

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**

**SAN FRANCISCO BAY REGION**

**R2-2005-0006**

**NPDES PERMIT NO. CA0038814**

**WASTE DISCHARGE REQUIREMENTS FOR:**

**MARIN MUNICIPAL WATER DISTRICT**

**DESALINATION PILOT PLANT**

**SAN RAFAEL**

**MARIN COUNTY**

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**SAN FRANCISCO BAY REGION**

**ORDER NO: R2-2005-0006**

**NPDES PERMIT NO. CA0038814**

**WASTE DISCHARGE REQUIREMENTS FOR:**

**MARIN MUNICIPAL WATER DISTRICT  
DESALINATION PILOT PLANT  
SAN RAFAEL, MARIN COUNTY**

**FINDINGS**

The California Regional Water Quality Control Board, San Francisco Bay Region (the Board) finds that:

1. *Discharger and Permit Application.* The Marin Municipal Water District (the Discharger) has applied to the Board for issuance of waste discharge requirements and a permit to discharge recombined reverse osmosis (R.O.) concentrate and permeate, and overflows<sup>1</sup> (consisting of bay water and pretreated bay water) from a temporary desalination plant (the Pilot Plant) to waters of the State and the United States under the National Pollutant Discharge Elimination System (NPDES).

**Purpose**

2. The Discharger will continuously operate the Pilot Plant for at least nine months but no longer than twelve months. This Pilot Plant will be used to evaluate the feasibility of producing drinking water from bay water using the reverse osmosis desalination process. The Pilot Plant will withdraw water from the bay, filter the bay water in one of three pretreatment systems, and then desalt the bay water using reverse osmosis. These processes produce three waste streams: reverse osmosis permeate (drinking water), reverse osmosis concentrate (brine), and overflows (consisting of bay water and pretreated bay water). After the Discharger evaluates the efficacy of the treatment processes to produce drinking water that meets both the Discharger's and regulatory standards, the reverse osmosis permeate and concentrate are recombined with minimal overflows from the pretreatment processes, and discharged (returned) to the bay. The sludge produced from the pretreatment processes is discharged to the local sanitary sewer. This Order regulates the discharge of bay water from the Pilot Plant.

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<sup>1</sup> These flows include bay water removed but not used in the pretreatment and desalination process, and pretreated bay water not needed for the desalination process.

### **Facility Description**

3. *Service Area, Population, and Facility Location.* The Discharger is a public water supply and management agency that is responsible for providing drinking water to over 170,000 consumers in the eastern corridor of southern Marin County, and manages over 38,000 acres of watershed, which includes seven reservoirs. The Discharger, through the Pilot Plant, is studying the feasibility of operating a 15-MGD seawater R.O. desalination plant. The Pilot Plant is located at 2675 Francisco Boulevard East, San Rafael. The Pilot Plant will withdraw (intake), process, and discharge an average of 180,000 gallons per day of bay water.

### **Treatment Process Description**

4. *Treatment Process.* The Discharger's treatment process consists of periodic chlorination, pretreatment, conventional filtration or submerged-membrane filtration, R.O.-membrane desalination, possible addition of sulfuric acid to maintain pH, and dechlorination. In addition, chemicals that do not include priority pollutants in its formulation may be added to prevent scaling and fouling of the R.O.-membrane. A process diagram for the Pilot Plant is included as Attachment A to this Order.

### **Intake and Discharge Description**

5. *Intake Location.* Bay water (raw saltwater) will be obtained through a pipeline installed on the deck of the Marin Rod & Gun Club pier, which runs parallel to the effluent discharge pipeline, at latitude 37 degrees 56 minutes 46.11 seconds North and longitude 122 degrees 28 minutes 25.33 seconds West. A screened intake will be suspended from the end of the Marin Rod & Gun Club pier, and is designed to comply with California Fish & Game requirements.
6. *Effluent Discharge Location.* Sludge and filter backwash are discharged to the local sanitary sewer. The overflows from the pretreatment processes, and the R.O. concentrate and permeate are recombined (the effluent) and discharged back into San Pablo Bay. The effluent is discharged through a pipeline also installed on Marin Rod & Gun Club pier. The effluent discharges approximately 500 feet from shore and approximately one-foot below mean low level through a T-pipe attached to the end of the pipeline. A map showing the location of the Pilot Plant and the effluent discharge location is included as Attachment B to this Order. Because this is a new discharge, data are not available to characterize the effluent discharge.
7. The United States Environmental Protection Agency (the U.S. EPA) and the Board have classified this discharge as a minor discharge.

### **Storm Water Discharge**

8. *Regulations.* Federal Regulations for storm water discharges were promulgated by the U.S. EPA on November 19, 1990. The regulations [40 CFR Parts 122, 123, and 124] require specific categories of industrial activity (industrial storm water) to obtain an NPDES permit and to implement Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to control pollutants in industrial storm water discharges.

9. *Exemption from Coverage under Statewide Storm Water General Permit.* The State Water Resources Control Board's (the State Board's) statewide NPDES permit for storm water discharges associated with industrial activities (NPDES General Permit CAS000001- the General Permit) was adopted on November 19, 1991, amended on September 17, 1992, and reissued on April 17, 1997. The Pilot Plant is not required to be covered under the General Permit, because desalination plants are not categorically required to obtain coverage.
10. *Site-Specific Storm Water Pollution Prevention Plan (SWPPP).* This Order requires the Discharger to develop and implement a site-specific SWPPP for preventing, controlling, and reducing pollutant discharges in storm water to the maximum extent practicable as specified in Provision 4 of this Order.

#### **Beneficial Uses**

11. The Basin Plan identifies the following beneficial uses for San Pablo Bay:

- Commercial and Sport Fishing
- Estuarine Habitat
- Industrial Service Supply
- Fish Migration
- Navigation
- Preservation of Rare and Endangered Species
- Water Contact Recreation
- Non-contact Recreation
- Shell Fish Harvesting
- Fish Spawning
- Wildlife Habitat

#### **Shallow Water Discharge Prohibition**

12. Basin Plan Section 4, Table 4-1 prohibits the discharge of wastewater that contains pollutants of concern and that does not receive a minimum initial dilution of at least 10:1, or into any nontidal water, dead-end slough, similar confined waters, areas or any immediate tributaries thereof (the 10:1 discharge prohibition).
13. The 10:1 discharge prohibition provides an added degree of protection from the continuous effects of wastewater discharges that contain pollutants of concern (i.e., oxygen depleting pollutants, acutely toxic pollutants, etc.). However, the Board finds that the discharge regulated by this Order is not subject to the 10:1 prohibition because it is essentially recombined bay water that is not expected to contain pollutants of concern.

#### **Reasonable Potential Analysis**

14. NPDES permits include effluent limits for all pollutants, which have the reasonable potential to cause or contribute to an exceedence of an applicable water quality standard (that have reasonable potential). Because this is a new discharge, data are not available at this time for a Reasonable Potential Analysis (RPA) using procedures in Section 1.3 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (the State Implementation Policy, or SIP).

