

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
COLORADO RIVER BASIN REGION**

ORDER NO. 01-187

WASTE DISCHARGE REQUIREMENTS  
FOR  
TWENTYNINE PALMS WATER DISTRICT, OWNER/OPERATOR  
FLUORIDE REMOVAL WATER TREATMENT PLANT  
Twentynine Palms – San Bernardino County

The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:

1. Twentynine Palms Water District (hereinafter referred to as the discharger), owns and proposes to operate a fluoride removal water treatment plant (FRTP) located at 74400 Amboy Road in the city of Twentynine Palms, CA 92277. The plant is to be operated for the removal of excess fluoride from well water and the treatment of process wastewater for irrigating adjacent fields on which native halophyte (salt-loving) plants will be grown.
2. The discharger submitted a Report of Waste Discharge application, dated May 2, 2001, along with supporting documents describing the detailed treatment processes of the FRTP, a biological assessment of the plants that will be grown, and a quality comparison of the source water, proposed discharge, and the receiving water.
3. The discharger owns a 160-acre parcel of vacant land southwest of the intersection of Amboy Road and Utah Trail, parcel number 62123101. The site is located on the NE  $\frac{1}{4}$ , Section 21, T1N, R9E, SBB&M.
4. The discharger is the sole provider of water to approximately 6,100 service connections in the high desert area, consisting of 88 square miles. It has been stated by the discharger that the high quality groundwater subbasins drawn from in the past are currently over drafted and the Mesquite Springs aquifer, which is proposed to be developed, is estimated to contain one million acre feet of water. The Mesquite Springs aquifer contains high quality water with the exception of concentrations of fluoride (typical range from 5 to 8 milligrams per liter [mg/l]).
5. The treatment process is designed to treat 3 million gallons of raw water per day (3 MGD) for delivery to an existing distribution system.
6. The treatment process is designed to reduce the fluoride in the raw water to a regulated level of 1.6 mg/L by using granular activated alumina with pH adjustment. Fluoride removal treatment takes place in three separate parallel treatment modules, each module consisting of two treatment vessels. Once a vessel becomes saturated, and there is no more fluoride being removed from the raw water, this vessel is isolated and taken off-line to be regenerated. It is during the regeneration process that the fluoride wastewater stream flows into one of two reservoirs; the low fluoride wastewater reservoir (LFR) or the high fluoride wastewater reservoir (HFR). In the HFR, suspended solids are allowed to settle and the sludge is pumped to a filter press where it is dewatered. The dewatered solids are disposed of in a landfill. The filtrate is recycled to the HFR until the liquid is clear, and then directed to the LFR where all of the wastewaters are mixed by means of mechanical mixers. The proposed use of the wastewater is for irrigation of native species of halophytes located at the site.

