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Arnold Schwarzenegger
Governor

ORDER NO. R1-2011-0006
NPDES PERMIT NO. CA0023345

MODIFICATIONS OF ORDER NO. R1-2007-0013

FOR

TOWN OF WINDSOR WASTEWATER TREATMENT, RECLAMATION AND DISPOSAL SYSTEM

The California Regional Water Quality Control Board, North Coast Region, hereinafter referred to as the Regional Water Board, finds that:

1. The Town of Windsor (hereinafter Discharger) is currently discharging treated wastewater from the Town of Windsor Treatment, Reclamation and Disposal System (hereinafter WWTF) under Order No. R1-2007-0013 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0023345, adopted on June 14, 2007 (hereinafter Permit). The Permit will expire on August 12, 2012.

2 The WWTF provides tertiary treatment and ultraviolet light disinfection and has an average dry-weather design capacity of 2.25 million gallons per day (mgd). The Permit includes two authorized discharge methods: discharge to Mark West Creek at the Trenton-Healdsburg bridge at no more than one-percent of the flow of the receiving water during the period of October 1 through May 14 and delivery to the Discharger's reclamation system for urban and agricultural irrigation during the period of May 15 through September 30 and other times of the year when weather conditions allow reclamation to occur in compliance with Permit requirements.

3. The Discharger has requested that the Regional Water Board make the following modifications to the existing Permit:

   a. Modification of final copper effluent limitations for discharges to Mark West Creek based on the Discharger's development of a discharger-specific water effect ratio (WER), as allowed by Provision VI.C.7 of the Discharger's Permit. The Discharger's request is to reevaluate reasonable potential for copper based on inclusion of the discharger-specific WER and use of effluent hardness, and if necessary to derive final copper effluent limitations utilizing the WER and effluent hardness.

b. Modification of the Permit to add the Geysers Project as a new permitted discharge to the Geysers pipeline operated by the City of Santa Rosa, with an initial average daily flow capacity of 0.53 mgd and the ability to increase to 0.75 mgd; and

c. Addition of new tables 9a and 9b to the Permit to reflect the reliability and increased disposal capacity that the Geysers Project provides. Accordingly, the Discharger requests that the permitted capacity of the Town's WWTF be increased from 1.6 mgd to 1.9 mgd.

4. The request for modification of final copper effluent limitations and supporting documentation is included in the following documents submitted by the Discharger:

a. October 2009 report titled *Town of Windsor Wastewater Treatment, Reclamation, and Disposal Facility Copper Water-Effect Ratio Study* submitted on October 28, 2009.

b. January 4, 2010, memorandum titled *Technical Basis for Implementation of a Discharger-specific Copper WER* prepared by the Discharger's consultant. and

c. July 21, 2010 letter and Report of Waste Discharge submitted by Craig Scott, Town of Windsor, Reference: Amendment to Order No. R1-2007-0013/NPDES No. CA0023345.

5. The request for modification of the Permit to add the Geysers Project as a new permitted discharge and associated changes to Table 9 of the Permit and authorization for increased capacity and supporting documentation are included in the following documents submitted by the Discharger:

a. February 11, 2009 letter to the Regional Water Board Executive Officer stating the Town's intent to move forward with the Geysers Recharge Connection Project.

b. October 15, 2009 Draft Technical Memorandum prepared by RMC Water and Environment; and

c. July 21, 2010 letter and Report of Waste Discharge submitted by Craig Scott, Town of Windsor, Reference: Amendment to Order No. R1-2007-0013/NPDES No. CA0023345, which also includes a July 14, 2010 Memorandum prepared by RMC Water and Environment describing the technical basis for modifying the Permit to include the Geysers Project discharge and associated increase in permitted capacity.

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6. The Regional Water Board has reviewed the Permit modification requests and finds that the Discharger's proposed requests for modification are appropriate.

7. The Permit establishes final effluent limitations for copper in accordance with the California Toxics Rule and procedures established in the State Water Board *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (State Implementation Policy or SIP). Section 1.2 of the SIP allows the Regional Water Board to adjust the criteria/objective for metals with discharger-specific Water Effect Ratios (WER) established in accordance with U.S. EPA guidance as described in *Interim Guidance on Determination and Use of Water Effect Ratios for Metals* (EPA-823-B-94-001) or *Streamlined Water Effect Ratio Procedure for Discharges of Copper* (EPA-822-R-01-005) (Streamlined Procedure). These guidance documents identify procedures to determine site-specific values for a WER, a criteria adjustment factor accounting for the effect of site-specific water characteristics on pollutant bioavailability and toxicity to aquatic life.

8. A 2006 Study[1] demonstrates that for certain hardness-dependent metals, including copper, any mixture of receiving water that is compliant with water quality objectives for that metal and effluent that is compliant with water quality objectives for that metal, will always result in compliance with water quality objectives. The 2006 Study also demonstrates that it is always protective to determine reasonable potential, and calculate effluent limitations, if needed, based on effluent hardness. The Regional Water Board finds that the methodology presented in the 2006 Study is appropriate to apply to the reasonable potential analysis and calculation of effluent limitations, if needed, for the Discharger.

9. During the term of the Permit the Discharger conducted an individual WER study to determine the site-specific toxicity of copper in the receiving water at the point of discharge. The study concluded that a site-specific WER of 3.42 for total recoverable copper and 3.24 for dissolved copper apply to the discharge. The Regional Water Board evaluated the results of the study and determines that (1) the results of the study are within the expected range for a WER for a municipal wastewater discharge; (2) the study was conducted in accordance with applicable USEPA guidance established in the Streamlined Procedure; and (3) the results of the study are supported by data that generated scientifically defensible results.