15. This Order contains monitoring requirements, and if concentrations of any of these constituents increase to the extent that they have reasonable potential or otherwise impact or threaten to impact water quality, the Discharger will be required to investigate the source of the increases and establish remedial measures.

#### **Whole Effluent Acute Toxicity**

16. To ensure the manipulation of bay water by the Discharger does not introduce toxicity, this Order includes effluent limitations for whole effluent acute toxicity. Compliance evaluation is based on static renewal bioassay techniques using the most sensitive marine test species, and performed according to the most current U.S. EPA approved method in 40 CFR 136, currently "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water, 5th Edition."

#### **Studies Required for the Full-Scale Desalination Plant NPDES Permit Application**

17. To assess the permitability of a permanent desalination plant, the Provisions of this Order specify the following studies: Whole Effluent Toxicity Screening, Biological Resources Survey, and Salinity Study. These studies will be required as part of the NPDES permit application for a permanent desalination plant.
18. The Discharger may elect to conduct an Intake Water Credit Study. The results of the study may form the basis for intake credits in the NPDES permit issuance for the permanent desalination plant.

#### **Requirements for Monitoring of Pollutants in Effluent and Receiving Water to Implement new Statewide Regulations and Policy**

19. Board finds that the effluent and ambient background monitoring data are insufficient to determine reasonable potential and calculate numeric water quality-based effluent limitations (WQBELs) for the pollutants listed in the SIP.
20. On August 6, 2001, the Board sent a letter (hereinafter referred to as the Board's August 6, 2001 Letter) to all permitted dischargers pursuant to Section 13267 of the California Water Code requiring submittal of effluent data on priority pollutants and other toxic pollutants.
21. Pursuant to the Board's August 6, 2001 Letter attached to this Order (incorporated here by reference), the Discharger shall submit workplans and sampling results for characterizing the levels of selected pollutants in the brine as specified in Provision 2 of this Order.
22. The Self-Monitoring Program (SMP) attached to this Order (incorporated here by reference) requires effluent monitoring after the Pilot Plant's return pump at any point along the discharge pipe (E-001-D) for conventional, non-conventional, toxic pollutants, and acute toxicity. The SMP requires monitoring twice monthly of Total Suspended Solids and Total Dissolved Solids in the brine as an effective and relatively inexpensive method to evaluate the filtration processes performance. The SMP also requires the Discharger to conduct sampling twice annually of the brine pursuant to the requirements of the Board's August 6, 2001 Letter.

**NPDES Permit, Notification and Public Hearing**

23. *NPDES Permit.* This Order serves as an NPDES Permit, adoption of which is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code [California Environmental Quality Act (CEQA)] pursuant to Section 13389 of the California Water Code.
24. *CEQA.* On October 7, 2004, the Discharger filed a Notice of Exemption from the requirements of CEQA as this Pilot Plant project is an experimental testing activity that does not result in a serious or major disturbance to an environmental resource. The CEQA Notice of Exemption is included as Attachment E to this Order.
25. *Notification.* The Discharger and interested agencies and persons have been notified of the Board's intent to issue requirements for the Pilot Plant's discharge and have been provided an opportunity to submit their written views and recommendations. Board staff prepared a Fact Sheet and Response to Comments, which are hereby incorporated by reference as part of this Order.
26. *Public Hearing.* The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

**IT IS HEREBY ORDERED**, pursuant to the provisions of Division 7 of the California Water Code, regulations, and plans and policies adopted there under, and to the provisions of the Clean Water Act and regulations and guidelines adopted there under, that the Discharger shall comply with the following:

**A. DISCHARGE PROHIBITIONS**

1. The withdrawal of water from San Pablo Bay greater than 220,000 gallons per day or 150 gallons per minute, and greater than a velocity of 0.33 feet per second is prohibited unless it is pursuant to a specific request made by the Discharger and approved by the Executive Officer.
2. Discharge of sludge or filter backwash-water is prohibited.
3. Discharge at a location or in a manner different from that described in this Order is prohibited.

**B. EFFLUENT LIMITS**

The term "effluent" in the following limits means the recombined R.O. concentrate and permeate (drinking water) combined with the pretreatment-processes overflows.

**Conventional Pollutants**

1. The pH of the effluent discharge shall not exceed 8.5 nor be less than 6.0.
2. The effluent discharge shall not contain a chlorine residual concentration greater than 0.0 mg/L at any time.

### **Whole Effluent Acute Toxicity**

3. Representative samples of the effluent shall meet the following limits for acute toxicity. Compliance with these limits shall be achieved in accordance with Provision 3 of this Order.
  - a. The survival of bioassay test organisms in 96-hour static renewal bioassays of undiluted effluent shall be:
    - i. a 3-sample median value of not less than 90 percent survival, as defined in subsection b.i., below, and
    - ii. a single-sample maximum of not less than 70 percent survival, as defined in subsection b.ii., below. In the event that a bioassay test shows survival of less than 70 percent, the Discharger will be required to immediately cease discharge until the toxicity is eliminated.
  - b. These acute toxicity limits are further defined as follows:
    - i. If one of the past two or fewer samples shows less than 90 percent survival, then survival of less than 90 percent on the next sample represents a violation of the effluent limitation.
    - ii. Single-sample maximum: Any bioassay test showing survival of 70 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit.

### **C. RECEIVING WATER LIMITS**

1. The discharge of the effluent shall not cause the following conditions to exist in waters of the State at any place:
  - a. Floating, suspended, or deposited macroscopic particulate matter or foam;
  - b. Bottom deposits or aquatic growths to the extent that such deposits or growths cause nuisance or adversely affect beneficial uses;
  - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
  - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin; or
  - e. Toxic or other deleterious substances to be present in concentrations or quantities that cause exceedence of the narrative toxicity objective contained in the Basin Plan.
2. The discharge shall not cause pH variation from normal ambient pH by more than 0.5 pH units.

## **D. PROVISIONS**

### **1. Permit Compliance**

The Discharger shall comply with all sections of this Order beginning on the effective date of this Order.

### **2. Effluent Characterization for Selected Constituents**

The Discharger shall monitor and evaluate the discharge from Outfall E-001 for the constituents listed in Enclosure A of the Board's August 6, 2001 Letter (Attachment F). Compliance with this requirement shall be achieved in accordance with the specifications stated in the Board's August 6, 2001 Letter under Effluent Monitoring for minor dischargers. A final report that presents all the data shall be submitted as part of the NPDES permit application for the permanent desalination plant.

