

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

**ORDER NO. R2-2013-xxxx**

**WATER RECYCLING REQUIREMENTS FOR:**

**RUSSELL CITY ENERGY COMPANY LLC, AND  
RUSSELL CITY ENERGY CENTER RECYCLED WATER FACILITY,  
HAYWARD, ALAMEDA COUNTY**

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

1. Discharger and Facility

The Russell City Energy Company LLC owns and operates the Russell City Energy Center, an electrical generation power plant project located at 3862 Depot Road in Hayward, Alameda County. The Russell City Energy Center will produce disinfected tertiary recycled water at the Russell City Energy Center Recycled Water Facility (Recycled Water Facility) and use the water at the Russell City Energy Center.

The Discharger is Russell City Energy Company LLC, a project-specific limited liability corporation that is 75 percent owned indirectly by Calpine Corporation and 25 percent owned by Aircraft Services Corporation, which is an indirect subsidiary of General Electric Capital Corporation.

The Facility, as referred to herein, consists of the Recycled Water Facility, the Russell City Energy Center, and all water distribution and use areas. The Facility property is 18.8 acres in total area and consists of four adjacent tax parcels, either owned or leased by the Discharger. The Discharger is responsible for the entire Facility property.

2. Reason for Action

The Discharger has proposed to construct and operate the Recycled Water Facility to produce disinfected tertiary recycled water and to use this water for power plant cooling tower water and for drip irrigation of landscape plants. The recycled water production, distribution and use will be at the Facility under the Discharger's control.

This production and use of recycled water is subject to regulation under water reclamation (recycling) requirements prescribed by the Water Board in accordance with Water Code section 13523.

The production and use of recycled water are anticipated to begin in 2013.

3. History

This is a new facility. The Water Board has not previously considered or permitted this facility.

4. Report of Waste Discharge

Calpine Corporation, on behalf of the Discharger, filed a Report of Waste Discharge for this recycled water project on January 17, 2012, and additional information on July 20, 2012. The complete Report of Waste Discharge includes

- a. The Discharger's letter to the Water Board dated January 12, 2012;
- b. The Discharger's completed application form, State Form 200, signature-dated January 12, 2012;
- c. The Discharger's engineering report dated November 11, 2011 (Engineering Report);
- d. The California Energy Commission decision authorizing the power plant project dated October 2007, CEC-800-2007-003-CMF (01-AFC-7C); and
- e. The California Department of Public Health (CDPH) letter to the Water Board dated July 20, 2012, commenting on and approving the Engineering Report.

5. Facility and Discharge Location

The Facility is located at 3862 Depot Road, Hayward, Alameda County, California. All discharges subject to this Order occur at the Facility. The Facility property is located south of Depot Road and north and northwest of the adjacent Hayward Water Pollution Control Facility property. The area is zoned for industrial use. Adjacent land uses are industrial and commercial. A location map is Attachment 1 of this Order.

**Regulation of Recycled Water**

6. California Code of Regulations Title 22 Water Recycling Criteria, California Department of Public Health, and Water Board

Criteria for recycled water production and use have been established and codified as California Code of Regulations, title 22, sections 60301 et seq. (Title 22 Water Recycling Criteria). The current Title 22 Water Recycling Criteria were adopted on December 2, 2000, and became effective March 20, 2001. The Title 22 Water Recycling Criteria are implemented through engineering report review and approval by CDPH and through water recycling requirements by the Water Board.

This Order implements applicable Title 22 Water Recycling Criteria.

7. Water Recycling Requirements

The Water Board has the authority and responsibility to prescribe water recycling requirements for water that is used as recycled water, after consultation with and receipt of recommendations from CDPH, pursuant to Water Code section 13523. These water recycling requirements comply with Water Code section 13523 and the current Title 22 Water Recycling Criteria. The Water Board has consulted with CDPH and received written comments. This Order includes requirements that address and implement all CDPH comments and recommendations.

For purposes of this Order, "recycled water" as defined in Water Code section 13050 and "reclaimed water" as used in Water Code section 13523 are synonymous and refer to treated wastewater suitable for reuse. Similarly, the terms "recycling" and "reclamation" are used interchangeably to refer to production, distribution and use of recycled water.

8. Engineering Report

An engineering report is required to be prepared and submitted to CDPH for review, comment and approval for any proposed production or use of recycled water. (Cal. Code Regs., title 22, § 60323.)

The Discharger submitted the Engineering Report to CDPH as required. CDPH found the report acceptable and provided written comments to the Water Board by letter dated July 20, 2012. The Engineering Report and CDPH comment letter are part of the complete Report of Waste Discharge for the project.

**Recycled Water**

9. Recycled Water Uses

The recycled water uses are industrial cooling in a cooling tower at the Russell City Energy Center power plant, and irrigation of landscape plants by drip irrigation within the Facility property. These uses require recycled water that meets the quality standards for disinfected tertiary recycled water established in Title 22 Water Recycling Criteria sections 60301.230 and 60301.320, and associated criteria for use of disinfected tertiary recycled water established in Title 22 Water Recycling Criteria section 60310.

10. Recycled Water Quality - Disinfected Tertiary Recycled Water

The Discharger will produce and use disinfected tertiary recycled water as defined in Title 22 Water Recycling Criteria section 60301.230. The Recycled Water Facility source water is disinfected secondary treated effluent from the City of Hayward Water Pollution Control Facility. The Recycled Water Facility treatment process includes oxidation, clarification, filtration and disinfection. The treatment process complies with the criteria for disinfected tertiary recycled water given in Title 22 Water Recycling Criteria sections 60301.230 and 60301.320.

11. Recycled Water Quality - Design Water Quality Characteristics

The design quality of the recycled water is presented in Tables 1 and 2.