7. Halophytes, which have extensive root systems making them drought tolerant, occur naturally in saline habitats and desert environments. The genus *Atriplex* (Family *Chenopodiaceae*), saltbush, exists worldwide in saline shoreline and inland habitats. Several species of the genus *Atriplex* are native to the Twentynine Palms area and were the foliage that was removed during grading and construction of the treatment plant. These plants will take up salt through their root system and sequester the salt in their leaves. The aboveground plant matter can be up to 25 percent salt by mass on a dry weight basis. The root zone extends to 15 or 20 feet below ground surface in order to provide enough water to sustain growth.
8. The consumptive use of water for the *Atriplex* species ranges from 0.583 to 1.75 cm/day. The consumptive use increases as a function of potential evapotranspiration and with water availability. This project is proposed to be managed such that the irrigation is slightly less than the crop water demand to ensure that all of the water is utilized within the root zone of the plants.
9. The halophytes are proposed to be grown adjacent to the treatment plant. Calculations show that approximately 15 acres will be required for the 100,000 gallons-per-day (gpd) of reject water proposed for the initial operations. The field will consist of two equal zones and will be built so that it can be expanded, if necessary, through the addition of zones to handle an eventual flow rate of 200,000 gpd in winter. The discharger will extend the existing fence to encompass the irrigated plots.
10. The discharger submitted a "Project Manual for the Fluoride Removal Water Treatment Plant and Booster Station", dated February 2, 1999. According to this report, Southland Geotechnical determined that the groundwater at the site ranges from 39 to 47 feet.
11. The soil at the site is naturally saline and consists of inter-bedded sands, silty sands and silts, with layers of clay generally occurring below 25 feet.
12. The source water for the FRTP is an extraction well located 1500 feet south-southwest of the treatment plant. The total dissolved solids (TDS) concentration in the source water is approximately 326 mg/L and the pH is 8.18 on the average.
13. The wastewater will have elevated salt relative to source water. The estimated TDS concentration of the wastewater is 1800 mg/L based on a stoichiometric analysis of the source water and the chemical additives. The fluoride removal by adsorption onto activated alumina requires adjustment of pH, which is accomplished by the addition of sulfuric acid and sodium hydroxide. The wastewater will contain elevated concentrations of sodium, sulfate, and TDS, relative to the source water.
14. The discharger proposes to develop crop coefficients for plants at the site following the first year, using neutron probe measurements before and after irrigations to obtain drying and wetting curves under irrigation. Moisture profiles from neutron probe measurements will be developed for approximately 20 locations under irrigation and for four control plots outside of the area where *Atriplex* will be grown.
15. The instrument proposed for soil moisture measurements is the CPN 503-DR hydroprobe moisture gauge manufactured by the Boart Longyear Company.
16. The wastewater is from an industrial treatment process and will contain no organic chemicals, viruses, bacterial agents, pharmaceutical chemicals, or other constituents associated with municipal wastewater.

17. The following chemicals are used during the treatment process;

Chemical Name

purpose, and flowrate in gallons per hour (gph)

Sulfuric Acid

pretreatment lowering of feed water pH for fluoride removal process, flowrate 0-7 gph

pretreatment lowering of feed water pH for neutralization of regenerated treatment media bed, flowrate 0-10 gph

post-treatment lowering of regeneration wastewater pH for neutralization, flowrate 0-37 gph

Sodium Hydroxide

pretreatment raising of feed water pH for regeneration of treated media, flowrate 2-5 gph

post treatment raising of treated water pH, flowrate 0-4 gph

Calcium Chloride

post treatment addition of calcium ions for high fluoride regeneration wastewater

precipitation of calcium fluoride, flowrate 0-158 gph

18. The Water Quality Control Plan for the Colorado River Basin Region of California (Basin Plan), adopted on November 17, 1993, designates the beneficial uses of ground and surface waters in this Region. The designated beneficial uses of ground water in the Dale Hydrologic Unit are:

- a. Municipal Supply (MUN)
- b. Industrial Supply (IND)
- c. Agricultural Supply (AGR)

19. In accordance with the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.), Twentynine Palms Water District, acting as lead agency, adopted a Mitigated Negative Declaration (MND) for the District's "Water Facilities Master Plan Report." One of the facilities identified in the Master Plan was a water treatment plant to reduce fluoride concentrations in well water. The District approved the water treatment plant after adopting a Negative Declaration on July 22, 1998. On August 22, 2001, the District approved an Addendum to the Twentynine Palms Water District Master Plan Negative Declaration for the Potable Water Treatment Plant, SCH # 92042103. The Regional Board has considered the 1992 MND, the Regional Board has the 1998 Negative Declaration, and the Addendum.

20. The Board has notified the discharger and all known interested agencies and persons of its intent to issue Waste Discharge Requirements for said discharge, and has provided them with an opportunity for a public meeting and an opportunity to submit comments.

21. The Board, in a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED, that in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, the discharger shall comply with the following:

A. Effluent Limitations

- 1. The pH of the effluent shall be maintained between 6.0 to 9.0.