### **3. Acute Toxicity Testing**

The Discharger shall maintain compliance with acute toxicity requirements contained in this Order in accordance with the following:

- a. Compliance shall be based on 96-hour static renewal bioassays.
- b. The most sensitive species shall be determined from concurrent screenings, for at least three months, of two marine-species.
- c. Continuous testing
  - i. Continuous testing of both marine-species if toxicity is detected (<90% survival) in both species during the three month screening, or
  - ii. Continuous testing of the more sensitive of the two marine-species if no toxicity is detected.
- d. Bioassays shall be conducted in compliance with 40 CFR 136 methods, currently "Methods for Measuring The Acute Toxicity of Effluents and Receiving Water To Freshwater and Marine Organisms", 5th Edition (EPA-821-R-02-012), with exceptions that may be granted to the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP).
- e. Representative samples of the effluent shall be obtained according to the frequency specified in the attached SMP and on days coincident with process of applications of the antiscalant, if applicable.

### **4. Storm Water Pollution Prevention Plan (SWPPP)**

The Discharger shall submit and implement a SWPPP acceptable to the Executive Officer no later than 30 days after the effective date of this Order.

**5. Self-Monitoring Program**

The Discharger shall comply with the Self-Monitoring Program (Attachment C). The Self-Monitoring Program may be amended by the Executive Officer pursuant to U.S. EPA regulations 40 CFR 122.63.

**6. Standard Provisions and Reporting Requirements**

The Discharger shall comply with all applicable items (Items B.2, C, and D are not applicable) of the Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits, August 1993 (Attachment F), including any amendments thereto. Where provisions or reporting requirements specified in this Order are different from equivalent or related provisions or reporting requirements given in the Standard Provisions, the specifications of this Order shall apply.

**7. Whole Effluent Toxicity Screening Required for Full-Scale Desalination Plant NPDES Permit Application**

If the Discharger intends to apply for a permit for a permanent desalination facility, the Discharger must perform Whole Effluent screening phase monitoring for acute and chronic toxicity during this pilot study. Screening phase monitoring data must be included in the NPDES Permit application for the discharges that are likely to occur from the permanent desalination plant. The monitoring must be performed as required in the Chronic Toxicity Screening Phase Requirement (incorporated here by reference). The Chronic Toxicity Monitoring Screening Phase Requirements, Critical Life Stage Toxicity Tests and definitions of terms used in the chronic toxicity monitoring are identified in the Enclosure of the SMP. For acute toxicity, the two most sensitive species shall be determined from concurrent screenings, for at least three months, of three marine-species: a fish, an invertebrate, and an aquatic plant.

**8. Biological Resources Survey Required for Full-Scale Desalination Plant NPDES Permit Application**

If the Discharger intends to apply for a permit for a permanent desalination facility, the Discharger must conduct biological surveys. The purpose of this survey is to determine the abundance and composition of the aquatic species (plants, invertebrates, and fishes) located within or migrating through the zone of the intake. This information can be used to evaluate how the intake design of the permanent desalination plant will impact biological resources (entrainment and impingement); and to evaluate technologies to minimize these impacts. The Discharger may develop a study work plan and time schedule to investigate and analyze the aquatic species in the receiving water (the Biological Resources Survey), acceptable to the Executive Officer. A final report documenting the findings from the Biological Resources Survey must be included in the NPDES Permit application for the permanent desalination plant. If the Discharger conducts the Biological Resources Survey as part of an Environmental Impact Report (EIR) for a full-scale desalination plant, the Discharger shall submit the Draft EIR to the Executive Officer for review.

**9. Optional Intake Water Credit Study**

If the Discharger intends to apply for a permit for a permanent desalination facility, the Discharger may conduct an intake water credit study during this pilot study. The results of the study may form the basis for intake credits in the NPDES permit issuance for the permanent desalination plant. The study must be sufficient to characterize the quality of the intake water, and must comprise of all priority pollutants for which intake credits will be sought. The study must be conducted for a duration of not less than six months, must address possible temporal fluctuations, and must be in accordance with appropriate methods such as those described in the Board's August 6, 2001 Letter.

**10. Salinity Study Required for Full-Scale Desalination Plant NPDES Permit Application**

If the Discharger intends to apply for a permit for a permanent desalination facility, the Discharger must conduct a salinity study during this pilot study. Salinity may be indirectly measured by conductivity. The purpose of this study is to predict the salinity range of the discharge (including the R.O. concentrate) from the permanent desalination plant, and to evaluate if the salinity will impact biological resources, and evaluate mitigation of these impacts (e.g., discharge in combination with freshwater, such as wastewater treatment plant effluent). A final report documenting the findings from the Salinity Study must be included in the NPDES Permit application for the permanent desalination plant.

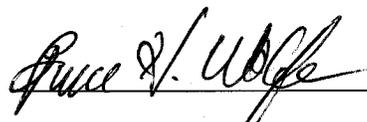
**11. NPDES Permit Effective Date**

This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become effective on March 17, 2005, provided the U.S. EPA Regional Administrator has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

**12. Order Expiration**

This Order expires on March 31, 2006. The Executive Officer may extend this expiration date only if the Discharger makes a request justified on the need to collect additional data to resolve design or permitting issues for the permanent desalination plant.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 16, 2005.



BRUCE H. WOLFE  
EXECUTIVE OFFICER

**Attachments:**

- A. Discharge Facility Treatment Process Diagram

Marin Municipal Water District Desalination Pilot Plant  
NPDES Permit No. CA0038814  
Order No: R2-2005-0006

- B. Discharge Facility Location Map
- C. Self-Monitoring Program, Part B
- D. Fact Sheet
- E. CEQA Notice of Exemption
- F. The following documents are part of this Permit, but are not physically attached due to volume. They are available on the internet at [www.waterboards.ca.gov/sanfranciscobay/Download.htm](http://www.waterboards.ca.gov/sanfranciscobay/Download.htm)
  - Self-Monitoring Program, Part A, adopted August 1993
  - Standard Provisions and Reporting Requirements, August 1993
  - August 6, 2001 Board Staff Letter: *Requirement for Priority Pollutant Monitoring in Receiving Water and Wastewater Discharges*

Marin Municipal Water District Desalination Pilot Plant  
NPDES Permit No. CA0038814  
Order No: R2-2005-0006

Attachment A.  
Discharge Facility Treatment Process Diagram



Marin Municipal Water District Desalination Pilot Plant  
NPDES Permit No. CA0038814  
Order No: R2-2005-0006

Attachment B.  
Discharge Facility Location Map



SCALE: 1" = 100'

**SUBMITTAL FOR APPROVAL**

<b>USE OF DOCUMENTS</b> THIS DOCUMENT IS THE PROPERTY OF THE CITY OF SAN FRANCISCO AND IS TO BE RETURNED TO THE CITY OF SAN FRANCISCO UPON REQUEST.	TR-01-K, Reynolds C39839	Kennedy/Jenks Consultants Engineers & Architects In association with CH2M HILL	MARIEN MUNICIPAL WATER DISTRICT <b>SEAWATER DESALINATION PILOT PLANT PROGRAM</b> Kennedy/Jenks Consultants 1000 MARKET STREET, SUITE 1000, SAN FRANCISCO, CA 94102	SHEET NO. <b>G-3</b>

Marin Municipal Water District Desalination Pilot Plant  
NPDES Permit No. CA0038814  
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Attachment C.  
Self-Monitoring Program, Part B

