ATTACHMENT E – MONITORING AND REPORTING PROGRAM NO. R1-2010-0034 (REVISED SEPTEMBER 2, 2014)

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP) (REVISED SEPTEMBER 2, 2014)

The Code of Federal Regulations (CFR) at 40 CFR 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Wastewater Monitoring Provision. Composite samples may be taken by a proportional sampling device approved by the Executive Officer or by grab samples composited in proportion to flow. In compositing grab samples, the sampling interval shall not exceed one hour.

B. If the Discharger monitors any pollutant more frequently than required by this Order, using test procedures approved by 40 CFR Part 136 or as specified in this Order, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the monthly and annual discharger monitoring reports.

C. Laboratories analyzing monitoring samples shall be certified by the California Department of Public Health (CDPH) in accordance with the provisions of Water Code section 13176, and must include quality assurance / quality control data with their analytical reports.

D. Compliance and reasonable potential monitoring analyses shall be conducted using commercially available and reasonably achievable detection limits that are lower than the applicable effluent limitation. If no ML value is below the effluent limitation, the lowest ML shall be selected as the RL. Table E-1 lists the test methods the Discharger may use for compliance and reasonable potential monitoring to analyze priority pollutants with effluent limitations.

Table E-1. Test Methods and Minimum Levels for Priority Pollutants

CTR No.	Constituent Types of Analytical Methods Minimum Levels (µg/L)	Types of Analytical Methods Minimum Levels (µg/L)	
		Inductively Coupled Plasma/ Mass Spectroscopy(ICPMS)	Stabilized Platform Graphite Furnace Atomic Absorption
6	Copper	0.5	2

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-2. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	INF-001	Untreated influent wastewater collected at the plant headworks at a representative point preceding primary treatment.
--	INT-001	Internal monitoring location for the purpose of monitoring treated wastewater immediately following the advanced wastewater (AWT) process to demonstrate compliance reclamation specifications for turbidity
--	INT-002	Internal monitoring location for the purpose of monitoring disinfected tertiary recycled water to demonstrate compliance with UV reclamation specifications.
001	EFF-001[1]	Treated wastewater after disinfection but prior to discharge to Basalt Pond.
002	REC-001[1]	Treated wastewater after disinfection but prior to discharge to 25 MG recycled water storage pond.
003	REC-002	Location where a representative sample of treated wastewater, to be reclaimed at all approved reclamation sites, can be collected, following all treatment and storage in 25 MG recycled water storage pond and immediately before its application for irrigation.
--	RSW-001	Downstream receiving water monitoring location. Samples shall be representative of conditions in Basalt Pond following introduction and mixing of effluent from the Facility. Samples shall be collected from a representative location on the western side of the Basalt Pond, approximately 25 to 50 feet from the discharge outfall and the shore, or at another location approved by the Regional Water Board Executive Officer. If the Discharger wants to monitor receiving water at an alternate location, a written proposal justifying the change must be submitted to the Regional Water Board Executive Officer for review and approval.
--	RSW-002	Russian River at USGS Gauge No. 11-4640
	RSW-003	Dry Creek at USGS Gauge No. 11-4653.50

[1] Monitoring locations EFF-001 and REC-001 are the same location, the sampling point at the effluent end of the UV disinfection system. Different Discharge Point Names and Monitoring Location Names have been assigned due to differences in monitoring requirements at Discharge Points 001 (discharge to Basalt Pond) and 002 (discharge to reclamation system).

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

The Discharger shall monitor influent to the Facility at Monitoring Location INF-001 as follows:

Table E-3. Influent Monitoring – Monitoring Location INF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	24-hr composite	Weekly[2]	Standard Methods[3]
Total Suspended Solids	mg/L	24-hr composite	Weekly[2]	Standard Methods
Influent Flow[4]	mgd	Meter	Continuous	Meter

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

The Discharger shall monitor treated wastewater to be discharged to Basalt Pond prior to contact with receiving water at Monitoring Location EFF-001 as follows:

Table E-4. Effluent Monitoring for Discharges to Basalt Pond – Monitoring Location EFF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Effluent Flow[5,6]	mgd	Meter	Continuous	Meter
Dilution Rate	% of stream flow	Calculation	Daily	--
Biochemical Oxygen Demand (5-day @20°C)	mg/L	24-hr composite	Weekly[2]	Standard Methods[3]

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[2] Monitoring of BOD_5 and TSS in the influent shall coincide with monitoring of these parameters in the effluent (e.g., same day and approximately the same time).