2. Discharged wastewater that contains a total dissolved solids (TDS) content in excess of the source water shall not be allowed to percolate to the groundwater.
3. The 30-day average of discharged wastewater shall not exceed 100,000 gpd.
4. The effluent discharged onto land owned and maintained by the TPWD shall not contain constituents in excess of the following limits:

| <u>Constituent</u>     | <u>Unit</u>       | <u>30-Day<br/>Arithmetic Mean<br/>Discharge Rate<sup>1</sup></u> | <u>7-Day<br/>Arithmetic Mean<br/>Discharge Rate<sup>2</sup></u> |
|------------------------|-------------------|--|---|
| Total Dissolved Solids | mg/L <sup>3</sup> | 2000   | 2500  |
| Fluoride               | mg/L              | 18   | 21  |
| Sodium                 | mg/L              | 800  | 880   |
| Sulfate                | mg/L              | 700  | 770   |

**B. Specifications**

1. No changes in type or amount of treatment chemicals added to the process water as described in Finding No. 17 of this Board Order shall be made without the written approval of the Regional Board's Executive Officer.
2. The treatment or disposal of wastes at this facility shall not cause pollution or nuisance as defined in Sections 13050 of Division 7 of the California Water Code.
3. A minimum depth of freeboard of two (2) feet shall be maintained at all times in the low and high fluoride wastewater reservoirs.
4. The FRTP shall be protected from any washout or erosion of waste or covering material and from any inundation which could not occur as a result of floods having a predicted frequency of once in 100 years.
5. Moisture determinations shall be performed on the 15 acres where neutron probes are installed in accordance with the following:
  - a. Neutron probes shall be kept calibrated and maintained according to manufacturer's recommendations.
  - b. All of the neutron probes installed at the site shall be read within a single 7-day period.
  - c. All operators of the neutron probes shall be licensed by the state.
  - d. All permits that are required for storage, transportation and operation of the neutron probes shall be obtained.
6. Moisture detected at 15 feet below ground surface shall trigger a series of sampling tests, using the approved testing devices, to determine the concentrations of TDS, pH, fluoride, sodium and sulfate.
7. There shall be no surface flow of wastewater away from the discharge facility.

<sup>1</sup> 30-Day Mean – The arithmetic mean of pollutant values of samples collected in a period of 30 consecutive days.

<sup>2</sup> 7-Day Mean – The arithmetic mean of pollutant values of samples collected in a period of 7 consecutive days.

<sup>3</sup> mg/L – milligrams per liter

8. Wastes, including windblown spray, shall be strictly confined to the lands specifically designated for the disposal operation, and irrigation practices shall be managed so that runoff of effluent from irrigated areas does not occur at any time.
9. All discharge locations shall be protected from any washout or erosion and from any inundation which could occur as a result of floods having a predicted frequency of once in 100 years.
10. Solids and settled material shall be disposed of in a manner that will not result in pollution or nuisance as defined by the California Water Code.

#### C. Prohibitions

1. The direct discharge of any wastewater to any surface water or surface drainage courses is prohibited.
2. Bypass or overflow of untreated or partially treated waste is prohibited.
3. The discharge of waste to land not owned or controlled by the discharger is prohibited.
4. The discharge of wastewater to a location or in a manner different from that described in Finding Nos. 1,6,8,9, and 14 above is prohibited.
5. The discharge of wastewater containing any carcinogen or reproductive toxins listed by the Governor pursuant to Health and Safety Code Sections 25249.5 through 25249.13, also known as the Safe Drinking Water and Toxic enforcement Act of 1986 (Proposition 65), where such chemical passes or probably will pass into any source of drinking water, is prohibited.
6. The disposal of wastes in excess of the design treatment capacity of the system is prohibited.
7. The discharge or deposit of hazardous waste (as defined in Title 27 of the California Code of Regulations), and other wastes that pose a potential threat to water quality at this facility is prohibited.
8. The discharge of hazardous or designated wastes to other than a waste management unit authorized to receive such waste is prohibited.
9. Permanent (longer than one year) disposal or storage of hazardous waste in on-site temporary containment basins is prohibited.