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD**

**SAN FRANCISCO BAY REGION**

**SELF-MONITORING PROGRAM**

**FOR**

**MARIN MUNICIPAL WATER DISTRICT**

**DESALINATION PILOT PLANT**

**SAN RAFAEL, MARIN COUNTY**

**NPDES PERMIT NO. CA0038814**

**ORDER NO. R2-2005-0006**

**Consists of:**

**Part A, Adopted August 1993  
(Not attached)**

**And**

**Part B, Effective March 17, 2005**

**(Attached)**

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## I. Station Descriptions

<u>Station</u>	<u>Description</u>
INFLUENT A-001	At any point in the Marin Municipal Water District Desalination Pilot Plant's (the Pilot Plant) Seawater Holding tank at which all source water is present, and prior to any phase of treatment.
EFFLUENT E-001	At any point in the reverse osmosis concentrate (brine) pipelines, after the reverse osmosis desalination process, and prior to blending with the return waters.
E-001-D	At any point in the discharge pipe after the Pilot Plant's Return Water Pump at which all effluent tributary to that discharge pipe is present, and where adequate dechlorination is assured.

## II. Schedule Of Sampling, Analyses And Observations

The schedule of sampling and analysis shall be that given in Table 1, below. Sampling and analysis of additional constituents is required pursuant to the Water Board's August 6, 2001 Letter titled *Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy*. This additional pollutant monitoring of the brine shall be carried out twice annually until the Discharger's application for reissuance of this NPDES permit.

Table 1. Schedule Of Sampling and Analyses.

SAMPLING STATION	Notes	A-001		E-001		E-001-D	
		G	C-24 [1]	G	C-24 [1]	G	C-24 [1]
Temperature (°F)		5/W					
Flow Rate (mgd)	[2]		Cont.				Cont.
Conductivity (µmhos/cm)		2/M		2/M			
Total Suspended Solids (mg/L)			2/M		2/M		2/M
Total Dissolved Solids (mg/L)		2/M			2/M	2/M	
pH (standard units)	[3]	5/W				5/W	
Total Chlorine Residual (mg/L)	[4]					Cont. or hourly	
Acute Toxicity (% survival)	[5]				2/Y	M	

### LEGEND FOR TABLE 1

Types of Samples:

C-24= composite sample, 24-hour (includes continuous sampling, such as for flows)

Cont.= continuous sampling

G= grab sample

Frequency of Sampling:

Cont. = continuous monitoring  
M = once each month  
2/M = twice each month  
5/W = five days per week

Parameter and Unit Abbreviations

TSS = Total Suspended Solids  
mgd = million gallons per day  
g/L = grams per liter  
mg/L = milligrams per liter  
(µmhos/cm) = micromhos per centimeter

**FOOTNOTES FOR TABLE 1**

- [1] Composite sampling: 24-hour composites may be made up of discrete grabs collected over the course of a day and volumetrically or mathematically flow-weighted. Samples for inorganic pollutants may be combined prior to analysis. If only one grab sample will be collected, it should be collected during periods of maximum peak flows. Samples shall be taken on random days.
- [2] Flow Monitoring: Effluent flows shall be measured continuously at Outfalls A-001 and E-001, and recorded and reported daily
- [3] Daily minimum and maximum for pH shall be reported.
- [4] Chlorine Residual Monitoring: During all times when chlorination is used for disinfection of the effluent, effluent chlorine residual concentrations shall be monitored continuously, or by grab samples taken hourly. Chlorine residual concentrations shall be monitored and reported for sampling points both prior to and following dechlorination. Total chlorine dosage (mg/l & kg/day) shall be recorded on a daily basis.
- [5] Acute Toxicity:  
E-001: Reverse osmosis concentrate (brine) shall be combined with wastewater effluent from the Central Marin Sanitation Agency at various concentrations to evaluate toxicity.

E-001-D: Effluent used for fish bioassays must be dechlorinated prior to testing. Monitoring of the bioassay water shall include, on a daily basis, the following parameters: pH, dissolved oxygen, ammonia nitrogen, and temperature. These results shall be reported. If a violation of acute toxicity requirements occurs, a new bioassay test shall be started as soon as practicable and testing should continue back to back until compliance is demonstrated.

**III. Recording Requirements**

- A. General Recording Requirements are described in Section E of Part A of the Self-Monitoring Program.
- B. Any overflow without adequate treatment discharged into the receiving water, or significant non-compliance incident shall be recorded according to Sections E.1. and E.2. of Part A.

**IV. Reporting Requirements**

- A. General Reporting Requirements are described in Section E of the Board's *Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits*, dated August 1993, and Part A of the Self-Monitoring Program.
- B. Modifications to Self-Monitoring Program, Part A:
1. If any discrepancies exist between Part A and Part B of the SMP, Part B prevails.
  2. Modify Section F.1 as follows:

### Spill Reports

A report shall be made of any spill of oil or other hazardous material. The spill shall be reported by telephone as soon as possible and no later than 24 hours following occurrence or discharger's knowledge of occurrence. Spills shall be reported by telephone as follows:

During weekdays, during office hours of 8 am to 5 pm, to the Board: Current telephone number: (510) 622 - 2300, (510) 622-2460 (FAX).

During non-office hours, to the State Office of Emergency Services: Current telephone number: (800) 852 - 7550.

A report shall be submitted to the Board within five (5) working days following telephone notification, unless directed otherwise by Board staff. A report submitted by facsimile transmission is acceptable for this reporting.

3. Modify Section F.4 as follows:

#### Self-Monitoring Reports

For each calendar month, a self-monitoring report (SMR) shall be submitted to the Board in accordance with the requirements listed in Self-Monitoring Program, Part A. The purpose of the report is to document treatment performance, effluent quality and compliance with waste discharge requirements prescribed by this Order, as demonstrated by the monitoring program data and the Discharger's operation practices. The report shall be submitted to the Board by the first day of the second month after the month being reported on.

4. Add at the end of Section F.5, Annual Reporting, the following:

- d. A plan view drawing or map showing the Dischargers' facility, flow routing and sampling and observation station locations.
5. The Discharger is not subject to the requirements of Sections C.3 Storm Water, C.4 Receiving Waters, C.5 Bottom Sediment Samples and Sampling and Reporting Guidelines, D.2 Wastewater Effluent, D.3 Beach and Shoreline, D.4 Land Retention and Disposal Area, and D.5 Periphery of Waste Treatment and/or Disposal Facilities, of Part A of the SMP, which are not applicable to the Discharger's operation.

## V. Self-Monitoring Program Certification

I, Bruce H. Wolfe, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order No. R2-2005-0006.
2. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Discharger, and revisions will be ordered by the Executive Officer.

3. Is effective as of March 17, 2005.

A handwritten signature in black ink, appearing to read "Bruce H. Wolfe", is written over a horizontal line.