[3] In accordance with the current edition of Standard Methods for Examination of Water and Wastewater (American Public Health Administration) or current test procedures specified in 40 CFR Part 136.

[4] Each month, the Discharger shall report maximum daily and average daily flow rate, and average monthly flows.

[5] Each month, the Discharger shall report average daily and average monthly flows.

[6] Effluent flow is measured at a point that is downstream of the membrane filters and upstream of the UV disinfection system.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Suspended Solids	mg/L	24-hr composite	Weekly[2]	Standard Methods[3]
Total Coliform Bacteria	MPN/100 mL	Grab	Weekly	Standard Methods[3]
Dissolved Oxygen	mg/L	Grab	Weekly	Standard Methods[3]
pH	standard units	Grab	Weekly	Standard Methods[3]
Temperature	°F or °C	Grab	Weekly	Standard Methods[3]
Hardness, Total (as $CaCO_3$)[7, 8]	mg/L	Grab	Monthly	Standard Methods[3]
Copper, Total Recoverable[7,8,9]	µg/L	Grab	Monthly	EPA Method 200
Acute Toxicity[10]	% Survival	24-hour composite	Quarterly	See Section V.A below
Chronic Toxicity[11]	TUc	24-hour composite	Annually	See Section V.B below
CTR Pollutants[9,11]	µg/L	24-hour composite[12]	3X/5 years	Standard Methods[3]
Title 22 Pollutants [13]	µg/L	24-hour composite[12]	1X/5 years	Standard Methods[3]
Nitrate Nitrogen, Total (as N)	mg/L	Grab	Monthly	Standard Methods[3]
Ammonia Nitrogen, Total (as N)[14]	mg/L	Grab	Monthly	Standard Methods[3]

[7] Effluent and receiving water hardness samples shall be collected on the same day and at approximately the same time as effluent samples for copper.

[8] Monitoring for hardness shall be conducted concurrently with effluent sampling for copper.

[9] Analytical methods shall achieve the lowest minimum level (ML) specified in Appendix 4 of the SIP; and in accordance with Section 2.4.1 of the SIP, the Discharger shall report the Reporting Level (RL) and the Method Detection Limit (MDL) with each sample result.

[10] Whole effluent acute and chronic toxicity shall be monitored in accordance with the requirements of section V of this Monitoring and Reporting Program.

[11] CTR pollutants are those pollutants identified in the California Toxics Rule at 40 CFR 131.38.

[12] CTR and Title 22 pollutant samples shall be collected using 24-hour composite sampling, except for pollutants that are volatile.

[13] The Title 22 pollutants are those pollutants for which the Department of Public Health has established Maximum Contaminant Levels (MCLs) at Title 22, Division 4, Chapter 15, sections 64431 (Inorganic Chemicals) and 64444 (Organic Chemicals) of the California Code of Regulations. Duplicate analyses are not required for pollutants that are identified both as CTR and Title 22 pollutants.

[14] Monitoring for ammonia shall be concurrent with acute whole effluent toxicity monitoring (Section V.A.1 of this MRP). Effluent and receiving water temperature and pH shall be recorded at the time of the ammonia sample.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Ammonia Nitrogen, Unionized (as N)	mg/L	--	Monthly	Calculation
Phosphorus, Total (as P)	mg/L	Grab	Monthly	Standard Methods[3]

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Acute Toxicity Testing

The Discharger shall conduct acute whole effluent toxicity testing (WET) to determine compliance with the effluent limitation for acute toxicity established by section IV.A.1 of the Order.

1. **Test Frequency.** The Discharger shall conduct acute WET testing in accordance with the schedule established by this MRP while discharging at Discharge Point 001, as summarized in Table E-4, above.

2. **Sample Type.** For 96-hour static renewal or 96-hour static non-renewal testing, the effluent samples shall be 24-hour composite samples collected at Monitoring Location EFF-001.

