Environmental Quality Act, which does not allow the use of a prior permit's upper limit to be used as the baseline for determining the significance of environmental effects, if actual activity/performance under the old permit is lower than that maximum permitted level. (*See Comm. For A Better Environment v. South Coast Air Quality Mgt. Dist.* (2010) 48 Cal. 4th 310, 320-321.)

meet waste discharge requirements which will result in the best practicable treatment or control of the discharge . . . ." (State Water Board Res. No. 68-16, Statement of Policy With Respect to Maintaining High Quality Waters in California.) With respect to ammonium removal, nitrification already is either in place or required at most other municipal wastewater treatment plants discharging to the Bay-Delta. (*See* PWA Comments, Table 1.) Thus, ammonium removal by nitrification is BPTC required at the Discharger's Treatment Plant.

The Regional Water Board failed to perform a complete and legally adequate analysis demonstrating how the 15.5 MGD Treatment Plant discharge authorized by the Permit would comply with Antidegradation Policy, including ammonium effluent limits that require BPTC. That failure makes the Permit unlawful, because it authorizes the Discharger to degrade receiving water quality, to violate applicable water quality objectives, and to impair the aquatic life beneficial use of receiving water—all in violation of state and federal water quality protection law. To comply with Antidegradation Policy, the Permit should be revised to incorporate effluent limits requiring ammonium removal, in order to prevent degradation of receiving water quality to the point of impairing the aquatic life beneficial use.

D. <u>In The Alternative, The Vallejo Permit Should Be Revised To Mirror The CCCSD Permit's Requirements To Confirm The Discharger's Contribution To Ammonium Impacts And To Plan Treatment Upgrades</u>

In an effort to provide pragmatic alternatives for the Regional Water Board's consideration, the Public Water Agencies urged that the Permit at least impose a detailed, expeditious framework and timeline for addressing ammonium discharge impacts. The proposed framework has three components.

<u>First</u>, the Permit should include findings that the ammonium in the Treatment Plant discharge may be causing or contributing to aquatic life beneficial use impairment in the Napa River, Mare Island Strait, Carquinez Strait, San Pablo Bay and Suisun Bay and that, therefore, the Regional Water Board and the Discharger are committed to implementing studies to evaluate nutrient discharge impacts. The Permit should include a work plan and schedule for receiving water monitoring and associated studies, including sampling in the Napa River both upstream and

downstream from the point of discharge.[22]

Second, the Permit should set a clear reopening procedure for incorporation of ammonium effluent limits, with full public participation in the process, after the studies are completed and the data are published. The Permit should include deadlines to ensure the ammonium limits are reconsidered no later than 36 months after the Regional Water Board issues a final permit. That would be consistent with the CCCSD permit.[23]

Third, the Permit should set interim effluent limits consistent with the actual daily and monthly average maximum concentrations of ammonium in the Treatment Plant's discharge, with a modest margin for compliance. With the maximum observed concentration of ammonium according to the Regional Water Board in the range of 32 mg/L, there is no rational basis in the record for the Permit's limits of 44 mg/L (monthly) and 86 mg/L (daily maximum). (Permit F-27.)

Language implementing the preceding Permit revisions is set forth in Exhibit B to this Petition.

The Regional Water Board followed just such an approach in the discharge permit it approved for the Central Contra Costa Sanitary District, or CCCSD, treatment plant. The CCCSD permit committed the Discharger to work with the Regional Water Board to timely complete studies confirming its contribution to ammonium discharge impacts in receiving waters, while also completing a work plan for upgrading CCCSD's treatment plant to remove ammonium through nitrification. (*See* Regional Water Board Order No. R2-2012-0016 [NPDES No. CA0037648], attached hereto as Exhibit C.) Given the time typically required to complete physical construction of treatment plant upgrades, the permitting approach approved for CCCSD is expected to accomplish ammonium control in approximately the same time as would have occurred if CCCSD's new permit had immediately included ammonium effluent limits with a

[22] Receiving water monitoring and associated studies already are being undertaken or are committed to be undertaken for San Pablo Bay and Suisun Bay as a result of other Regional Water Board and other discharger actions.

[23] The Public Water Agencies originally proposed a shorter, 12-month reopener for the Discharger. Allowing three years would treat the Discharger the same as CCCSD.

time schedule order setting a reasonable compliance date.

As an alternative to immediately imposing ammonium effluent limits, there is no reason that the Regional Water Board should not have at least applied the CCCSD permitting approach to the Discharger at issue here. The Permit revisions required to do so are relatively simple. (*See* Exh. B [setting forth revisions proposed to specified Permit sections].) After all, the Regional Water Board approved the CCCSD permit on the same day, at the same meeting, as it approved the Discharger's Permit. The failure to approve even this alternative, compromise approach reflects an utterly inappropriate and improper Permit decision.

III.

CONCLUSION

In this case, the Regional Water Board has issued a Permit authorizing unabated ammonium discharges into Bay-Delta receiving waters occupied by threatened Delta smelt and longfin smelt. The record of proceedings contains unrebutted evidence demonstrating that ammonium concentrations in receiving waters used to assimilate the Discharger's wastes already exceed aquatic life impact thresholds. Unrebutted record evidence shows that ammonium concentrations in the Discharger's effluent far exceed those impact thresholds. And unrebutted record evidence shows that most other sewage treatment plants discharging to the Bay-Delta already are required to remove ammonium.

There is no valid reason rooted in fact or law that justifies approval of the Discharger's Permit without addressing ammonium impacts. In the face of the overwhelming record evidence, the Permit stands water law on its head by effectively treating the Discharger as if it has a vested right to use Bay-Delta receiving waters to assimilate ammonium and other wastes. As such, the Permit violates not only the California Water Code, (*see, e.g.,* Water Code § 13263(g) [no vested right to discharge wastes]), but Article X, section 2 of the California Constitution. Simply put, the Permit authorizes an unreasonable use of the State's most precious resource: Water. The consequences of that unreasonable use are statewide.

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For all the preceding reasons, the Public Water Agencies request that the State Water Board grant the relief requested herein.

DATED: March 9, 2012.

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PROOF OF SERVICE

I, Terri Whitman, declare:

I am a citizen of the United States and employed in Sacramento County, California. I am over the age of eighteen years and not a party to the within-entitled action. My business address is 400 Capitol Mall, 27th Floor, Sacramento, California 95814. On March 9, 2012, I served a copy of the within document(s):

PETITION FOR REVIEW AND STATEMENT OF POINTS AND AUTHORITIES

☐ by transmitting via facsimile the document(s) listed above to the fax number(s) set forth below on this date before 5:00 p.m.

☒ by placing the document(s) listed above in a sealed envelope with postage thereon fully prepaid, the United States mail at Sacramento, California addressed as set forth below.

☐ by placing the document(s) listed above in a sealed Federal Express envelope and affixing a pre-paid air bill, and causing the envelope to be delivered to a Federal Express agent for delivery.

☐ by personally delivering the document(s) listed above to the person(s) at the address(es) set forth below.

☐ by transmitting via e-mail or electronic transmission the document(s) listed above to the person(s) at the e-mail address(es) set forth below.

See attached Service List

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

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

Executed on March 9, 2012, at Sacramento, California.

Terri Whitman

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