Bruce H. Wolfe,  
Executive Officer

**Enclosure:**

Chronic Toxicity – Definition of Terms and Screening Phase Requirements

**CHRONIC TOXICITY**  
**DEFINITION OF TERMS & SCREENING PHASE REQUIREMENTS**

**I. Definition of Terms**

- A. No observed effect level (NOEL) for compliance determination is equal to  $IC_{25}$  or  $EC_{25}$ . If the  $IC_{25}$  or  $EC_{25}$  cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.
- B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Kärber.  $EC_{25}$  is the concentration of toxicant (in percent effluent) that causes a response in 25% of the test organisms.
- C. Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal, non-quantal biological measurement, such as growth. For example, an  $IC_{25}$  is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as EPA's Bootstrap Procedure.
- D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

**II. Chronic Toxicity Screening Phase Requirements**

- A. The discharger shall perform screening phase monitoring:
1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to pretreatment, source control, and waste minimization efforts, or
  2. Prior to Permit issuance. Screening phase monitoring data shall be included in the NPDES Permit application for issuance. The information shall be as recent as possible.
- B. Design of the screening phase shall, at a minimum, consist of the following elements:
1. Use of test species specified in Tables 1 and 2 (attached), and use of the protocols referenced in those tables, or as approved by the Executive Officer;
  2. Two stages:
    - a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Table 1 (attached); and
    - b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.
  3. Appropriate controls; and
  4. Concurrent reference toxicant tests.
- C. The discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

**TABLE C 1**  
**CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS**

SPECIES	SCIENTIFIC NAME	EFFECT	TEST DURATION	REFER- ENCE
alga	( <u>Skeletonema costatum</u> )	growth rate	4 days	1
	( <u>Thalassiosira pseudonana</u> )	growth rate		
red alga	( <u>Champia parvula</u> )	number of cystocarps	7-9 days	3
giant kelp	( <u>Macrocystis pyrifera</u> )	percent germination; germ tube length	48 hours	2
abalone	( <u>Haliotis rufescens</u> )	abnormal shell development	48 hours	2
oyster	( <u>Crassostrea gigas</u> )	abnormal shell development;	48 hours	2
mussel	( <u>Mytilus edulis</u> )	percent survival		2
echinoderms		percent fertilization	1 hour	2
urchins	( <u>Strongylocentrotus purpuratus, S. franciscanus</u> )	percent fertilization	1 hour	2
sand dollar	<u>Dendraster excentricus</u>	percent fertilization	1 hour	2
shrimp	( <u>Mysidopsis bahia</u> )	percent survival; growth; fecundity	7 days	3
silversides	( <u>Menidia beryllina</u> )	larval growth rate; percent survival	7 days	3

**Toxicity Test References:**

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for conducting static 96-hour toxicity tests with microalgae. Procedure E 1218-90. ASTM Philadelphia, PA.
2. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms. USEPA\600\R-95\136. 1995.
3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms as specified in 40CFR 136. Currently, this is USEPA/600/4-90/003, July 1994. Later editions may replace this version.

**TABLE C 2**  
**CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS**

SPECIES REFERENCE	(Scientific name)	EFFECT	TEST DURATION	
fathead minnow	( <u>Pimephales promelas</u> )	survival; growth rate	7 days	6
water flea	( <u>Ceriodaphnia dubia</u> )	survival; number of young	7 days	6
alga	( <u>Selenastrum capricornutum</u> )	cell division rate	4 days	6

**Toxicity Test Reference:**

6. Horning, W.B. and C.I. Weber (eds.). 1989. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. Second edition. U.S. EPA Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. EPA/600/4-89/001.
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Marin Municipal Water District Desalination Pilot Plant  
NPDES Permit No. CA0038814  
Order No: R2-2005-0006

Attachment D.  
Fact Sheet

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

1515 CLAY STREET, SUITE 1400

OAKLAND, CA 94612

(510) 622 – 2300 Fax: (510) 622 - 2460

**FACT SHEET**

for

NPDES PERMIT and WASTE DISCHARGE REQUIREMENTS for

**MARIN MUNICIPAL WATER DISTRICT's**

**DESALINATION PILOT PLANT**

SAN RAFAEL, MARIN COUNTY

**NPDES Permit No. CA0038814**

**ORDER NO. R2-2005-0006**

**PUBLIC NOTICE:**

**Written Comments**

- Interested persons are invited to submit written comments concerning this draft permit.
- Comments must be submitted to the Board no later than 5:00 p.m. on March 2, 2005.
- Send comments to the Attention of Gayleen Perreira.

**Public Hearing**

- The draft permit will be considered for adoption by the Board at a public hearing during the Board's regular monthly meeting at: Elihu Harris State Office Building, 1515 Clay Street, Oakland, CA; 1<sup>st</sup> floor Auditorium.
- This meeting will be held on: March 16, 2005, starting at 9:00 a.m.

**Additional Information**

- For additional information about this matter, interested persons should contact Board staff member: Ms. Gayleen Perreira, Phone: (510) 622-2407; email: [gperreira@waterboards.ca.gov](mailto:gperreira@waterboards.ca.gov).

This Fact Sheet contains information regarding the issuance of waste discharge requirements and National Pollutant Discharge Elimination System (NPDES) permit for the Marin Municipal Water

District for discharge primarily of recombined bay water. The Fact Sheet describes the factual, legal, and methodological basis for the sections addressed in the proposed permit and provides supporting documentation to explain the rationale and assumptions used in deriving the effluent limitations.

## I. INTRODUCTION

- A. On December 31, 2004, the Marin Municipal Water District (the Discharger) applied to the Board for issuance of waste discharge requirements and a permit to discharge recombined reverse osmosis permeate and concentrate, mixed with overflows (consisting of bay water and pretreated bay water) from the temporary desalination plant to waters of the State and the United States under the National Pollutant Discharge Elimination System (NPDES).
- B. The Discharger is a public water supply and management agency that is responsible for providing drinking water to over 170,000 consumers in the eastern corridor of southern Marin County, and manages over 38,000 acres of watershed, which includes seven reservoirs. The Discharger's current water supply capacity operates at a 10% deficit, which exists despite the Discharger's long-standing and comprehensive conservation and water-recycling program that reduced per capita potable water use by 25%. The Discharger estimates that the deficit will grow to 20% by the year 2020, and therefore is investigating the feasibility of producing drinking water from bay water through the continuous operation of a temporary reverse osmosis desalination plant (the Pilot Plant) to supplement its source water supply.
- C. The Pilot Plant will be in operation for approximately nine months, and is located at 2675 Francisco Boulevard East, San Rafael. The Pilot Plant will withdraw water from the bay, filter the bay water in one of three pretreatment systems, and then desalt the bay water in a seawater reverse osmosis skid. After the Discharger evaluates the efficacy of the treatment processes to produce drinking water that meets both the Discharger's and regulatory standards, the reverse osmosis permeate (drinking water) and concentrate (brine) are recombined with overflows (consisting of bay water and pretreated bay water), and discharged (returned) to the bay. The sludge produced from the pretreatment processes is discharged to the local sanitary sewer, and therefore the discharge to the receiving water should be of higher quality.
- D. The Pilot Plant will withdraw, process, and discharge an average of 180,000 gallons per day (gpd) at a flow rate of 125 gallons per minute (gpm). The bay water is drawn from San Pablo Bay through a screened intake that will be suspended from the end of the Marin Rod & Gun Club pier (A-001). At high tides the intake and discharge rate may increase slightly, and at high-high tides the intake pump may increase to no more than 150 gpm or 216,000 gpd. The fish screens will be sized for this maximum flow, with 3/32-inch openings and at a maximum velocity of 0.33 feet per second (fps).