3. **Test Species.** The Discharger shall conduct two suites of acute WET testing using an intertebrate, the water flea, *Ceriodaphnia dubia*, and a vertebrate, rainbow trout, *Oncorhynchus mykiss*. After the initial screening period, monitoring shall be conducted using the most sensitive species. If the sensitivity of both species is equal, WET testing shall be conducted using the rainbow trout, *Oncorhynchus mykiss* for the remaining term of this Order. **The next two-species acute WET test shall be conducted by March 2014.**

4. **Test Methods.** The presence of acute toxicity shall be estimated as specified in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (USEPA Report No. EPA-821-R-02-012, 5th edition or subsequent editions), or other methods approved by the Executive Officer.

   Test procedures related to pH control, sample filtration, aeration, temperature control and sample dechlorination shall be performed in accordance with the USEPA method and fully explained and justified in each acute toxicity report submitted to the Regional Water Board. The control of pH in acute toxicity tests is allowed, provided the test pH is maintained at the effluent pH measured at the time of sample collection, and the control of pH is done in a manner that has the least influence on the test water chemistry and on the toxicity of other pH sensitive materials such as some heavy metals, sulfide and cyanide.

5. **Test Dilutions.** The acute toxicity test shall be conducted using 100 percent effluent collected at Monitoring Location EFF-001.

6. **Test Failure.** If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger shall re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.

7. **Accelerated Monitoring.** If the result of any acute toxicity test fails to meet the single test minimum limitation (70 percent survival), and the testing meets all test acceptability criteria, the Discharger shall take two more samples, one within 14 days and one within 21 days following receipt of the initial sample result. If any one of the additional samples do not comply with the three sample median minimum limitation (90 percent survival), the Discharger shall initiate a Toxicity Reduction Evaluation (TRE) in accordance with section VI.C.2.a of the Order. If the two additional samples are in compliance with the acute toxicity requirement and testing meets all test acceptability criteria, then a TRE will not be required. If the discharge stops before additional samples can be collected, the Discharger shall contact the Executive Officer within 21 days with a plan to demonstrate compliance with the effluent limitation.

8. **Notification.** The Discharger shall notify the Regional Water Board in writing 14 days after the receipt of test results exceeding the acute toxicity effluent limitation. The notification will describe actions the Discharger has taken or will take to investigate and correct the cause(s) of toxicity. It may also include a status report on any actions required by this Order, with a schedule for actions not yet completed. If no actions have been taken, the reasons shall be given.

9. **Reporting.** Test results for acute toxicity tests shall be reported according to section 12 (Report Preparation) of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms or in an equivalent format that clearly demonstrates that the Discharger is in compliance with effluent limitations, and other permit requirements.

B. Chronic Toxicity Testing

The Discharger shall conduct chronic toxicity testing to demonstrate compliance with the Basin Plan's water quality objective for toxicity. The Discharger shall meet the following chronic toxicity testing requirements:

1. **Test Frequency.** The Discharger shall conduct annual chronic WET testing in accordance with the schedule established by this MRP while discharging at Discharge Point 001, as summarized in Table E-4, above.

2. **Sample Type.** Effluent samples from Monitoring Location EFF-001 shall be 24-hour composite samples. For toxicity tests requiring renewals, a minimum of three 24-hour composite samples shall be collected. The lapsed time (holding time) from sample collection to first use of each sample must not exceed 36 hours.

3. **Test Species.** Test species for chronic WET testing shall be shall be a vertebrate, the fathead minnow, *Pimephales promelas* (larval survival and growth), an invertebrate, the water flea, *Ceriodaphnia dubia* (survival and reproduction test), and a plant, the green algae, *Selanastrum capricornutum* (growth test). At least one time every 5 years, the Discharger shall conduct two suites of chronic WET testing using the three species listed above. After this screening period, monitoring shall be conducted annually using the most sensitive species. **The next multiple species chronic WET test shall be conducted by March 2014.**

4. **Test Methods.** The presence of chronic toxicity shall be estimated as specified in USEPA's *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms* (USEPA Report No. EPA-821-R-02-013, or subsequent editions).