Table 1 - Recycled Water Quality - Title 22 Water Recycling Criteria Requirements

Parameter	Measure	Design Quality	
Turbidity	Average	2	NTU, average over a 24 hour period
Turbidity	Maximum	5	NTU, no more than 72 minutes in 24 hours
Turbidity	Maximum	10	NTU, at any time
Disinfection CT	Minimum	450	mg-min/L
Modal Contact Time	Minimum	90	minutes
Total Coliform	Median-7	2.2	MPN/100 ml, or less
Total Coliform	Maximum	23	MPN/100 ml, one sample in 30 days
Total Coliform	Maximum	240	MPN/100 ml, any sample

Table 2 - Recycled Water Quality - Conventional Water Quality Parameters

Parameter	Measure	Design Quality
Dissolved Oxygen	Minimum	1.0 mg/L
Biochemical Oxygen Demand	Maximum	10 mg/L
Total Suspended Solids	Maximum	10 mg/L
Total Dissolved Solid	Maximum	700 mg/L
Total Nitrogen	Average	30 mg/L

Abbreviations for Tables 1 and 2:

NTU	Nephelometric Turbidity Units
CT	A parameter whose value is the mathematical product of total chlorine residual concentration in mg/L and modal contact time in minutes
mg-min/L	Milligram-minutes per Liter, the units for CT values
mg/L	Milligrams per Liter
MPN/100 ml	Most Probable Number per 100 milliliters
Median-7	Median value of test results from 7 consecutive most recent samples

12. Recycled Water Use Quantity

The planned recycled water use at the Facility is an average daily flow of 1.56 million gallons per day (mgd) and a total of 569.4 million gallons per year. Of this, the quantity planned for landscape irrigation is 1,090 gallons per day as an average daily flow, or 397,850 gallons per year, or 0.07 percent of projected total annual flow.

The Recycled Water Facility peak flow has a design peak production rate of 3,500 gallons per minute (equivalent to 5.04 mgd). The maximum daily water demand is approximately 2,413 gallons per minute (equivalent to 3.47 mgd). The Recycled Water Facility provides a capacity margin of about 45 percent relative to projected peak demand.

13. Recycled Water Use Areas

The recycled water use areas are the Russell City Energy Center power plant cooling water system and the Facility landscape irrigation system and areas irrigated with recycled water.

14. Recycled Water Producer, Distributor and User

The Discharger is the producer, distributor and user of recycled water for this project.

**Recycled Water Treatment Process and Compliance with Applicable Criteria**

15. Recycled Water Facility Treatment Process

The Recycled Water Facility treats disinfected secondary treated effluent from the Hayward Water Pollution Control Facility to produce disinfected tertiary recycled water. The Recycled Water Facility treatment process includes clarification by means of a Parkson Lamina Gravity Separator system, filtration by a Parkson-Dynasand Filtration system, and disinfection by chlorination and chlorine contact chambers.

a. Influent and Parallel Treatment Trains

Recycled Water Facility influent is disinfected secondary treated effluent from the

Hayward Water Pollution Control Facility with an average turbidity of 17 NTU. This influent water is pumped by three pumps from a wet well to the Recycled Water Facility where the flow is divided into two parallel treatment trains for tertiary treatment. Each train includes one Parkson Lamella Gravity Separator followed by one Parkson-Dynasand Filtration and Disinfection system. The design flow capacity is 2.52 mgd for each train.

b. Clarification

The Lamella Gravity Separator treatment system provides required coagulation, flocculation, and clarification utilizing incline plates to settle solids. Sodium hypochlorite and ferric chloride (coagulants) are added and mixed by a variable speed mixer to form floc. The recycled water enters the clarifier and flows downward through the inlet chamber in the center of the unit and enters the plates through the side-entry plate slots. As the liquid flows upward, the solids settle on the inclined, parallel plates and slide into the sludge hopper at the bottom. The clarified effluent water leaves the plate assembly through the weirs at the top. Effluent turbidity is expected to be less than 5 NTU prior to filtration treatment.

c. Filtration

The effluent from the Clarifier flows into the Parkson-Dynasand Filtration system for its respective treatment train. The proprietary Parkson-Dynasand Filtration system utilizes a continuous backwash process. Each filtration module at this facility has four filter cells. The influent enters each module and is distributed among the four filter cells with the flow entering each filter cell from the bottom and flowing upward through the sand bed and exiting at the top of the cell. The sand in these filter cells is continuously turned over as sand from the bottom of the bed is washed with compressed air and re-deposited back on top of the bed.

The Parkson-Dynasand Filtration system is an acceptable filtration treatment technology for meeting the filtration performance criteria required for tertiary treated recycled water in accordance with the CDPH's *Treatment Technology Report for Recycled Water*, dated December 2009. The design filtration rate is 4.225 gallons per minute per square foot. The filters are designed to produce filtered water turbidities of less than 2 NTU. The design filtration rate and the expected finished water turbidities comply with the criteria for filtered wastewater given in Title 22 Water Recycling Criteria section 60301.320.

d. Disinfection

Disinfection is provided by chlorination and contact time. Following filtration, effluent from the two filtration trains is combined and this filtered water then flows to the disinfectant mixing units. The filtered water is mixed with sodium hypochlorite disinfectant in two mixers installed in series upstream of the contact basins. After mixing, the flow is again divided and then distributed to one of two chlorine contact basins.

The two chlorine contact basins are essentially identical but independent units, constructed side by side, but hydraulically separate and operated in parallel. Each basin has a serpentine flow path with extensive baffling in order to approach plug flow conditions. Each basin provides 90 minutes modal chlorine contact time and minimum design CT value of 450 mg-min/L. The disinfection process complies with the criteria for disinfection of tertiary

recycled water given in Title 22 Water Recycling Criteria section 60301.230. Upstream of the chlorine contact basins, two mixers installed in series mix the disinfectant, sodium hypochlorite, with filtered water.

16. Cooling Tower Design Requirements

The cooling tower will have high efficiency drift eliminators designed to limit drift to 0.0005 percent of the circulations water flow. Chlorine dioxide will be the primary biocide to minimize the growth of Legionella and other microorganisms in the cooling system recirculation water. This complies with the criteria for cooling tower design given in Title 22 Water Recycling Criteria section 60306(c).

17. Sampling and Analysis Requirements for Turbidity, CT and Total Coliform

An on-line turbidimeter and analyzer will continuously measure and record the combined filtered effluent. A composite sampler will take samples of the recycled water after disinfection to monitor and record CT continuously and collect Total Coliform samples daily. This complies with the criteria for Sampling and Analysis for disinfected tertiary recycled water given in Title 22 Water Recycling Criteria section 60321.

18. Operators and Employee Training

The Recycled Water Facility will be operated and maintained by state-certified Wastewater Treatment Operators (Operators) of appropriate grade. The Discharger will use three Operators on a full-time basis to operate the Recycled Water Facility. At present, this crew of Operators includes one each of certification Grade 3, 2 and 1. The Grade 3 Operator is working toward Grade 4 certification.

The Grade 3 Operator is also being trained to be the Russell City Energy Center Use Area Supervisor. This Operator will be trained to meet the certification requirements established by the American Water Works Association (AWWA) *Guidelines for On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water* and the AWWA *Guidelines for Distribution of Non-potable Water*. This Operator will also be trained on cross-connection testing procedures recommended by AWWA.