## II. TREATMENT PROCESS DESCRIPTION

- A. The treatment processes for the bay water will consist of three trains of equipment that will be operated in parallel. The first equipment train is a conventional treatment system that consists of a Lamella high-rate clarifier, two-stage granular media filters, and a seawater reverse osmosis skid. The second and third equipment trains are membrane microfiltration treatment systems; one is a USF Memcor CMFS unit and the other is the Zenon Z-1000 unit. The filtrate from both the second and third equipment trains, which are the membrane microfiltration systems, will be desalted in a single seawater reverse osmosis skid. All the sludge and filter backwash water will be discharged to the local sanitary sewer system, and all the overflows (consisting of bay water and pretreated bay water) will be piped to the Pilot Plant's return water tank.

- B. The Discharger's treatment process consists of periodic chlorination, pretreatment, conventional filtration or submerged-membrane microfiltration, reverse osmosis-membrane desalination, possible addition of sulfuric acid to maintain pH, and dechlorination. In addition, chemicals may be added to prevent scaling and fouling of the reverse osmosis-membranes.

### III. DESCRIPTION OF INFLUENT AND EFFLUENT

- A. Bay water (raw saltwater) will be obtained through a pipeline installed on the deck of the Marin Rod & Gun Club pier, which runs parallel to the effluent discharge pipeline, at latitude 37 degrees 56 minutes 46.11 seconds North and longitude 122 degrees 28 minutes 25.33 seconds West (A-001). A screened intake will be suspended from the end of the Marin Rod & Gun Club pier, and is designed to comply with California Fish & Game requirements.
- B. After the Discharger evaluates the efficacy of the three trains of equipment to produce drinking water from the raw saltwater, the reverse osmosis permeate and concentrate are piped to the return water tank and combined with the overflows (the effluent).
- C. The effluent is discharged back into San Pablo Bay, a water of the State and the United States, through an additional pipeline installed on the deck of the Marin Rod & Gun Club pier (E-001-D). The effluent discharges approximately 500 feet from shore and approximately one-foot below mean low level through a T-pipe attached to the end of the pipeline. Because this is a new discharge, data is not available to characterize the effluent discharge.
- D. All the sludge and filter backwash are discharged to the local sanitary sewer system.
- E. The United States Environmental Protection Agency (the U.S. EPA) and the Board have classified this discharge as a minor discharge.

### IV. RECEIVING WATERS

- A. *Beneficial Uses.* Table 2-7 of the Board's June 21, 1995, *Water Quality Control Plan San Francisco Bay Basin (Region 2)* (the Basin Plan), and observation of known uses of the San Pablo Bay (the receiving water) in the vicinity of the subject discharge, have identified the following beneficial uses for San Pablo Bay:
- Commercial and Sport Fishing
  - Estuarine Habitat
  - Industrial Service Supply
  - Fish Migration
  - Navigation
  - Preservation of Rare and Endangered Species
  - Water Contact Recreation
  - Non-contact Recreation
  - Shell Fish Harvesting
  - Fish Spawning
  - Wildlife Habitat
- B. *Shallow Water Discharge Prohibition.* Basin Plan Section 4, Table 4-1 prohibits the discharge of wastewater that contains pollutants of concern and that does not receive a minimum initial dilution of

at least 10:1, or into any nontidal water, dead-end slough, similar confined waters, areas or any immediate tributaries thereof (the 10:1 discharge prohibition).

The 10:1 discharge prohibition provides an added degree of protection from the continuous effects of wastewater discharges that contain pollutants of concern (i.e. oxygen depleting pollutants, acutely toxic pollutants, etc.). However, the Board finds that the discharge regulated by this Order is not subject to the 10:1 prohibition because it is essentially recombined bay water that is not expected to contain pollutants of concern.

## V. GENERAL RATIONALE AND REGULATORY BASES

The limitations and requirements contained in this Order are based on:

- the Federal *Water Pollution Control Act*, Sections 301 through 305, and 307, and amendments thereto, as applicable (the Clean Water Act – the CWA);
- the Board's June 21, 1995 *Water Quality Control Plan San Francisco Bay Basin (Region 2)* (the Basin Plan), and amendments thereto, as subsequently approved by the State Water Resources Control Board (the State Board), the Office of Administrative Law (OAL) and the U.S. EPA;
- the State Water Resource Control Board's (the State Board's) March 2, 2000 *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (the State Implementation Plan - the SIP), as subsequently approved by the OAL and the U.S. EPA;
- the U.S. EPA's May 18, 2000 *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California* (the California Toxics Rule – the CTR);
- the U.S. EPA's National Toxics Rule as promulgated [Federal Register Volume 57, 22 December 1992, page 60848] and subsequently amended (the NTR);
- the U.S. EPA's *Quality Criteria for Water* [EPA 440/5-86-001, 1986], and subsequent amendments, (the U.S. EPA Gold Book);
- applicable Federal Regulations [40 CFR Parts 122 and 131];
- 40 CFR Part 131.36(b) and amended [Federal Register Volume 60, Number 86, 4 May 1995, pages 22229-22237];
- the U.S. EPA's December 10, 1998 *National Recommended Water Quality Criteria* compilation [Federal Register Vol. 63, No. 237, pp. 68354-68364];
- the U.S. EPA's December 27, 2002 *Revision of National Recommended Water Quality Criteria* compilation [Federal Register Vol. 67, No. 249, pp. 79091-79095]; and
- guidance provided with State Board actions remanding permits to the Board for further consideration.