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1 Emerick, R.W.; Booroum, Y.; & Pedri, J.E., 2006. California and National Toxics Rule Implementation and Development of Protective Hardness Based Metal Effluent Limitations. WEFTEC, Chicago, Ill.

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Based on this new information, effluent copper concentrations no longer demonstrate reasonable potential to exceed water quality criteria for copper.

10. The Permit establishes limitations on the amount of treatment capacity that the Discharger is authorized to utilize based on the fact that the Discharger's reclamation/disposal system has a rated capacity of 1.6 mgd. The Permit contains a table (Table 9) that identifies the amount of storage capacity and irrigation area that the Discharger must have in order to receive authorization from the Regional Water Board Executive Officer to increase its use of treatment capacity.

11. The Discharger's July 14, 2010 Memorandum demonstrates that additional equivalent storage capacity will be gained through the establishment of a new discharge point to the Geysers Project and that an increase in WWTF treatment capacity from 1.6 to 1.9 mgd is reasonable and defensible.

12. Provision VI.A.2.c of Order No. R1-2007-0013 requires the Discharger to file a petition with the State Water Board, Division of Water Rights prior to making any change in the point of discharge, place of use, or purpose or use of treated wastewater that results in a decrease of flow in any portion of a watercourse and receive approval for such a change in accordance with California Water Code section 1211. The Discharger filed with the State Water Board, Division of Water Rights a wastewater change petition to add the Geysers Recharge Project as a place of use and geothermal power generation as an additional purpose of use of the Discharger's treated wastewater that could result in decreased flow to Mark West Creek. On November 10, 2010, the State Water Board Division of Water Rights filed a Notice of Determination approving the Discharger's request.

13. Conditions that support a modification of an NPDES permit are described in 40 CFR 122.62 and include circumstances where new information that was not available at the time of permit issuance would have justified different permit conditions at the time of issuance. Since the Permit was adopted, the Discharger has performed a study, in accordance with USEPA procedures, to determine a site-specific WER for the WWTF, providing new information that was not available at the time of Permit issuance. As explained herein, this new information would have justified new permit conditions at the time of issuance because, with the application of the WER, there is no reasonable potential for toxicity to organisms from copper in the effluent. Accordingly, at the time of Permit issuance, no effluent limitations for copper would have been included in Order No. R1-2007-0013.

14. Provision VI.C.1.e of the Permit includes a reopener provision that allows the Regional Water Board to reopen the Permit and make modifications in accordance with 40 CFR Section 122.62, if a water effect ratio, mixing zone or other water

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quality study provides new information and a basis for determining that a permit condition or conditions should be modified.

15. This Order, which modifies Order No. R1-2007-0013 to remove copper effluent limitations for copper is consistent with antibacksliding requirements set forth in 40 CFR section 122.44. Effluent limitations for copper have been removed from the Permit based upon site-specific conditions at the Discharger's facility. The new information provided by the Discharger demonstrates that based upon the relative bioavailability of copper to aquatic organisms; there is no reasonable potential for toxicity to those organisms from copper at concentrations detected in the effluent. Therefore, the protection afforded under the modified permit results in a level of protection for beneficial uses equal to the previous conditions of Order No. R1-2007-0013. Additionally, this Order is consistent with section 303 (d)(4)(B) of the Clean Water Act, which allows for changes to effluent limitations or other permitting standards provided that the quality of receiving waters equals or exceeds levels necessary to protect the beneficial uses for such waters and the change is consistent with the antidegradation policy. Consistency with the anti-degradation policy is addressed in Finding 16.

16. The antidegradation policy provides that the lowering of water quality can be allowed only if beneficial uses are protected, and if there is a maximum benefit to the people of the state. While the removal of the effluent limits may result in a slight increase in the amount of copper discharged to the water body when compared with the amount that would be discharged in compliance with the effluent limitations in the Permit prior to this modification, the removal of effluent limitations is predicated on a finding that there is no reasonable potential for toxicity to organisms from copper in the effluent. Accordingly, this action will result in no less protection of beneficial uses and will maintain water quality. In addition, the Discharger has evaluated potential sources in an effort to further reduce copper concentrations in the effluent.

    Furthermore, Discharges regulated in accordance with this Order are for a publicly owned treatment works (POTW). The significant increase in costs for additional treatment that would be required to remove low levels of copper are not in the best interest of the public given that beneficial uses are already shown to be protected and because any resources available for water quality improvements should be used for nonattainment waters or other pressing water quality issues as opposed to treating effluent beyond what is required for protecting beneficial uses.

    The activities allowed in accordance with these modifications to the waste discharge requirements apply to existing facilities. Discharges from the WWTF will

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be required to maintain protection of the beneficial uses of the receiving water and comply with applicable provisions of the Basin Plan.

17. The State Water Board amended the SIP in 2005 to allow WERs to be established through the normal NPDES permit modification processes, rather than through the Basin Planning process. The procedures followed to develop the copper WER identified in this Order are consistent with the amended SIP requirements and consideration of California Water Code section 13241 factors and compliance with the California Environmental Quality Act (CEQA) is not required. Under Water Code section 13389, this action to modify an existing NPDES permit is exempt from the provisions of Chapter 3 of CEQA.