After completing the training, the Russell City Energy Center Use Area Supervisor will train the other two Operators before they begin work in the recycled water use area. This arrangement complies with the criteria for personnel given in Title 22 Water Recycling Criteria section 60325.

19. Use Area Buffer Zone Requirements for Domestic Wells

There are two known wells within 1000 feet of the Facility site. An existing well south of the Facility's north fence line will be abandoned and filled in accordance with a Well Abandonment Permit from the Alameda County Environmental Health Department prior to recycled water use. An existing monitoring well located about 250 feet north of the Facility's north fence line will be relocated at least 500 feet from the closest recycled water use area. These measures will comply with the criteria for a minimum setback distance of fifty feet between domestic wells and recycled water use areas given in Title 22 Water Recycling Criteria section 60310(a).

**20. Supplemental Water Supply, Potable Water Supply and Cross-Connection Control**

In the event that secondary effluent is not available from the City of Hayward Water Pollution Control Facility or if the quality of that effluent cannot be treated to Title 22 Water Recycling Criteria disinfected tertiary recycled water quality standards, or if there is insufficient recycled water to meet demand, the City of Hayward water supply system can supply potable water to supplement or replace the recycled water. The potable water will be fed to the cooling tower basin through a potable water supply line that is separate from the recycled water supply line and is protected by an air-gap separation. This complies with potable water protection requirements. (See Cal. Code Regs., title 17, § 7603(a).)

A separate potable water distribution system will supply drinking water from the City of Hayward water system for other potable uses at the Facility. A reverse-pressure-principle (RPP) device is provided on the City of Hayward water supply line that enters the Facility on Depot Road to protect the City of Hayward water supply from potential cross-connections and backflow from the Facility. There are no cross-connections between the potable water system and the recycled water system within the Facility.

**21. Water Main Separation and Recycled Water Pipeline Construction Requirements**

All water mains that supply the Facility comply with the following separation criteria: 10 feet horizontal and 1 foot vertical separations between water mains and sanitary sewer pipelines, and 4 feet horizontal and 1 foot vertical separations between water mains and disinfected tertiary recycled water pipelines. This satisfies the requirements for separation of water mains and non-potable pipelines given in California Code of Regulations Title 22 section 64572. (Cal. Code Regs., title 22, § 64572.) All recycled water mains are constructed with CDPH-approved materials, colored purple, and labeled as Recycled Water- Do Not Drink, to comply with Health and Safety Code section 116815. (Health & Saf. Code § 116815.)

**22. Reliability Features**

The Recycled Water Facility has the following reliability features: emergency storage of 750,000 gallons which can provide 5 to 15 hours of storage capacity; multiple treatment units; and standby units for treatment, chemical feed, and alarms. The Recycled Water Facility is designed to provide two-times-50 percent redundancy for each unit process such that the Facility can operate with one unit for each process. These reliability features comply with the criteria for full treatment reliability given in Title 22 Water Recycling Criteria sections 60341 through 60355.

The Recycled Water Facility will be operated as part of the overall Russell City Energy Center complex, providing operations supervision 24 hours a day, all days. Should an alarm from the Recycled Water Facility be activated, operators on duty will respond to the alarm. This complies with the criteria for personnel given in Title 22 Water Recycling Criteria section 60325.

Cross-connection control procedures include installation of devices at use areas and cross-connection test procedures for start-up of use areas. These comply with the requirements for a cross-connection program to protect public water systems against cross-connection hazards. (Cal. Code Regs., title 17, §§ 7583 - 7605.)

**23. California Department of Public Health Recommendations**

The Discharger's November 2011 Engineering Report for the Russell City Energy Center Recycled Water Facility and follow-up supporting documentation submitted to CDPH by the Discharger adequately addresses all CDPH requirements for the proposed production and use of recycled water. CDPH recommended, in its letter of July 20, 2012, that the Water Board:

- a. Approve the use of the Russell City Energy Center Recycled Water Facility's recycled water for the Russell City Energy Center's cooling tower and for minor landscape irrigation at the Facility, and
- b. Issue a water recycling requirements permit to the Discharger to operate the Russell City Energy Center Recycled Water Facility.

**California Environmental Quality Act**

**24. California Environmental Quality Act**

The California Energy Commission (CEC) is the lead agency under the California Environmental Quality Act (CEQA) for the Russell City Energy Center project.

The CEC's power plant certification process is a certified regulatory program under the California Environmental Quality Act ("CEQA") (Cal. Code Regs., title 14, §§ 15250, 15251(k); see also California Energy Commission, Final Commission Decision, Russell City Energy Center, Amendment No. 1 (01-AFC-7C), October 2007, p. 3). The CEC serves as the lead agency under CEQA. (Pub. Res. Code § 25519(c).) The written documents of the CEC's siting process are collectively the functional equivalent of a CEQA environmental impact report ("EIR") and must comply with the substantive provisions of CEQA and the CEQA Guidelines. (Pub. Res. Code § 21080.5.)

The CEC examines whether the proposed project will comply with all laws, ordinances, regulations, and standards, and whether the proposed project will cause any significant, inmitigable, adverse environmental impacts. (Pub. Res. Code §§ 25519, 25523; Cal. Code Regs., title 14, §§ 15250, 15252.) The CEC may not approve a project that does not comply with applicable laws, ordinances, regulations, and standards, or that has a significant, inmitigable, adverse environmental impact, unless the CEC also determines that the proposed project has overriding benefits. (Pub. Res. Code §§ 21081, 25525.)

Any other public agency that must make a decision that is subject to CEQA for a site or related facility certified by the CEC must use the document prepared by the CEC in the same manner as they would use an EIR prepared by a lead agency. (Pub. Res. Code § 25519(c).) The Water Board acting as a CEQA Responsible Agency pursuant to California Code of Regulations, title 14, section 15096, subdivision (g)(2), evaluated the potential impacts to water quality addressed in the environmental documents and finds the recycled water project will not have a significant adverse impact on water quality of surface waters or groundwaters.



## **Water Board Plans and Policies**

### **25. Basin Plan**

The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes implementation plans to achieve water quality objectives. The Basin Plan was duly adopted by the Regional Water Board and approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law and U.S. Environmental Protection Agency. This Order implements the Basin Plan.