#### D. Provisions

1. The discharger shall comply with "Monitoring and Reporting Program No. 01-187" and future revisions thereto, as specified by the Regional Board's Executive Officer.
2. Prior to any change in ownership or management of this operation, the discharger shall transmit a copy of this Board Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Regional Board.

3. Prior to any modifications in this facility, which would result in material change in the quality or quantity of discharge, or any material change in the location of the discharge, the discharger shall report all pertinent information in writing to the Regional Board and obtain revised requirements before any modifications are implemented.
4. The discharger shall ensure that all site-operating personnel are familiar with the content of this Board Order, and shall maintain a copy of this Board Order at the site.
5. This Board Order does not authorize violation of any federal, state, or local laws or regulations.
6. The Regional Board will review this Board Order periodically and may revise requirements when necessary.
7. The discharger shall allow the Regional Board, or an authorized representative, upon presentation of credentials and other documents as may be required by law, to:
  - a. Enter upon the premises regulated by this Board Order; or the place where records must be kept under this Board Order;
  - b. Sample or monitor at reasonable times, for the purpose of assuring compliance with this Board Order or as otherwise authorized by the California Water Code, any substances or parameters at this location.
8. The discharger shall comply with all of the conditions of this Board Order. Any noncompliance with this Board Order constitutes a violation of the Porter-Cologne Water Quality Control Act and is grounds for enforcement action.
9. This Board Order does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
10. Unless otherwise approved by the Regional Board's Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", promulgated by the United States Environmental Protection Agency.
11. The results of any analysis of samples taken more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Regional Board.
12. The discharger shall provide an inventory of all hazardous materials that will be handled at the facility by May 15, 2002.
13. The discharger is the responsible party for the Waste Discharge Requirements, and the Monitoring and Reporting Program for the facility. The discharger shall comply with all conditions of these Waste Discharge Requirements. Violations may result in enforcement actions, including Regional Board Orders or court orders, requiring corrective action or imposing civil monetary liability or in modification or revocation of these Waste Discharge Requirements by the Regional Board.

14. The discharger shall retain records of all monitoring information including all calibration and maintenance records, copies of all reports required by this Board Order, and records of all data used to complete the application for this Board Order. Records shall be maintained for a minimum of three (3) years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board's Executive Officer.
15. Records of monitoring information shall include:
  - a. The date, exact place, and time of sampling and measurements.
  - b. The individual(s) who performed the sampling or measurements.
  - c. The date(s) analyses were performed.
  - d. The individual(s) who performed the analysis.
  - e. The analytical techniques or methods used.
  - f. The result of such analysis.
16. The discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances), that are installed or used by the discharger to achieve compliance with conditions of this Board Order.
17. The discharger shall furnish, under penalty of perjury, technical monitoring program reports, and such reports shall be submitted in accordance with the specifications prepared by the Regional Board's Executive Officer. Such specifications are subject to periodic revisions as may be warranted.
18. The discharger shall report any noncompliance that is likely to endanger human health or the environment, within 24 hours of becoming aware of its occurrence. The incident shall be reported to the Regional Board Office and to the Office of Emergency Services. During non-business hours, the discharger shall leave a message on the Regional Board's voice mail. The Office of Emergency Services is operational 24 hours a day. A written report shall be submitted to this office, within five (5) business days of the discharger becoming aware of the incident. The report shall contain a description of the noncompliance, its causes, the duration, and the actual or anticipated time for achieving compliance. The report shall include complete details of the steps that the discharger has taken or intends to take, in order to prevent recurrences. All intentional or accidental spills exceeding 1,000 gallons shall be reported as required by this provision.

I, Philip A. Gruenberg, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on November 14, 2001.

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Executive Officer