    The Geysers Project was previously evaluated in the Discharger's October 2000 Environmental Impact Report (EIR) for the *Town of Windsor Water Reclamation Master Plan for Treatment, Storage, and Disposal* and October 2008 *Initial Study/Addendum for the Geysers Recharge Pipeline Connection Project*. The Discharger, acting as lead agency, certified the EIR and Addendum on February 7, 2001 and November 5, 2008, respectively. As a responsible agency, the Regional Water Board is required to consider an EIR adopted by the lead agency for a project in determining whether to approve the project. A responsible agency has responsibility for mitigating and avoiding only the direct and indirect environmental effects of those parts of the project which it decides to carry out, finance, or approve. To this end, the responsible agency must make findings as required by CEQA Guidelines section 15091 and, if necessary, section 15093 for each and every significant impact of the project. The Regional Water Board has independently considered those sections of the EIR and Addendum relating to the Geysers Project's impacts on water quality and finds that, based on the mitigation measures identified in the EIR and Addendum and contained in the Permit, all impacts to water quality directly or indirectly related to the Geysers Project will be reduced to less than significant levels and beneficial uses will be protected.

18. Pursuant to 40 CFR Sections 124.5(c)(2) and 122.62, only those conditions to be modified by this amendment shall be reopened with this amendment. All other aspects of the existing Permit shall remain in effect and are not subject to modification by this amendment.

19. The Staff Report for this Order (Attachment 1) includes additional explanatory information in support of this Permit modification and is incorporated as part of this Order.

20. The Discharger and interested agencies and persons have been notified of the Regional Water Board's intent to modify waste discharge requirements for the

existing discharge and have been provided opportunities for public meetings and to submit their written views and recommendations. Notification was provided through posting on the Regional Water Board's Internet site at: http://www.waterboards.ca.gov/northcoast/public_notices/public_hearings/npdes_permits_and_wdrs.shtml and through publication in the Press Democrat on November 15, 2010.

21. On January 27, 2011, after due notice to the Discharger and all other affected persons, the Regional Water Board conducted a public hearing and evidence was received regarding modification of Order No. R1-2007-0013.

IT IS HEREBY ORDERED that the Discharger, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act as amended, shall comply with the following revisions identified in underline and strikeout format to indicate language to be added to and deleted from Order No. R1-2007-0013:

A. Modification of Final Copper Effluent Limitations

1. Order Section IV.A.3.b, Table 8, Footnote 4, Effluent Limitations and Discharge Specifications, Effluent Limitations, Final Effluent Limitations – Discharge Point 002, Effluent Limitations for Protection of Aquatic Life is amended as follows:

   No final effluent limitations for protection of aquatic life are required, based on a determination of no reasonable potential as presented in Fact Sheet section IV.C.3.b. .~~During periods of discharge to receiving waters, representative samples of advanced treated wastewater collected at Monitoring Location EFF-002 shall not contain constituents in excess of the following limits:~~

~~Table 8. Final Effluent Limitations for Discharge Point 002 for Protection of Aquatic Life~~

~~Parameter~~	~~Units~~	~~Effluent Limitations[4]~~				
		~~Average Monthly~~	~~Average Weekly~~	~~Maximum Daily~~	~~Instantaneous Minimum~~	~~Instantaneous Maximum~~
~~Copper~~	~~µg/L~~	~~See Attachment E-1~~	~~--~~	~~See Attachment E-1~~	~~--~~	~~--~~

Footnote 4: Effluent limitations for copper are for the total recoverable metal fraction and are determined using formulas that are based on the hardness of the receiving water at the time the discharge is sampled.

2. Attachment E – Monitoring and Reporting Program (September 20, 2007 Revision) Section IV.B, Effluent Monitoring Requirements, Monitoring Location EFF-002 is amended to include effluent monitoring for hardness as follows:

Table E-4. Effluent Monitoring for Monitoring Location EFF-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
BOD (20° C, 5-day)	mg/L	Grab	Weekly	Standard Methods
Total Suspended Solids	mg/L	Grab	Weekly	Standard Methods
Hydrogen Ion	pH units	Grab	Daily	Standard Methods
Dissolved Oxygen	mg/L	Grab	Daily	Standard Methods
Chlorine Residual	mg/L	Grab	Daily	Standard Methods
Temperature	° C	Grab	Daily	Standard Methods
Ammonia Nitrogen	mg/L	Grab	Monthly	Standard Methods
Unionized Ammonia	mg/L	---	Monthly	Calculation
Nitrate Nitrogen	mg/L	Grab	Monthly	Standard Methods
Organic Nitrogen	mg/L	Grab	Monthly	Standard Methods
Total Phosphorus	mg/L	Grab	Monthly	Standard Methods
Acute Toxicity Bioassay	Percent survival	Grab	Monthly	*See Section V.A*
Chronic Toxicity Bioassay	TUc	Grab	2x/year	*See Section V.B*
Hardness	mg/L	Grab	Monthly, concurrent with copper	Standard Methods
Copper	ug/L	Grab	Monthly	USEPA Method 200.8 (2 ug/L)
Priority Pollutants [2]	ug/L	Grab	1x/year	40 CFR 136
Flow	mgd	Continuous	Daily	Meter
Dilution Rate	% of stream flow	Calculation	Daily	---

3. Remove Attachment E-1 Hardness-Dependent Effluent Limitations for Copper from Order No. R1-2007-0013.

4. Fact Sheet Section III.C.3, Applicable Plans, Policies, and Regulations, State and Federal Regulations, Policies, an Plans, State Implementation Policy is amended to add the following paragraph:

   Section 1.2 of the SIP allows the Regional Water Board to adjust the criteria/objective for metals with discharger-specific Water Effect Ratios (WER) established in accordance with U.S. EPA guidance – Interim Guidance on Determination and Use of Water Effect Ratios for Metals (EPA-823-B-94-001) or Streamlined Water-Effect Ratio Procedure for Discharges of Copper (EPA-822-

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R-01-005) (Streamlined Procedure). The Streamlined Procedure determines site-specific values for a WER, a criteria adjustment factor accounting for the effect of site-specific water characteristics on pollutant bioavailability and toxicity to aquatic life.