### **26. Receiving Waters**

The majority of the recycled water used in this project is for power plant cooling water. After use, the water either evaporates to the atmosphere or is condensed for capture and reuse. A small amount of the recycled water is used for drip irrigation of onsite landscape plants. After discharge to land, this water may evaporate to the atmosphere, transpire through plants to the atmosphere, remain captured in plants or soil, or percolate through the soil to groundwater. The irrigation discharges are intended to match the irrigation demand of the vegetation and thus minimize discharges to groundwater.

The receiving water is the groundwater beneath the Facility. The groundwater basin in this area is identified in the Basin Plan as the Santa Clara Valley groundwater basin, East Bay Plain sub-basin, basin ID number 2-9.04.

### **27. Beneficial Uses**

The beneficial uses of the groundwater of the Santa Clara Valley basin, East Bay Plain sub-basin as set forth and defined in the Basin Plan are:

- a. Municipal and domestic water supply;
- b. Industrial Process Water Supply;
- c. Industrial Service Water Supply; and
- d. Agricultural Water Supply.

### **28. Notification of Interested Parties**

The Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe water recycling requirements for the recycled water project, and has provided them with an opportunity for a public hearing and an opportunity to submit written comments and recommendations.

### **29. Hearing and Consideration of Comments**

The Water Board, in a properly noticed public meeting, heard and considered all comments pertaining to the recycled water project.

### **30. State Water Board Recycled Water Policy**

State Water Board Resolution No. 2009-0011, "Adoption of a Policy for Water Quality Control for Recycled Water," references and adopts the "State Water Resources Control Board Recycled Water Policy" (Recycled Water Policy). The Recycled Water Policy provides

direction to the State and Regional Water Boards regarding the appropriate criteria to be used in issuing permits for some recycled water projects. The Recycled Water Policy describes permitting criteria intended to streamline, and provide consistency for, the permitting of the vast majority of recycled water projects.

This Order implements the Recycled Water Policy through CDPH review of the project's Engineering Report and written comments and recommendation to the Water Board consistent with section 5.b. of the Recycled Water Policy, and through Water Board issuance of water recycling requirements consistent with section 5.c. of the Recycled Water Policy.

**IT IS HEREBY ORDERED** pursuant to Water Code sections 13523, 13263 and 13267 that the Discharger shall comply with the following:

**A. Prohibitions**

1. The production, distribution or use of recycled water other than as described in the Report of Waste Discharge for this project or described in this Order is prohibited.
2. The discharge of inadequately treated water from the Facility to waters of the State is prohibited.
3. The production, storage, distribution, or use of recycled water shall not create a nuisance or pollution as defined in Water Code section 13050.
4. The use of recycled water as a domestic water supply is prohibited.

**B. Recycled Water Quality Specifications**

1. The Discharger shall assure that the recycled water distributed for use is adequately oxidized, disinfected tertiary treated water that meets the following quality limits:

- a. The final treated recycled water must not exceed the following limits:

<u>Constituent</u>	<u>Unit</u>	<u>Daily Maximum</u>
1) BOD <sub>5</sub>	mg/L	10.0
2) TSS	mg/L	10.0
3) Total Nitrogen	mg/L as N	30.0

- b. Turbidity. The recycled water turbidity must not exceed

- 1) An average of 2.0 NTU within any 24 hour period,
- 2) 5.0 NTU more than 5 percent of the time within a 24-hour period, and
- 3) 10.0 NTU at any time.

- c. Disinfection.

The chlorine disinfection process following filtration must provide a CT value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at

least 90 minutes based on peak dry weather flow design flow. The CT value is the mathematical product of total chlorine residual concentration in mg/L and modal contact time in minutes.

d. Total Coliform Bacteria.

The recycled water shall meet the following limits of bacteriological quality, using the results of daily sampling and analyses for total coliform:

The numeration of total coliform bacteria in terms of Most Probable Number per 100 milliliters (MPN/100 ml) shall not exceed

- 1) 2.2 MPN/100 ml in the median value using the results of the last seven days for which analyses have been completed; and
  - 2) 23 MPN/100 ml in more than one sample in any 30 day period; and
  - 3) 240 MPN/100 ml in any one sample.
2. The Discharger shall discontinue the distribution and use of recycled water during any period when there is reason to believe that compliance with the limits specified in B.1. above is not achieved. The distribution and use of recycled water shall not resume until all conditions that caused the noncompliance or suspected noncompliance have been appropriately investigated and corrected.
  3. The Discharger shall provide documentation, acceptable to the Executive Officer, that the Recycled Water Facility is operated and maintained by qualified and adequately trained personnel as described in the Report of Waste Discharge.

**C. Recycled Water Use Specifications**

1. The Discharger shall operate and manage the recycled water irrigation practices to minimize loss of recycled water from the designated uses or use areas. Recycled water shall not escape from the use areas by airborne spray, surface, or subsurface flow, except in minor amounts associated with sound irrigation practices.
2. Spray, mist or runoff of recycled water will not enter dwellings or impact designated outdoor eating areas, drinking fountains or food handling facilities.
3. The Discharger shall adequately post signs informing the public, workers or other persons present at the Facility about the presence and use of recycled water. Signs will be posted in areas where recycled water is accessible to such persons and at points of access to the Facility. The signs will be at least four inches high by eight inches wide, and include the following wording at a minimum: "RECYCLED WATER – DO NOT DRINK". Each sign shall also display an international "Do Not Drink" symbol.
4. The landscape irrigation shall be managed to prevent surface ponding of water or other conditions that would facilitate propagation or breeding of mosquitoes or other vectors of health significance.

**D. Provisions**

1. The Discharger shall comply with all sections of this Order as of the effective date of the Order.
2. The Discharger shall maintain a copy of this Order at the Facility so that it will be available at all times to personnel operating and maintaining treatment and use facilities.
3. The Discharger shall maintain in good working order and operate as efficiently as possible any treatment, disposal, and monitoring facility or control system installed to achieve compliance with these requirements.
4. The Discharger shall comply with the attached monitoring and reporting program, as adopted by the Water Board and as may be amended by the Executive Officer, pursuant to Water Code section 13267.
5. The Discharger shall provide adequate supervision and training of employees to assure proper operation and maintenance of the Recycled Water Facility and distribution and use systems. A complete record of training and related licenses or certifications of qualifications shall be maintained by the Discharger.
6. Notification of Proposed Changes  
The Discharger shall notify the Water Board and CDPH of any proposed material changes in the recycled water production, distribution or use.
  - a. The Discharger shall submit to CDPH, at least 90 days prior to the anticipated material changes, a supplemental Engineering Report for CDPH technical review, comment and approval.
  - b. The Discharger shall submit a copy of the supplemental Engineering Report and related CDPH correspondence to the Water Board.
7. Operation and Maintenance Manual  
The Discharger shall develop and maintain an Operation and Maintenance (O&M) Manual for the entire recycled water treatment, distribution and use equipment and facilities.
  - a. The Discharger shall assure that the O&M Manual is available to and followed appropriately by all personnel responsible for operation or maintenance of the recycled water production, distribution and use facilities.
  - b. The Discharger shall submit to the Water Board documentation of O&M Manual completion as follows:
    - 1) No later than 30 days after initial start-up of the Recycled Water Facility; and
    - 2) No later than 60 days after any subsequent material changes to the recycled water production, distribution or use facilities.
8. Adverse Condition Reporting.  
The Discharger shall notify the Water Board immediately whenever an adverse condition occurs in the production, distribution or use of the recycled water. An adverse condition includes but is not limited to a release of recycled water other than as allowed by the Order