   Test procedures related to pH control, sample filtration, aeration, temperature control and sample dechlorination shall be performed in accordance with the USEPA method and fully explained and justified in each acute toxicity report submitted to the Regional Water Board. The control of pH in chronic toxicity tests is allowed, provided the test pH is maintained at the pH of the receiving water measured at the time of sample collection, and the control of pH is done in a manner that has the least influence on the test water chemistry and on the toxicity of other pH sensitive materials such as some heavy metals, sulfide and cyanide.

5. **Test Dilutions.** The chronic toxicity test shall be conducted using a series of at least five dilutions and a control. The series shall consist of the following dilution series: 12.5, 25, 50, 75, and 100 percent, and a control. Control and dilution water shall be receiving water collected at an appropriate location upstream of the discharge point. Laboratory water may be substituted for receiving water, as described in the USEPA test methods manual, upon approval by the Executive Officer. If the dilution water used is different from the culture water, a second control using culture water shall be used.

6. **Reference Toxicant.** If organisms are not cultured in-house, concurrent testing with a reference toxicant shall be conducted. Where organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests also shall be conducted using the same test conditions as the effluent toxicity tests (e.g., same test duration, etc.).

7. **Test Failure.** If either the reference toxicant test or the chronic toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger shall re-sample and re-test as soon as possible, not to exceed 14 days following notification of test failure.

8. **Notification.** The Discharger shall notify the Regional Water Board in writing within 14 days after the receipt of test results that indicate an exceedance of the monitoring trigger for chronic toxicity during regular or accelerated monitoring.

9. **Accelerated Monitoring Requirements.** If the result of any chronic toxicity test exceeds the chronic toxicity monitoring trigger of 1.0 TUc as specified in section VI.C.2.a. of the Order, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring. Accelerated monitoring shall consist of four additional effluent samples and dilution series (specified in number 5 above) – with one test for each test species that showed toxicity results exceeding the toxicity trigger. Accelerated monitoring tests shall be conducted approximately every week over a 4 week period.

   Testing shall commence within 14 days of receipt of initial sample results which indicated an exceedance of the chronic toxicity trigger. If the discharge will cease before the additional samples can be collected, the Discharger shall contact the Executive Officer within 21 days with a plan to address elevated levels of chronic toxicity in effluent and/or receiving water. The following protocol shall be used for accelerated monitoring and TRE implementation:

   a. If the results of four consecutive accelerated monitoring tests do not exceed the chronic toxicity trigger of 1.0 TUc, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring. However, if there is adequate evidence of a pattern of effluent toxicity, the Regional Water Board's Executive Officer may require that the Discharger initiate a TRE.

   b. If the source(s) of the toxicity is easily identified (i.e. temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring "trigger." Upon confirmation that the chronic toxicity has been removed, the Discharger

may cease accelerated monitoring and resume regular chronic toxicity monitoring.

c. If the result of any accelerated toxicity test exceeds an effluent limitation or monitoring trigger, the Discharger shall cease accelerated monitoring and, within thirty (30) days of the date of completion of the accelerated monitoring test, initiate the TRE Workplan developed in accordance with Section VI.C.2.a.(2) of the Order to investigate the cause(s) and identify corrective actions to reduce or eliminate the chronic toxicity. Within thirty (30) days of completing the TRE Workplan implementation, the Discharger shall submit a report to the Regional Water Board including, at a minimum:

   i. Specific actions the Discharger took to investigate and identify the cause(s) of toxicity, including a TRE WET monitoring schedule;

   ii. Specific actions the Discharger took to mitigate the impact of the discharge and prevent the recurrence of toxicity;

   iii. Recommendations for further actions to mitigate continued toxicity, if needed; and

   iv. A schedule for implementation of recommended actions.

C. Chronic Toxicity Reporting

1. **Routine Reporting.** All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals and this Monitoring and Reporting Program. Chronic toxicity test results shall be submitted with the self-monitoring report.