## VI. SPECIFIC RATIONALE

Specific factors affecting development of limitations and requirements in this Order are discussed as follows:

#### **A. Basis for Prohibitions**

1. Prohibition A.1 (intake limit): The purpose of this prohibition is to protect the beneficial uses of the receiving water. This prohibition is based on the Pilot Plant's design criteria submitted in the Discharger's NPDES Permit application package, an email (1/13/05) from Vicky Frey, Environmental Scientist for the California Department of Fish and Game, and best professional judgment. This permit is for the Discharger's experimental desalination prototype plant that requires minimal intake of bay water supply (the intake limits), and therefore entrainment studies, biological resources studies, and sensitivity and toxicity screenings are not required for issuance of this permit. However, intake of bay water in amounts greater than the intake limits of 220,000 gallons per day or 150 gallons per minute, and greater than a velocity of 0.33 feet per second potentially may cause deleterious effects to aquatic life within the vicinity of the intake pipe and therefore, at a minimum, these studies would be required to be performed by the Discharger and reviewed by regulatory agencies before a permit would be granted. Based on staff's best professional judgment, these intake limits established in the prohibition are technically achievable and necessary to protect the receiving water.
2. Prohibition A.2 (no discharges of sludge or filter backwash): This prohibition is intended to prevent discharging pollutants of concern into the receiving water. This prohibition is based on the Pilot Plant's design criteria submitted in the Discharger's NPDES Permit application package, and the Basin Plan's objective on sediment and objectives to prevent deleterious effects to receiving waters from discharges that contain pollutants of concern. This prohibition is necessary to ensure that these objectives are protected. In the permit application package, the Discharger committed to discharging all sludge and filter backwash to the local sanitary sewer system; as a result, the effluent discharge into San Pablo Bay should be comprised primarily of bay water of higher quality. This Order allows the effluent discharge into the receiving water without a 10:1 dilution only because the discharge should not contain pollutants of concern, of which most are to be extracted during the treatment processes and discharged to the local sanitary sewer system.
3. Prohibition A.3 (no discharge at a location or in a manner different from that described in this Order): This prohibition is based on the Basin Plan to protect beneficial uses of the receiving water from un-permitted discharges, and of the California Water Code that requires filing of a report of waste discharge before a permit to discharge can be granted.

#### **B. Basis for Effluent Limitations**

1. Effluent Limitations B.1 and B.2 (pH and chlorine residual limits): These limitations are based on Basin Plan objectives requirements [Basin Plan Chapter 4, Table 4-2, at pg 4-69], which is derived in turn from federal requirements [40 CFR 133.102], and best professional judgment. These technology-based limitations are representative of, and are intended to ensure, adequate and reliable treatment. While these limits were developed primarily for sewage treatment facilities, they are also applicable to other discharges. The Discharger is periodically chlorinating the water, and may add sulfuric acid to maintain the pH. Based on staff's best professional judgment, these limits are technically achievable, economically feasible, necessary to protect the receiving water, and are generally consistent with limits in permits for similar industries.

2. Effluent Limitation B.3 (Whole Effluent Acute Toxicity): The Basin Plan specifies a narrative objective for toxicity, requiring that all waters shall be maintained free of toxic substances in concentrations that are lethal to, or produce other detrimental response in, aquatic organisms. Detrimental responses include, but are not limited to: decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alternations in population, community ecology, or receiving water biota. To ensure that the manipulation of bay water by the Discharger does not introduce toxicity, these whole effluent toxicity limitations are necessary to ensure that the Basin Plan's objective is protected. The whole effluent acute toxicity limitations for a three-sample median and an eleven-sample 90<sup>th</sup> percentile value are based on the Basin Plan [Table 4-4, pg. 4-70]. This Order requires acute toxicity testing using the most sensitive marine bioassays, determined through the specifications in Provision 3 of this Order, and to be carried out consistent with the requirements of the U.S. EPA's "Methods for Measuring The Acute Toxicity of Effluents and Receiving Water To Freshwater and Marine Organisms." The most current requirements are the 5th Edition (EPA-821-R-02-012), and the Discharger shall implement succeeding editions as soon as practicable after their adoption by U.S. EPA.

### C. Basis for Receiving Water Limitations

Receiving water limitations C.1 and C.2 (conditions to be avoided): These limitations are based on the narrative/numerical objectives contained in Chapter 3 of the Basin Plan, pages 3-2 – 3-5.

### D. Basis for Provisions

1. Provision E.1. (Permit Compliance): Time of compliance is based on 40 CFR 122.
2. Provision E.2. (Effluent Characterization for Selected Constituents): Reasonable potential could not be determined for priority pollutants due to the lack of data. The purpose of this requirement is to provide discharge data that are sufficient for Board staff to determine if water quality-based effluent limitations for priority pollutants are required. This provision is based on regulations contained in the SIP, which was promulgated by the CTR. The Board's August 6, 2001 Letter to all permittees required dischargers to initiate or continue to monitor for those pollutants in this category, using analytical methods that provide the best detection limits reasonably feasible. This Order requires the Discharger to monitor and evaluate priority pollutants during the effective period of this Order in accordance with the specifications stated in the Board's August 6, 2001 Letter under Effluent Monitoring for minor Dischargers. This provision requires the data and the final report to be submitted as part of the NPDES permit application for the permanent desalination plant or reissuance of this permit. Based on Board staff's best professional judgment, we believe these monitoring requirements are technically achievable and economically feasible, necessary to protect the receiving water, and are consistent with requirements for dischargers in similar industries.
3. Provision E.3 (Whole Effluent Acute Toxicity): This provision establishes conditions by which compliance with permit effluent limitations for acute toxicity will be demonstrated. The Basin Plan requires compliance of acute toxicity limitations to be evaluated, at a minimum, using the most sensitive species determined from concurrent screenings of two species (Chapter 3 and 4), if toxicity has been observed in only one of the two species. To ensure that the Basin Plan's

objectives are protected, this Order requires the Discharger to use the most sensitive marine test species determined from concurrent screenings, conducted for at least three months, of two marine-species, should toxicity only be observed in one of the test species; otherwise, the Discharger continues testing of both marine-species. This provision also requires the bioassays be conducted in compliance with the protocols in 40 CFR Part 136, currently "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms," 5<sup>th</sup> Edition (EPA-821-R-02-012). Based on the Basin Plan and Board staff's best professional judgment, these monitoring requirements are technically achievable and economically feasible, and are necessary to protect the receiving water.

4. Provision E.4 (Storm Water Pollution Prevention Plan): This provision is based upon 40 CFR 122.44(k), and best professional judgment. The purpose of this provision is to protect receiving waters from chemical spills or leakages, and is intended to prevent discharge of chemicals to the receiving water through the conveyance of storm water runoff. This provision requires the Discharger to implement best management practices, pollution prevention measures, and emergency response procedures. While the Discharger is categorically exempt to obtain a permit for storm water discharges (40 CFR 122.26(b)(14)), the Pilot Plant will be established on an existing parking lot that has storm drain inlets that discharge to waters of the State. During the Pilot Plant project, the Discharger will store and handle hazardous chemicals (chlorine, sulfuric acid, and antiscalants) that could potentially spill, or leak, and discharge to waters of the State via storm water runoff. Based upon staff's best professional judgment, we believe that this provision is necessary to protect the receiving water.
5. Provision E.5. (Self-Monitoring Program): The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions, and to provide data to determine if water quality-based effluent limitations for priority pollutants are necessary. Reasonable potential could not be determined for priority pollutants due to the lack of data, and therefore monitoring requirements are contained in the Self Monitoring Program (SMP) of the Permit. The Discharger is also required to conduct monitoring of the reverse osmosis concentrate to determine the salinity range. This provision requires compliance with the SMP, and is based on 40 CFR 122.44(i), 122.62, 122.63 and 124.5. The SMP is a standard requirement in almost all NPDES permits issued by the Board, including this Order. It contains definitions of terms, specifies general sampling and analytical protocols, and sets out requirements for reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and the Board's policies. The SMP also contains a sampling program specific for the facility. It defines the sampling stations and frequency, the pollutants to be monitored, and additional reporting requirements.
6. Provision E.6. (Standard Provisions and Reporting Requirements): The purpose of this provision is to require compliance with applicable standard provisions and reporting requirements given in this Board's document titled *Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits, August 1993* (the Standard Provisions), or any amendments thereafter. That document is incorporated in the permit as an attachment to it. The Standard Provisions are a standard requirement in almost all NPDES permits issued by the Board, including this Order. Where provisions or reporting requirements specified in the permit are different from equivalent or related provisions or reporting requirements given in the Standard Provisions, the permit specifications shall apply. The standard provisions and reporting requirements given in the above document are based on various state and federal regulations with specific references cited therein.