or other non-compliance event. The initial notification shall be completed within 24 hours of discovery by telephone, email, fax transmittal, or in person.

A follow-up report shall be submitted, in print or electronically, within two weeks after the initial notice or as directed otherwise by Water Board staff in writing. The report must include, but shall not be limited to, the following information:

- a. The reasons for the non-compliance;
- b. Actions taken to correct the problem and the dates thereof; and
- c. Actions that have been or will be taken to prevent the problem from recurring.

9. Title 22 Water Recycling Criteria Compliance

The Discharger shall construct, operate and maintain the Recycled Water Facility in compliance with the Title 22 Water Recycling Criteria.

10. Recycled Water Facility Monitoring.

The Recycled Water Facility shall include the following monitoring and reporting:

- a. The combined filter effluent turbidity shall be monitored and recorded continuously by an on-line turbidimeter and analyzer.
- b. The disinfection CT shall be monitored and recorded continuously.
- c. The disinfected combined filtered effluent bacteriological quality shall be monitored and recorded by daily sample and analysis for total coliform bacteria.

11. Cross Connection Control Testing Requirements

- a. Prior to the initial operation of the recycled water system and annually thereafter, the Facility shall be surveyed for potential cross-connections or other cross-hazards to the potable water supply system that have not been identified and abated by cross-connection control devices.
- b. All cross-connection control devices shall be tested on an annual basis by a certified cross-connection control specialist.

12. The Discharger shall permit the Water Board or its authorized representative in accordance with Water Code section 13267(c):

- a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;
- b. Access to and copy of, at reasonable times, any records required to be kept under the terms and conditions of this Order;
- c. Inspection, at reasonable times, of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; or
- d. To photograph, sample or monitor, at reasonable times, for the purpose of assuring compliance with this Order.

13. The Discharger shall notify the Water Board, in writing, of any change in contact information or change in control or ownership of the land or water recycling facilities presently owned or controlled by the Discharger. The Discharger shall include in the notice the name and contact information of the new owner or new responsible party, and the effective date of the changes.

14. This Board will review this Order periodically and may revise the requirements as necessary to comply with changing State or Federal laws, regulations, policies, or guidelines; changes in the Water Board's Basin Plan; or changes in the discharge characteristics.
15. After notice and opportunity for a hearing, this Order may be terminated or modified for cause including, but not limited to:
  - a. Violation of any term or condition contained in this Order;
  - b. Obtaining this Order by misrepresentation, or failure to disclose fully all-relevant facts;
  - c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized reuse; or
  - d. Endangerment to public health or environment that can only be regulated to acceptable levels by Order modifications or termination.

I, Bruce H. Wolfe, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on \_\_< adoption date >\_\_.

Bruce H. Wolfe  
Executive Officer

Attachments:

1. Figure 1, Location Map
2. Figure 2, Flow Diagram
3. Self-Monitoring Program

CIWQS Place No. 785242

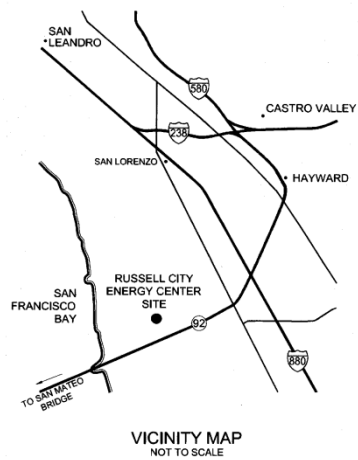
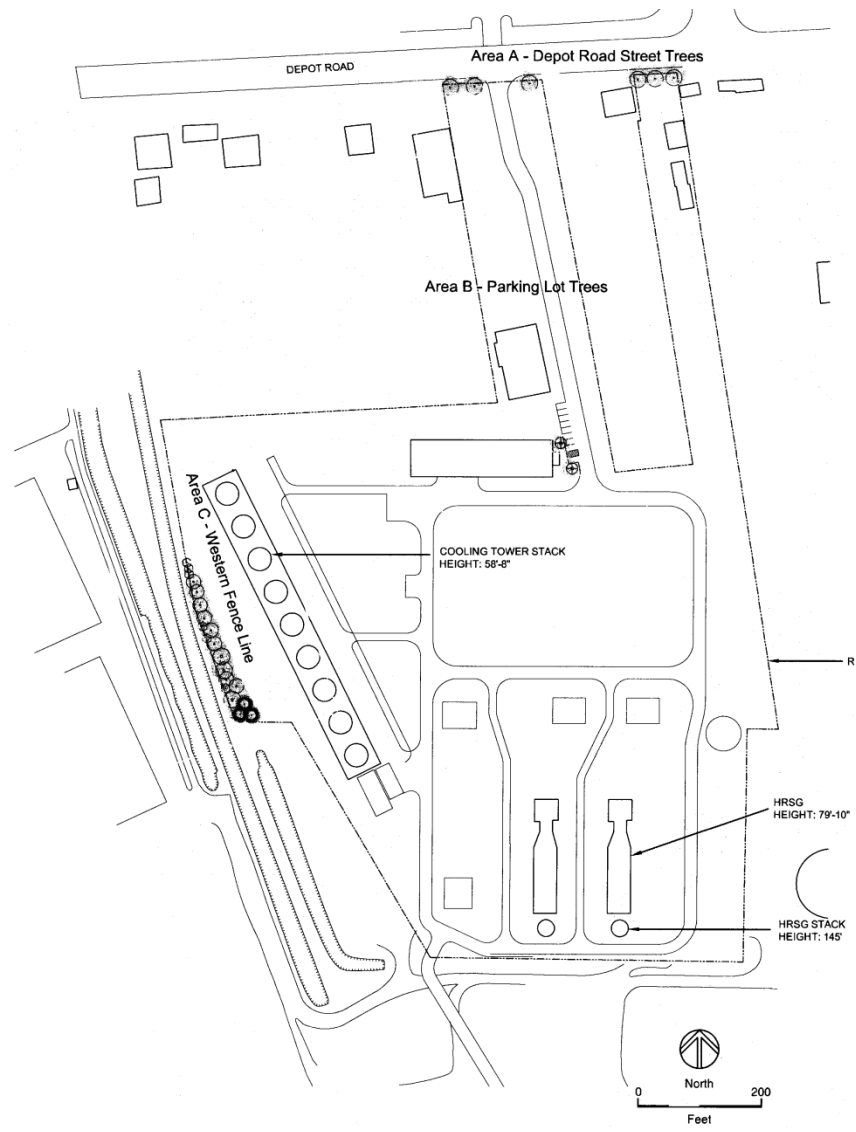