5. Fact Sheet section III.C.6. Applicable Plans, Policies, and Regulations, State and Federal Regulations, Policies, and Plans, Anti-Backsliding Requirements is amended to add the following paragraph:

   The protection afforded under the modified permit results in a level of protection for beneficial uses equal to the previous conditions of Order No. R1-2007-0013. Additionally, this Order is consistent with section 303 (d)(4)(B) of the Clean Water Act, which allows for changes to effluent limitations or other permitting standards provided that the quality of receiving waters equals or exceeds levels necessary to protect the beneficial uses for such waters and the change is consistent with the antidegradation policy. Consistency with the anti-degradation policy is addressed below.

6. Fact Sheet Section IV.C.2.c, Rationale for Effluent Limitations and Discharge Specifications, Water Quality-Based Effluent Limitations (WQBELs), Applicable Beneficial Uses and Water Quality Criteria and Objectives, State Implementation Policy (SIP), CTR and NTR is amended as follows:

Table F-7. Applicable Water Quality Criteria and Objectives for Priority Pollutants Reported in Detectable Concentrations in Windsor's Effluent

CTR No.	Constituent	Lowest Applicable Criteria	Basin Plan Water Quality Objectives (from CCR Title 22, Division 4)	CTR/NTR Water Quality Criteria		
				Freshwater		Human Health for Consumption of
				Acute	Chronic	Water and Organisms
		µg/L	ug/L	µg/L	µg/L	µg/L
6	Copper [ba]	~~10~~ 39.92	---	~~15~~ 61.30	~~10~~ 39.92	1300

Footnote a: Water Quality Criteria for hardness-based metals (except copper) are based on the lowest detected hardness concentration of 110 mg/l and have been converted to total recoverable metal fraction using the conversion factors in the CTR.

Footnote b: Water Quality Criteria for copper is based on the lowest detected effluent hardness concentration of 130 mg/L and has been converted to total recoverable copper fraction using conversion factors in the CTR and a discharger-specific Water

Effect Ratio (WER) of 3.42. See discussion in Fact Sheet Section IV.C.3.b regarding the meaning and development of the WER.

7. Fact Sheet Section IV.C.3.b, Rationale for Effluent Limitations and Discharge Specifications, Water Quality-Based Effluent Limitations (WQBELs), Determining the Need for WQBELs, Priority Pollutants is amended as follows:

Modify first paragraph to add the following sentence at the end of the paragraph:

The copper RPA is also based on additional effluent and receiving water data collected by the Discharger between December 2007 and April 2010.

Modify second paragraph as follows:

Some freshwater water quality criteria for metals are hardness dependent; i.e., as hardness decreases, the toxicity of certain metals increases, and the applicable water quality criteria become correspondingly more stringent. For this RPA, Regional Water Board staff has used a receiving water hardness concentration of 110 mg/L $CaCO_3$, based on receiving water data submitted by the Discharger for all of the hardness-based metals except copper. This Order was modified on January 27, 2011 to revise the copper effluent limitations based on new information as further described in subsequent paragraphs in this section. For copper, staff used an effluent hardness concentration of 130 mg/L based on additional hardness data submitted by the Discharger during the term of this Order. This additional hardness data was collected in conjunction with effluent monitoring for copper as required under this Order. ~~The use of the lowest receiving water hardness concentration provides the most protective approach for determining which parameters to require effluent limitations for the protection of aquatic life in the receiving stream.~~.....Seventeen additional receiving water hardness samples, collected upstream and downstream of the Facility's discharge point between December 2007 and April 2010 showed hardness concentrations between 50 and 175 mg/L.

Add New Paragraphs 3 through 6 as follows:
Hardness
The California Toxics Rule and the National Toxics Rule contain water quality criteria for seven metals that vary as a function of hardness, the lower the hardness, the lower the water quality criteria. The hardness-dependent metal criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. Effluent limitations must be set

using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. The SIP does not address how to determine hardness for application to the equations for the protection of aquatic life when using hardness-dependent metals criteria. It simply states, in Section 1.2, that the criteria shall be properly adjusted for hardness using the hardness of the receiving water. The CTR requires that, for waters with a hardness of 400 mg/L (as $CaCO_3$), or less, the actual ambient hardness of the surface water must be used. It further requires that the hardness values used must be consistent with the design discharge conditions for design flows and mixing zones (See 40 CFR 131.38(c)(4)(i)). The CTR does not define whether the term "ambient", as applied in the regulations, necessarily requires the consideration of the upstream as opposed to downstream hardness conditions.