7. Provision E.7 (Whole Effluent Toxicity Screening Required for Full-Scale Desalination Plant NPDES Permit Application): If the Discharger intends to apply for a permit for a permanent desalination facility, this provision requires the Discharger to conduct whole effluent acute and chronic toxicity screening phase monitoring requirements during this pilot study for a permanent desalination plant, if the monitoring data is obtained from discharges that are likely to occur at permanent desalination plant. This screening phase monitoring is important to help determine which test species is most sensitive to the toxicity of the effluent for future compliance monitoring, and therefore screening phase monitoring data must be included in the NPDES Permit application for the permanent desalination plant. The proposed conditions for chronic and acute toxicity screening phase monitoring requirements are based on the whole effluent toxicity limitations specified in the Basin Plan (Chapter 4), and best professional judgment.
8. Provision E.8 (Biological Resources Survey Required for Full-Scale Desalination Plant NPDES Permit Application): If the Discharger intends to apply for a permit for a permanent desalination facility, this provision requires the Discharger to conduct a survey of the plants, invertebrates, and fishes (biological resources) located within, or migrating through, the zone of the intake. Because the intake volume will increase substantially for a permanent desalination plant, this Order requires a study of the impacts (impingement or entrainment) to biological resources from the intake to be included in the NPDES Permit application for the permanent desalination plant, in order to determine what, if any, permit requirements are needed to protect those beneficial uses. This provision is based on the Basin Plan objectives (Chapter 3 and 4), conversations with Environmental Scientists, Vicky Frey from California Department of Fish and Game, and Korie Schaeffer, from U. S. National Oceanic and Atmospheric Administration (NOAA), and best professional judgment.
9. Provision E.9 (Optional Intake Credit Study): This provision allows the Discharger to conduct an intake water credit study during this pilot study. The study must be sufficient to characterize the quality of the intake water, must comprise of all priority pollutants for which intake credits will be sought, must be conducted for a duration of not less than 6 month, must address possible temporal fluctuations, and must be and in accordance with appropriate methods such as those described in the Board's August 6, 2001 Letter. The purpose of this provision is to provide intake water and receiving water data, of which the results of the study may form the basis for intake credits in the NPDES permit issuance for the permanent desalination plant. This provision is not required if the Discharger does not wish Board staff to consider the appropriateness of intake water credits. This provision is based on regulations contained in the SIP, which was promulgated by the CTR.
10. Provision E.10 (Salinity Study Required for Full-Scale Desalination Plant NPDES Permit Application): If the Discharger intends to apply for a permit for a permanent desalination facility, this provision requires the Discharger to conduct a salinity study during this pilot study. Salinity may be indirectly measured by conductivity. The purpose of this study is to predict the salinity range of the discharge (including the R.O. concentrate) from the permanent desalination plant, and to evaluate if the salinity will impact biological resources, and evaluate mitigation of these impacts (e.g. discharge in combination with freshwater, such as wastewater treatment plant effluent).
11. Provision E.11 (NPDES Permit /the U.S. EPA concurrence): This provision is based on 40 CFR 123.

12. Provision E.12 (Permit Expiration and Reapplication): This provision is based on 40 CFR 122.46(a).

## **VII. WASTE DISCHARGE REQUIREMENT APPEALS**

Any person may petition the State Water Resources Control Board to review the decision of the Board regarding the Waste Discharge Requirements. A petition must be made within 30 days of the Board public hearing.

Marin Municipal Water District Desalination Pilot Plant  
NPDES Permit No. CA0038814  
Order No: R2-2005-0006

Attachment E.  
CEQA Notice of Exemption

**NOTICE OF EXEMPTION**

(Ref. California Environmental Quality Act Guidelines Sec. 15300)

**FILED**

**TO:** County Clerk  
 Marin County Civic Center  
 3501 Civic Center Drive San  
 Rafael, CA 94903

**From:** Marin Municipal Water District 220  
 Neffes Avenue  
 Corte Madera, CA 94925

OCT 07 2004

**MICHAEL J. SMITH**  
**MARIN COUNTY CLERK**  
*By: J. Whitney, Deputy*

**PROJECT TITLE: PILOT DESALINATION PLANT PROJECT**

**PROJECT LOCATION - SPECIFIC:** Point San Quentin Property of Marin Rod and Gun Club, Inc.  
 (A.P. No. 090-170-01, 06 & 09)

**PROJECT LOCATION - CITY**

San Rafael

**PROJECT LOCATION - COUNTY**

Marin

**DESCRIPTION OF NATURE, PURPOSE, AND BENEFICIARIES OF PROJECT:**

Construction of a temporary experimental desalination prototype plant for information gathering purposes to determine feasibility of different reverse osmosis plant components for domestic water supply. The site will be secured by fencing, about 30' by 60' and contain various testing equipment and tanks. It will also contain a small trailered portable office/interpretive building. Temporary screened intake supply and discharge pipelines will be installed on the existing pier owned by Marin Rod & Gun Club. Beneficiaries are the people of Marin Municipal Water District.

**NAME OF PUBLIC AGENCY APPROVING PROJECT:** Marin Municipal Water District**NAME OF PERSON OR AGENCY CARRYING OUT PROJECT:**

Marin Municipal Water District - Bob Castle

**EXEMPT STATUS FINDING:** MMWD finds that this project is exempt from CEQA for the following reasons:

Categorical Exemption. CEQA Guidelines Sec. 15306, Information Collection and Section 15303(c), New Construction or Conversion of Small Structures

**REASONS WHY PROJECT IS EXEMPT:** The pilot desalination plant is an experimental testing activity involving small structures that does not result in a serious or major disturbance to an environmental resource. The facility will be located in a paved parking lot. Associated piping will be located on the edge of a parking lot and on an existing pier. All structures are temporary and resting on an existing parking lot, and do not exceed 2500 sq. ft. No potential significant environmental impacts have been identified.

**CONTACT PERSON**

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**AREA CODE & TELEPHONE**

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Oct 7, 2004  
 Date

Paul Heeliker  
 Paul E. Heeliker,  
 General Manager