FIGURE 1. RUSSELL CITY ENERGY CENTER - LOCATION MAPS





CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

**MONITORING and REPORTING PROGRAM**

**Of**

**ORDER No. R2-2013-XXXX**

**WATER RECYCLING REQUIREMENTS  
FOR  
RUSSELL CITY ENERGY COMPANY LLC, and  
RUSSELL CITY CENTER RECYCLED WATER FACILITY,  
HAYWARD, ALAMEDA COUNTY**

January 2013

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I. PURPOSE

1. This monitoring and reporting program (Program) is for water recycling requirements adopted by the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board).
2. The principal purposes of a monitoring and reporting program are to guide a waste discharger in doing the following:
  - a. Document compliance with water recycling requirements and prohibitions established by the Water Board; and
  - b. Prevent and abate, in a self-directed manner, pollution or potential threats to water quality arising from water recycling.
3. Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13268, 13383, and 13387(b) of the California Water Code, and Water Board Resolution No. 73-16.

II. SAMPLING and ANALYTICAL METHODS

1. Sample collection, storage, and analyses shall be performed according to Code of Federal Regulations Title 40, Section 136 (40 CFR 136), or other methods approved and specified by the Executive Officer of the Water Board (Executive Officer).
2. Water and waste analyses shall be performed by a laboratory approved for these analyses by the California Department of Public Health (CDPH), or by a laboratory waived by the Executive Officer from obtaining such certification for these analyses, or as otherwise specified in this Program.
3. The director of the laboratory whose name appears on the certification, or the laboratory supervisor who is directly responsible for the analytical work performed, shall supervise all analytical work. This includes supervising all appropriate quality assurance/quality control procedures in the laboratory. The laboratory director (or directly responsible supervisor) shall sign all reports submitted to the Water Board.
4. Measurements by use of portable analytical equipment such as field instruments is acceptable for selected parameters, given the following conditions:
  - a. The analytical equipment is appropriate for the given analysis and water or waste;
  - b. The analytical equipment is properly maintained and calibrated;
  - c. The equipment user is knowledgeable of proper sampling and equipment use practices; and
  - d. Written notification of the intended use has been provided in advance to Water Board staff, and Water Board staff voices no objections.
5. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

### III. DEFINITIONS

The following are definitions and explanations of terms used in this monitoring program.

#### A. DISCHARGER and FACILITY

NOTE: The following are simplified descriptions, for reference purposes.  
Additional, more complete, descriptions are given in the findings of this Order.

##### 1. Discharger

The Discharger subject of this Program is Russell City Energy Company LLC. The Discharger is the producer, distributor and user of recycled water for the Russell City Energy Center recycled water project. The Discharger is responsible for implementing this Program.

##### 2. Facility

The Facility is the Russell City Energy Center Recycled Water Facility that produces disinfected tertiary recycled water, and associated recycled water distribution and use equipment and areas located within the Russell City Energy Center property.

#### B. TYPES OF SAMPLES

##### 1. Flow Measurement

Flow measurement is the accurate measurement of the rate—flow volume over time elapsed—by a properly calibrated and maintained flow-measuring device. Flow measurement from a properly calibrated and maintained automated pump-use recording device, such as a pump dose event counter, for a properly calibrated and maintained pump, is acceptable.

##### 2. Grab Sample

A grab sample is defined as an individual sample collected in a short period of time not exceeding 15 minutes. Grab samples are used primarily in determining compliance with instantaneous maximum or minimum limits, and also for bacteriological limits. Grab samples represent only the condition that exists at the time the sample is collected.

##### 3. Composite Sample

A composite sample is defined as a sample composed of individual grab samples. In a flow-weighted composite, the grab samples are mixed in proportions varying not more than plus or minus five percent from the instantaneous rate of flow corresponding to each grab sample. The grab samples used for the composite must be collected at regular intervals not greater than one hour. Alternatively, the grab samples may be collected with a continuous automatic sampling device capable of attaining the proportional accuracy stipulated above throughout the sampling period. In a time-sequenced composite sample, individual grab samples of specified volume, typically uniform, are obtained at specified time intervals, typically uniform. The sampling period for all composite samples is 24 hours unless specified otherwise in writing by the Executive Officer.

4. Observations

Observations are primarily visual observations and inspection of conditions. Observations may include recording measurements from monitoring devices, for example, determining freeboard from a water-level staff gauge, or determining precipitation from a rain gauge.

C. SAMPLING FREQUENCY

Term	Meaning
1. Continuous	Continuous monitoring.
2. Daily	One time each calendar day.
3. Weekly	One time per calendar week, with sampling interval of at least five days.
4. Monthly	One time per calendar month, with sampling interval of at least four weeks.
5. Quarterly	One time per calendar quarter, at intervals of about three months.

D. MONITORING and REPORTING TIME PERIODS

1. Daily The Daily time period is a 24-hour period associated with a calendar day. The 24-hour period may overlap calendar days (e.g., 8 am of one day to 8 am of the next), but shall be consistent from one sampling event to the next.
2. Weekly The Weekly period is a 7-day calendar week.
3. Monthly The Monthly time period is each respective calendar month.
4. Annual The calendar year.