State Water Board Order No. WQO-2008-0008 (City of Davis) further interpreted the SIP by stating "…*the regional water boards have considerable discretion in the selection of hardness. Regardless of which method is used for determining hardness, the selection must be protective of water quality criteria, given the flow conditions under which a particular hardness exists….Regardless of the hardness used, the resulting limits must always be protective of water quality under all flow conditions.*"

The point in the receiving water affected by the discharge is downstream of the discharge. As the effluent mixes with the receiving water, the hardness of the receiving water can change. Therefore, it is appropriate to use the ambient hardness downstream of the discharge that is a mixture of the effluent and receiving water for the determination of the CTR hardness-dependent metals criteria. A 2006 Study (*Emerick, R.W.; Booroum, Y.; & Pedri, J.E., 2006. California and National Toxics Rule Implementation and Development of Protective Hardness Based Metal Effluent Limitations. WEFTEC, Chicago, Ill.*) demonstrates that using the lowest recorded receiving water hardness for establishing water quality criteria is not always protective of the receiving water under various mixing conditions (e.g., when the effluent hardness is less than the receiving water hardness). The 2006 Study demonstrates that for certain hardness-dependent metals, including copper, any mixture of receiving water that is compliant with water quality objectives for that metal and effluent that is compliant with water quality objectives for that metal, will always result in compliance with water quality objectives. The 2006 Study also demonstrates that it is always protective to determine reasonable potential, and calculate effluent limitations, if needed, based on effluent hardness.

The 2006 study evaluated the relationships between hardness and the CTR metals criterion that is calculated using the CTR metals equation. The equation

describing the total recoverable regulatory criterion, as established in the CTR, is as follows:

CTR Criterion = WER x $e^{m[\ln(H)]+b}$ (Equation 1)

Where:

WER = the discharger-specific water effect ratio
H = Hardness
b = metal- and criterion-specific constant
m = metal- and criterion-specific constant

The constants "m" and "b" are specific to both the metal under consideration, and the type of total recoverable criterion (i.e., acute or chronic). The metal-specific values for these constants are provided in the CTR at paragraph (b)(2), Table 1.

The relationship between hardness and the resulting criterion in Equation 1 can exhibit either a downward –facing (i.e., concave downward) or an upward-facing (i.e., concave upward) curve depending on the values of the criterion-specific constants. The curve shapes for acute and chronic criteria for the metals are as follows:

Concave Downward: cadmium (chronic), chromium (III), copper, nickel, zinc. The finding of the 2006 Study with regard to concave downward metals will be discussed further, since copper is being re-evaluated for reasonable potential.

Concave Upward: cadmium (acute), lead, and silver (acute). The findings of the 2006 Study with regard to concave upward metals will not be discussed at this, as no concave upward metals are being evaluated at this time.

For those contaminants where the regulatory criteria exhibit a concave downward relationship as a function of hardness, use of the lowest recorded effluent hardness for establishment of water quality objectives is fully protective of all beneficial uses regardless of whether the effluent or receiving water hardness is higher. Use of the lowest recorded effluent hardness is also protective under all possible mixing conditions between the effluent and the receiving water (i.e., from high dilution to no dilution).

Because this Order requires compliance with effluent limitations at the end of the discharge pipe, effluent hardness is an appropriate and protective hardness to use in adjusting the water quality criteria for the concave downward metal, copper, which is the subject of this January 27, 2011 Permit modification. The reasonable

worst-case ambient hardness can be estimated by using the lowest effluent hardness. The water quality criteria for copper was calculated for this Order using Equation 1 and a reported minimum effluent hardness of 130 mg/L as $CaCO_3$, based on 13 samples obtained by the Discharger.

Water Effect Ratio (WER) Study
The water quality objective for copper specified in the California Toxics Rule for inland surface waters is in the form of an equation that includes a site-specific WER multiplier factor. The WER reflects any effect that local site water constituents have on increasing or decreasing the bioavailability and toxicity of copper. Application of the WER multiplier, where available, allows for site-specific adjustment of the copper objective. In turn, the copper objective becomes the basis for developing appropriate effluent limitations. In the absence of a site-specific WER multiplier, the CTR uses a default value of one. Order No. R1-2007-0013 established final copper effluent limitations based on the CTR objective assuming a WER multiplier of one, since no site-specific data were available to justify a different multiplier.

The Discharger proposed to conduct a WER study to develop a site-specific copper multiplier for the discharge in accordance with guidance established by USEPA in a document titled Streamlined Water Effect Ratio Procedure for Discharges of Copper (EPA-822-R-01-005). Order No. R1-2007-0013 required the discharger to submit a WER study workplan by May 1, 2008 and to complete the WER study and submit study results by November 1, 2009 for Executive Officer approval.

The Discharger submitted the WER study workplan on April 30, 2008 and the WER study results on October 28, 2009 (report titled *Town of Windsor Wastewater Treatment, Reclamation, and Disposal Facility Copper Water-Effect Ratio Study*). Regional Water Board staff has reviewed the WER study report and has determined that the WER test results were developed in accordance with the methodology in EPA's guidance document.

The WER study resulted in the development of a WER for total recoverable copper in the receiving waters affected by Windsor's discharge of 3.42 and a WER for dissolved copper in the receiving water affected by Windsor's discharge of 3.24. Accordingly, Regional Water Board staff conducted a reasonable potential analysis of Windsor's discharge, utilizing the total recoverable WER of 3.42 (see Fact Sheet section IV.C.3.b.i, below). The WER study results have been used in the reasonable potential analysis (RPA) for copper in section i. below. Based on the results of the RPA, effluent limitations for copper are not necessary..

Reasonable Potential Determination

Table F-8. Summary of Reasonable Potential Analysis for Windsor WWTF

CTR No.	Priority Pollutant	Lowest Applicable Water Quality Criteria(C)	Max Effluent Conc (MEC)	Maximum Detected Receiving Water Conc.(B)	RPA Result-Need Limit?	Reason	Recommendation
6	Copper (H= 130 mg/l)	~~10~~ 39.92	~~15~~ 22	~~3.4~~ 19	No	MEC<C and B<C	Monitoring recommended

Reasonable Potential Analysis: The following section summarizes additional details regarding the data used for the RPA for copper to justify the ~~establishment~~ removal of copper effluent limitations. A discussion of the sampling results for mercury, chlorodibromomethane and dichlorobromomethane are included in this section to justify why effluent limitations and monitoring are not needed for these priority pollutants. A discussion of the sampling results for Bis(2-Ethylhexyl) Pthalate is included to justify the need for additional sampling.

8. Fact Sheet Section IV.C.3.b.i., Rationale for Effluent Limitations and Discharge Specifications, Water Quality-Based Effluent Limitations (WQBELs), Determining the Need for WQBELs, Priority Pollutants, Copper is amended as follows:

   The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. The criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to calculate total recoverable criteria. The USEPA default conversion factors for copper in freshwater are 0.96 for both the acute and the chronic criteria. As discussed in section IV.C.3.b of this Fact Sheet, the applicable WER value for total recoverable copper is 3.42. Using the worst-case measured hardness in the effluent (130 mg/L) to represent zero-dilution conditions (end of pipe compliance), as discussed in section IV.C.3.b of this Fact Sheet, the default conversion factor (0.96) and the constants m = 0.8545 and b = -1.702 from the CTR, the total recoverable copper WER of 3.42, in Equation 1 above, the applicable chronic criterion (maximum 4-day average concentration) is 39.92 ug/L and the applicable acute criterion (maximum 1-hour average concentration is 61.30 ug/L, as total recoverable concentrations

   Effluent monitoring data submitted by the Discharger showed concentrations of total recoverable copper ranging from ~~<9.8~~ <0.7 µg/L to ~~14~~ 22 µg/L in ~~three~~ nineteen samples. ~~Two of the effluent concentrations exceeded the lowest CTR~~

~~criterion of 10 µg/L. Four additional samples were non-detect for copper, but were analyzed using method detection limits that were too high to determine reasonable potential.~~ The MEC for total copper was 22 ug/L, based on 19 samples collected between February 2002 and April 2010. Therefore, analysis of site-specific data and information concludes that the discharge does not have reasonable potential to cause or contribute to an excursion above the CTR criteria for copper.

~~Two~~ Eleven upstream receiving water samples were analyzed for copper. Copper was detected in ~~one~~ eight receiving water samples at ~~a~~ concentrations ~~of 2 u/L~~ ranging from ~~of~~ 0.85 to 19 ug/l. Copper was not detected at a reporting limit of ~~4.3 ug/L the third~~ 4.0 ug/l in three samples. A determination of no reasonable potential based on receiving water is made based on the fact that the receiving water complies with applicable water quality objectives for copper. The water quality objectives for copper in the receiving water based on adjustment for the lowest upstream receiving water hardness (56 ug/L) and the WER (3.42) is 19.44 ug/L.

~~Final effluent limitations for copper are calculated in Attachment E-1. These effluent limitations are based on hardness-based formulas from the CTR published in the Federal Register on May 18, 2000.~~

9. Fact Sheet Section IV.C.4., Rationale for Effluent Limitations and Discharge Specifications, Water Quality-Based Effluent Limitations (WQBELs), WQBEL Calculations is amended to add an introductory paragraph as follows:

   Based on a re-evaluation of reasonable potential for copper, as described in Section IV.C.3.b, above, final WQBELs copper are no longer necessary. The remaining discussion in this section regarding copper is retained for historical purposes only.

10. Fact Sheet Section IV.D.1, Rationale for Effluent Limitations and Discharge Specifications, Final Effluent Limitations, Satisfaction of Anti-Backsliding Requirements is amended to add the following paragraphs to the end of the section as follows:

    This Order is consistent with antibacksliding requirements set forth in 40 CFR section 122.44. Effluent limitations for copper have been removed from the permit based upon site-specific conditions at the Discharger's facility. The new information provided by the Discharger indicates that based upon the relative bioavailability of copper to aquatic organisms; there is no reasonable potential for toxicity to those organisms from copper at concentrations detected in the effluent.

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Therefore, the protection afforded under the modified permit results in a level of protection for beneficial uses equal to the previous conditions of Order No. R1-2007-0013. Additionally, this Order is consistent with section 303 (d)(4)(B) of the Clean Water Act, which allows for changes to effluent limitations or other permitting standards provided that the quality of receiving waters equals or exceeds levels necessary to protect the beneficial uses for such waters and the change is consistent with the antidegradation policy. Consistency with the antidegradation policy is addressed below based on the conclusions of the Discharger's WER study, is at least as stringent as the effluent limitations in the Permit adopted by the Regional Water Board on June 14, 2007. Effluent limitations for copper have been modified based on site-specific conditions at the Discharger's facility. The new information provided by the Discharger indicates that based upon the relative bioavailability of copper to aquatic organisms, the higher numeric concentrations established as final effluent limitations in this Order provide an equal level of protection of beneficial uses as the final effluent limitations for copper previously established in this Order. Therefore, this Order is consistent with antibacksliding requirements pursuant to 40 CFR section 122.44. Additionally, this Order is consistent with section 303(d)(4)(B) of the Clean Water Act, which allows for changes to effluent limitations or other permitting standards provided that the quality of receiving waters equals or exceeds levels necessary to protect the beneficial uses for such waters and the change is consistent with the antidegradation policy. Consistency with the antidegradation policy is addressed below.