E. ABBREVIATIONS USED IN THIS PROGRAM

1. Type of Sample Abbreviations
  - a. C-24 = Composite Sample over 24-hours
2. Parameter Abbreviations
  - a. BOD<sub>5</sub> = Biochemical Oxygen Demand, 5-day, at 20 °C
  - b. TSS = Total Suspended Solids.
  - c. CT = The mathematical product of total chlorine residual concentration in mg/L and modal contact time in minutes
3. Unit Abbreviations
  - a. mg/L = milligrams per liter
  - b. MPN/100 ml = Most Probable Number per 100 milliliters
  - c. NTU = Nephelometric Turbidity Units
  - d. mg-min/L = Milligram-minutes per Liter, the units for CT values
4. Sampling Frequency Abbreviations
  - a. Cont. = Continuous
  - b. D = Daily
  - c. W = Weekly
  - d. 3/W = three times per week
  - e. M = Monthly
  - f. Q = Quarterly

## F. STANDARD OBSERVATIONS

1. Signs  
Inspect for proper condition of signs warning the public, employees and other persons that recycled water is being used.
2. Control  
Evidence of loss of control of the recycled water, such as recycled water escaping the use area through surface runoff or airborne spray (show affected area on a sketch)

## IV. MONITORING STATIONS

A sketch showing locations of all stations described below shall accompany the first monitoring report, and subsequent reports when locations are added or changed, or whenever a violation is reported.

STATION	DESCRIPTION
---------	-------------

### A. RECYCLED WATER FACILITY

- |                   |   |
|-------------------|---|
| 1. Influent       | Influent to the Recycled Water Facility.  |
| 2. Filtered Water | Recycled Water within the Recycled Water Facility, following filtration, prior to disinfection.   |
| 3. Disinfection   | Recycled Water in the disinfection process suitable for monitoring disinfection process performance including chlorine residual concentration, modal contact time, and CT values. |
| 4. Recycled Water | Disinfected Tertiary Recycled Water following all required treatment and disinfection processes and representative of the recycled water to be distributed and used.              |

### B. RECYCLED WATER USE AREAS

- |                |  |
|----------------|--|
| 1. Power Plant | At the power plant where recycled water is used.                                     |
| 2. Landscape   | Areas within the Facility where recycled water is used to irrigate landscape plants. |

**V. MONITORING SCHEDULE**

The Discharger is required to sample, analyze, and observe according to the schedule tabulated below in Table 3.

**Table 3 - Schedule for Recycled Water Monitoring**

Parameter	Units	Sample Type	Monitoring Station				
			Influent	Filtered Water	Disinfection Process	Recycled Water	Use Areas
Flow	gallons	cont.	cont.		cont.	cont.	cont.
Turbidity	NTU	cont.	cont.	cont.		cont.	
Chlorine residual	mg/L	cont.			cont.		
Contact Time	minutes	cont.			cont.		
Disinfection CT	mg-min/L	cont.			cont.		
Total Coliform	MPN/100 ml	grab				Daily	
Dissolved Oxygen	mg/L	grab				3/W	
pH	pH units	grab				3/W	
Total Dissolved Solids	mg/L	C-24				M	
Biochemical Oxygen Demand	mg/L	C-24				M	
Total Suspended Solids	mg/L	C-24				M	
Total Nitrogen	mg/L as N	C-24				M	
Standard Observations							W

## VI. MONITORING SPECIFICATIONS

### A. MONITORING and REPORTING DETAILS

#### 1. Continuous Monitoring

Continuous monitoring means that the required observations, sampling or analyses are conducted on an ongoing basis. Data obtained from continuous monitoring shall be recorded and stored appropriately. For purposes of reporting the data in routine monitoring reports submitted to the Water Board, the data shall be presented as maximum, minimum and average values for each day of monitoring.

#### 2. Flow Monitoring and Reporting

Flows shall be monitored continuously during active use, and reported as Daily Flow, in million gallons per day (or gallons per day if more appropriate) for each day when flow occurs, and Monthly Total, in million gallons.

#### 3. Sampling

- a. Sampling for monitoring analyses is required only when the identified part(s) or component(s) of the wastewater system associated with a given monitoring station is (are) in use.
- b. Sampling for the following parameters shall be conducted by means of 24-hour flow-weighted or time-sequenced composite samples: BOD, TSS, and Nitrogens.

#### 4. Nitrogens

- a. The parameter 'Nitrogens' in this Program means all of the following parameters:
  - (1) Ammonia Nitrogen,
  - (2) Nitrate Nitrogen, and
  - (3) Total Kjeldahl Nitrogen.
- b. Analytical results for the nitrogen parameters shall be reported as "mg/L as nitrogen".

#### 5. Precipitation

Precipitation (rainfall) monitoring shall be continuous and recorded and reported as total rainfall for each calendar day and as the total for each calendar month. Precipitation monitoring shall be representative of precipitation falling on recycled water use areas.

### B. CROSS CONNECTION CONTROL PRACTICES

1. Prior to the initial operation of the recycled water system and annually thereafter, the Facility shall be surveyed for potential cross-connection hazards that have not previously been identified and abated by cross-connection control devices.

2. All cross-connection control devices shall be tested on an annual basis by a certified cross-connection control specialist.
3. The results of the above testing shall be reported in the annual monitoring report to the Water Board.

#### C. INCREASED MONITORING FREQUENCY

1. The Discharger is required to increase monitoring frequency to at least twice the normal frequency if either of the following happens:
  - a. Any monitoring indicates a violation of water recycling requirements or unstable wastewater system operation or performance; or
  - b. Any specified samplings or analyses are not completed as required.
2. If either scenario given as 1.a or 1.b. above occurs, monitoring for the parameter(s) and monitoring station(s) in concern shall immediately and henceforth be conducted at the increased frequency. This increased monitoring frequency shall be maintained for the following periods of time:
  - a. At least two sampling events; and
  - b. Until such time as the results of monitoring indicate violations are no longer occurring or the problem has been corrected and the recycled water system has returned to stable operation and performance.

#### D. MONITORING BY USE OF AUTOMATED INSTRUMENTS

Monitoring by the use of automated analytical instruments is acceptable under the following conditions: The instruments are capable of providing the required data, properly maintained, periodically calibrated to ensure accurate measurements, and their use is documented in the Operation and Maintenance Manual.

#### E. MODIFICATION OF MONITORING PRACTICES

Modifications of the monitoring practices specified in this Program may be authorized by the Executive Officer in consideration of acceptable accumulated data and acceptable alternate means of monitoring. Factors to be considered include: data quality, adequate characterization of the identified recycled water system process, consistency of system performance, compliance with water recycling requirements, and acceptable means for providing equivalent and adequate monitoring of the identified recycled water system process. Requests for modification of monitoring practices must be submitted to the Water Board Executive Officer in writing, with a technical report that includes evaluation of accumulated data, and a complete description of proposed alternate means of monitoring. Proposed modifications of monitoring practices must be approved in writing by the Executive Officer prior to implementation.