11. Fact Sheet Section IV.D.2. Rationale for Effluent Limitations and Discharge Specifications, Final Effluent Limitations, Satisfaction of Antidegradation Policy is amended to add the following paragraphs to the end of the section as follows:

Pursuant to the antidegradation policy, the lowering of water quality can be allowed only if beneficial uses are protected, and if there is a maximum benefit to the people of the state. While the removal of the effluent limits may result in a slight increase in the amount of copper discharged to the water body when compared with the amount that would be discharged in compliance with the existing effluent limitations, the removal of effluent limitations is predicated on a finding that there is no reasonable potential for toxicity to organisms from copper in the effluent. Accordingly, this action will result in no less protection of beneficial uses and will maintain water quality. In addition, the Discharger has evaluated potential sources in an effort to further reduce copper concentrations in the effluent.

Furthermore, discharges regulated in accordance with this Order are for a publicly owned treatment works (POTW). The significant increase in costs for

additional treatment that would be required to remove low levels of copper are not in the best interest of the public given that beneficial uses are already shown to be protected and because any resources available for water quality improvements should be used for nonattainment waters or other pressing water quality issues as opposed to treating effluent beyond what is required for protecting beneficial uses.

The activities allowed in accordance with these modifications to the waste discharge requirements apply to existing facilities. Discharges from the WWTF will be required to maintain protection of the beneficial uses of the receiving water and comply with applicable provisions of the Basin Plan.

B. Modifications to Include Geysers Project Discharge and Increase Permitted Capacity

1. Finding II.B of the Order is amended as follows:

   The Discharger owns and operates a municipal WWTF and associated collection, reclamation and disposal facilities that serve a population of approximately 26,500 residential, commercial and industrial users. The treatment system consists of biological secondary treatment utilizing extended air activated sludge aeration basins and secondary clarifiers; advanced wastewater treatment (AWT) that includes chemical addition facilities, flocculation tanks, AWT clarifiers, and sand filters; ultraviolet disinfection; chlorine disinfection of recycled water delivered to Windsor High School; and storage prior to reclamation, discharge to the Geysers recharge pipeline, and/or surface water disposal. Wastewater is discharged from Discharge Point 002 to Mark West Creek, a water of the United States, and a tributary to the Russian River within the Middle Reach of the Russian River. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

2. Discharge Prohibition III.H of the Order is amended as follows:

   Prior to completion of the connection and and initiation of use of the Geysers Project, the ADWF of waste into the Discharger's Facility in excess of 1.6 mgd, as determined from the lowest consecutive 30-day mean daily flow, is prohibited, and after completion of the connection and initiation of use of the Geysers Project, the ADWF of waste into the Discharger's Facility in excess of 1.9 mgd is prohibited, unless the Discharger demonstrates that it has storage and reclamation capacity to handle a higher ADWF, not to exceed 2.25 mgd.

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3. Reclamation Specification IV.C.4 of the Order is amended as follows:

   Reclamation Capacity. Prior to completion of the connection and initiation of use of the Geysers Project, ~~T~~the Discharger shall maintain, at a minimum, a storage capacity of 163 million gallons and irrigation area of 463 equivalent acres, for the current average dry weather flow of 1.6 mgd. Upon completion of the connection and initiation of use of the Geysers Project, the Discharger shall maintain, at a minimum, a storage capacity of 149 million gallons and irrigation area of 393 equivalent acres. Additionally, the Discharger shall demonstrate that it has increased its total storage capacity and associated irrigation areas in accordance with Tables 9, 9a, or 9b in order to gain authorization to increase its average dry weather flow (up to the WWTF capacity of 2.25 mgd).

4. Reclamation Specification IV.C.4 is amended to add the following tables and associated notes:

Table 9a. Projected Storage and Irrigation Capacities for Treatment Capacity Increases with 0.53 MGD Diversion to Geysers Project

Treatment & Reclamation System Rated ADWF Capacity (mgd)	Minimum Total Storage Capacity (mg)	Minimum Total Irrigation Area (equivalent acres)
1.6	149	393
1.7	149	393
1.8	149	393
1.9	149	393
2.0	165	418
2.1	165	543
2.2	196	543
2.25	207	583

Table 9b. Projected Storage and Irrigation Capacities for Treatment Capacity Increases with 0.75 MGD Diversion to Geysers Project

Treatment & Reclamation System Rated ADWF Capacity (mgd)	Minimum Total Storage Capacity (mg)	Minimum Total Irrigation Area (equivalent acres)
1.6	149	393
1.7	149	393
1.8	149	393
1.9	149	393

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Treatment & Reclamation System Rated ADWF Capacity (mgd)	Minimum Total Storage Capacity (mg)	Minimum Total Irrigation Area (equivalent acres)
2.0	149	393
2.1	149	393
2.2	149	523
2.25	165	438

Notes for Tables 9a and 9b:

1 – Dead storage was assumed to be 10% of total storage for all flow conditions. All scenarios provide 20 days of storage reliability under dry-weather conditions.

2 – Total storage does not include County storage facilities, totaling 50 MG, that are available to the Town for the next four years (through 2014).

3 – Total irrigation area represents the minimum acreage required to maintain at least 20 days of storage reliability during dry-weather conditions. The reduction in acreage from existing conditions was assumed to be in private acreage deliveries. It was assumed that the Discharger would maintain the same buffer/irrigation lands as current conditions.