VII. REPORTS to be SUBMITTED to the WATER BOARD

A. MONITORING REPORTS

The Discharger shall submit to the Water Board monitoring reports documenting the recycled water treatment, distribution and use systems operation and performance, and compliance with requirements, in accordance with the following:

1. Report Schedule

a. Quarterly Reports

Written reports shall be prepared for each calendar quarter and shall be submitted to the Water Board by the last day of the month following the monitoring period.

b. Annual Reports

Written reports shall be prepared for each calendar year monitoring period and shall be submitted to the Water Board by February 28 following the monitoring period.

2. Transmittal Letter

A letter of transmittal shall accompany each monitoring report submitted to the Water Board. The transmittal letter shall include the following:

a. Facility, Monitoring Period and Contact Information.

Identification of the following:

- (1) The discharge facility by name and address;
- (2) The monitoring period being reported;
- (3) The name and telephone number of a person familiar with the report and the current status of the recycled water system, for follow-up discussions as may be needed; and
- (4) The name of the Water Board staff case handler.

b. Operation and Maintenance Activities

Discussion of all major operation and maintenance activities that occurred during the reporting period (e.g., repair or replacement of system equipment) including dates and completion status of actions taken.

c. Violations or Problems

Discussion of any violations of water recycling requirements, and any problems or unusual conditions that occurred during the reporting period. This shall include reporting the following information:

- (1) Date and time of occurrence;
- (2) Location of occurrence shown on a scaled plan drawing of the facility site;
- (3) Description of the violation, problem or unusual condition;
- (4) Corrective actions taken or planned to correct the violation, problem, or unusual condition and a time schedule for implementation of these actions.

Actions may include increased monitoring and any changes to recycled water system equipment or operations.

If a report describing corrective actions and/or a time schedule for implementation of those actions was previously submitted to the Water Board, then reference to that report is satisfactory. References to previously submitted reports shall include the date, title or subject, and author of the report, and date submitted to the Water Board.

d. Transmittal Letter Signature(s)

(1) The transmittal letter shall be signed by

- (a) The Discharger's principal executive officer, ranking elected official or duly authorized representative, and
- (b) The recycled water facility chief plant operator.

(2) The transmittal letter signatures shall be accompanied by the following statement:

"I certify under penalty of law that this document and all attachments have been prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

3. Results of Analyses and Observations

Each report shall include results of analyses and observations in accordance with the following specifications:

a. Monitoring Results

Each monitoring report shall include tabulations of results from all required analyses, measurements and observations specified in this Program for the reporting period, including the following details:

- (1) Date of sampling or observation;
- (2) Location of sampling or observation (sample station);
- (3) Parameter of analysis (e.g., pH, Dissolved Oxygen, etc.); and
- (4) The result of the analysis, measurement or observation.

b. Data Presentation

In reporting monitoring data, the data shall be arranged in tabular form so that the data are clearly discernible. The data shall be summarized in a manner to illustrate clearly whether the discharge is in compliance with water recycling requirements and this Program. Reporting shall include maximum, minimum and monthly average values for each parameter for which more than one sample result is obtained during the monitoring period.

- c. **Sample Analysis Data**  
For all sample analyses, include the following information:
    - (1) Date of analysis;
    - (2) Individual or contract laboratory conducting the analysis;
    - (3) Analytical procedure or method used, and test method detection level; and
    - (4) Copies of laboratory analysis result reports for all analyses conducted by a contract laboratory.
  - d. **Reporting Results Below Detection Limits**  
For all analytical characterizations (laboratory tests) for which results are identified as below limits of detection of the test procedure, data reporting shall include the limit of detection. In other words, reporting a sample test result as only “ND”, or “not detected” or similar, is not acceptable; the actual numeric value of the detection limit must also be reported. It is acceptable to use notations of non-detection (“ND” or similar) in data tables, provided that the corresponding limit of detection is clearly identified elsewhere in the table, or as a footnote of the table.
  - e. **Additional Monitoring Results**  
If any parameter is monitored more frequently than is required by this Program, then the results of such monitoring shall be included in the monitoring reports and in any calculations of statistical values.
4. **Identification of Monitoring Stations**  
Each report shall include a scaled and legible plan view drawing of the facility site showing the locations of all monitoring stations at which monitoring is required by this Program.
5. **Annual Monitoring Report**  
The annual monitoring report shall include the following:
- a. Tabular and graphical summaries of the monitoring data obtained during the period being reported.
  - b. A discussion of recycled water system performance and record of compliance with the requirements specified by this Order, including monitoring and reporting requirements.
  - c. For any event of non-compliance with requirements specified by this Order, including monitoring and reporting requirements, the report shall include description of corrective actions taken or planned to achieve full compliance, and a time schedule of when those actions were or will be taken.

## B. REPORTS OF VIOLATIONS

1. The Discharger shall notify the Water Board immediately whenever the Discharger violates or threatens to violate requirements of this Order or Program or an adverse condition occurs in the production, distribution or use of the recycled water. An adverse condition includes but is not limited to a release of recycled water other than as allowed by the Order. An adverse condition also includes any other non-compliance event.
2. The initial notification shall be conducted by telephone, email, fax transmittal, or in person, and shall be completed within 24 hours of discovery.
3. A follow-up report shall be submitted, in print or electronically, within two weeks after the initial notice or as directed otherwise by Water Board staff in writing. The report must include, but shall not be limited to, the following information:
  - a. The reasons for the non-compliance;
  - b. Actions taken to correct the problem and the dates thereof; and
  - c. Actions that have been or will be taken to prevent the problem from recurring.

## C. WATER BOARD ADDRESS and PHONE NUMBER

The Water Board's current office mailing address and phone number are given below. This is the address to be used for submittal of reports and correspondence to the Water Board.

1. Address: California Regional Water Quality Control Board,  
San Francisco Bay Region  
1515 Clay Street, Suite 1400  
Oakland, CA 94612.
2. Phone: (510) 622 - 2300.

VIII. MONITORING PROGRAM CERTIFICATION

I, Bruce H. Wolfe, Executive Officer, hereby certify that this Monitoring and Reporting Program:

1. Has been developed in accordance with the procedure set forth in the Water Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements for the subject wastewater systems.
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 on the following date: \_\_\_\_\_.

\_\_\_\_\_  
BRUCE H. WOLFE  
Executive Officer