5. Attachment E – Monitoring and Reporting Program (September 20, 2007 Revision) Section II, Monitoring Locations, Table E-1, Summary of Discharge Points and Monitoring Station Locations is modified to add the new Geysers Project discharge as follows:

Table E-1. Summary of Discharge Points and Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description (include Latitude and Longitude when available)
004	EFF-001	Treated, UV disinfected effluent delivered to the Geysers recharge pipeline

6. Fact Sheet Section II.A., Facility Description, Description of Collection System and Wastewater and Biosolids Treatment and Controls is amended as follows:

Wastewater Treatment

The current Facility provides advanced wastewater treatment and has design capacities of 2.25 mgd, average dry weather flow (ADWF) and 7.2 mgd, peak weekly wet weather flow. The wastewater treatment facilities include biological secondary treatment utilizing extended air activated sludge aeration basins and secondary clarifiers; advanced wastewater treatment (AWT) that includes chemical addition facilities, flocculation tanks, AWT clarifiers, and sand filters; ultraviolet (UV) disinfection; and storage prior to reclamation, discharge to the Geysers recharge pipeline, and/or disposal. A portion of the treated and UV

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disinfected effluent is directed to a wet well for chlorination prior to being transferred to Windsor High School for toilet flushing and landscape irrigation. Attachment C provides a flow schematic of the Facility.

7. Fact Sheet Section II.E, Planned Changes is amended to include the following paragraphs at the end of the section as follows:

   On November 5, 2008, the Town formally decided to move forward with the Geysers Recharge Pipeline Connection Project (Geysers), by letter to the Regional Water Board Executive Officer dated February 11, 2009. The project consists of initially delivering an annual average flow of 0.53 mgd of recycled water to the Geysers (0.70 mgd in October through May and 0.20 mgd in June through September). Based on the terms of the agreement, the Town has the ability to increase deliveries to a maximum annual average flow of 0.75 mgd (0.92 mgd in October through May and 0.42 mgd in June through September). On July 21, 2010, the Discharger submitted a ROWD with a technical memorandum that includes a water balance to model the Discharger's existing treatment, discharge, and storage system to demonstrate the reliability of the Discharger's current storage, disposal and reclamation system and to identify the additional reliability that would be provided by the Discharger's connection to the Geysers pipeline. The water balance model demonstrates that, with the Geysers Project, the WWTF can effectively treat and reuse/dispose higher influent flows and improve the storage reliability that the Discharger currently has. The Discharger has initiated construction of its pump station and pipeline connection to Geysers pipeline and anticipates to complete construction and begin diverting its disinfected, treated effluent to the pipeline by July 2011.

8. Fact Sheet Section IV.A.8 is amended as follows:

   Prior to completion of the connection and initiation of use of the Geysers Project, the ADWF of waste into the Discharger's Facility in excess of 1.6 mgd, as determined from the lowest consecutive 30-day mean daily flow, is prohibited, and after completion of the connection and initiation of use of the Geysers Project, the ADWF of waste into the Discharger's Facility in excess of 1.9 mgd is prohibited, unless the Discharger demonstrates that it has storage and reclamation capacity to handle a higher ADWF, not to exceed 2.25 mgd.

   The design capacity of the WWTF is 2.25 mgd. Currently, the Discharger's reclamation capacity is 1.6 mgd, based on the capacity of the existing storage ponds and irrigation system. Discharge Prohibition III.H allows an increase in the Discharger's treatment and reclamation capacity upon completion of the

connection and initiation of use of the Geysers Project. The Discharger is actively pursuing other alternatives to increase reclamation capacity. The Discharger must demonstrate to the Executive Officer that it has increased its storage and irrigation capacity, in order to receive approval for increased flows into the WWTF.

9. Fact Sheet Section IV.G.3 is amended as follows:

   Reclamation Capacity. This Order requires that the Discharger maintain minimum storage and irrigation area capacities that are required to maintain the Discharger's water balance for reclamation and disposal. Tables 9 and 9a of the Order, Projected Storage and Irrigation Capacities for Reclamation System Capacity Increases, was generated by ~~a~~ models developed by the Discharger's technical consultant and subsequently provided for inclusion in this Order. Discharge Prohibition III.H of the Order limits the Discharger to an ADWF of 1.6 mgd, and allows an increase in ADWF of 1.9 mgd upon completion of the connection and initiation of use of the Geysers Project at an average annual flow rate of 0.53 mgd. ~~unless t~~The Discharger must provide~~s~~ documentation that it has increased its total storage capacity and associated irrigation area capacity in accordance with Tables 9, 9a, or 9b in the Order. This Provision is retained from the Order No. R1-2002-0013.

C. Other Modifications

1. Modifiy Fact Sheet Section VIII.A, Public Participation, Notification of Interested Parties to add the following paragraph at the end of the section:

   The Discharger and interested agencies and persons have been notified of the Regional Water Board's intent to modify waste discharge requirements for the existing discharge and have been provided opportunities for public meetings and to submit their written views and recommendations. Notification was provided through posting on the Regional Water Board's Internet site at: http://www.waterboards.ca.gov/northcoast/public_notices/public_hearings/npdes_permits_and_wdrs.shtml and through publication in the Press Democrat on November 15, 2010. On January 27, 2011, after due notice to the Discharger and all other affected persons, the Regional Water Board conducted a public hearing and evidence was received regarding adoption of Order No. R1-2011-0006 modifying Order No. R1-2007-0013.

2. Modify Fact Sheet Section VIII.B, Public Participation, Written Comments to add the following paragraph at the end of the section:

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To be fully responded to by staff and considered by the Regional Water Board, written comments on modifications to Order No. R1-2007-0013 contained in Order No. R1-2011-0006 should be received at the Regional Water Board offices by 5:00 p.m. on December 15, 2010.

Certification:

I, Catherine Kuhlman, 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, North Coast Region, on January 27, 2011.

_____

Catherine Kuhlman
Executive Officer

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