   The WET test report shall contain a narrative report that includes details about WET test procedures and results, including the following:

   a. receipt and handling of the effluent sample that includes a tabular summary of initial water quality characteristics;

   b. the source and make-up of the lab control/diluent water used for the test;

   c. any manipulations done to lab control/diluent and effluent such as filtration, nutrient addition, etc.;

   d. identification of any reference toxicant testing performed;

   e. tabular summary of test results for control water and each effluent dilution and statistics summary to include calculation of NOEC, TU_c and IC_{25};

f. identification of any anomalies or nuances in the test procedures or results;

g. Summary and Conclusions section.

Test results shall include, at a minimum, for each test:

a. sample date(s)
b. test initiation date
c. test species
d. end point values for each dilution (e.g., number of young, growth rate, percent survival)
e. NOEC value(s) in percent effluent
f. IC15, IC25, IC40, and IC50 values (or EC15, EC25…etc.) in percent effluent
g. TUc values (100/NOEC)
h. Mean percent mortality (±s.d.) after 96 hours in 100 percent effluent (if applicable)
i. NOEC and LOEC values for reference toxicant test(s)
j. IC50 or EC50 value(s) for reference toxicant test(s)
k. Available water quality measurements for each test (e.g., pH, DO, temperature, conductivity, hardness, salinity, ammonia)
l. Statistical methods used to calculate endpoints.
m. The statistical output page, which includes the calculation of percent minimum significant difference (PMSD).
n. Results of applicable reference toxicant data with the statistical output page identifying the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD and dates tested; the reference toxicant control charts for each endpoint, to include summaries of reference toxicant tests performed by the contracting laboratory; and any information on deviations from standard test procedures or problems encountered in completing the test and how the problems were resolved.

2. **Quality Assurance Reporting.** Because the permit requires sublethal hypothesis testing endpoints from methods 1000.0, 1002.0, and 1003.0 in the test methods manual titled *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA-821-R-02-013, 2002), with-in test variability must be reviewed for acceptability and variability criteria (upper and lower PMSD bounds) must be applied, as directed under section 10.2.8 – *Test Variability* of the test methods manual.

Under section 10.2.8, the calculated PMSD for both reference toxicant test and effluent toxicity test results must be compared with the upper and lower PMSD bounds variability criteria specified in Table 6 – *Variability Criteria (Upper and Lower PMSD Bounds) for Sublethal Hypothesis Testing Endpoints Submitted Under NPDES Permits*, following the review criteria in paragraphs 10.2.8.2.1 through 10.2.8.2.5 of the test methods manual. Based on this review, only accepted effluent toxicity test results shall be reported.

3. **Compliance Summary.** Each monthly self-monitoring report shall contain an updated chronology of chronic toxicity test results expressed in TUc, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency (routine, accelerated, or TRE). The annual report shall clearly demonstrate that the Discharger is in compliance with effluent limitations and other permit requirements.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

This section is not applicable to the Discharger as treated wastewater is not discharged to or applied to land for the purpose of disposal. The Discharger reclaims treated wastewater thus the Discharger has Reclamation Monitoring Requirements rather than Land Discharge Monitoring Requirements.

VII. RECLAMATION MONITORING REQUIREMENTS

The following reclamation requirements are applicable during periods when the reclamation system is being used. No monitoring is required during periods when all effluent is discharged to Basalt Pond.

A. Recycled Water Monitoring

1. The Discharger shall monitor treated, disinfected wastewater that will be reclaimed prior to discharge to the 25 million gallon recycled water storage pond at Monitoring Location **REC-001** as follows:

Table E-5. Reclamation Monitoring Requirements – REC-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow[15]	mgd	Meter	Continuous	Meter
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	Grab	Weekly	Standard Methods[3]
Total Suspended Solids	mg/L	Grab	Weekly	Standard Methods[3]

[15] Each month, the Discharger shall report the average and maximum daily flow rate discharged to the recycled water storage pond.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Coliform Bacteria	MPN/100 mL	Grab	Daily	Standard Methods[3]
pH	standard units	Grab	Weekly	Standard Methods[3]
Visual Observations[16]	--	--	Daily	Visual

2. The Discharger shall monitor treated wastewater prior to reclamation at Monitoring Location **REC-002** as follows:

Table E-6. Reclamation Monitoring Requirements – REC-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow[17]	mgd	Meter	Continuous	Meter
Ammonia Nitrogen[18]	mg/L	Grab	Monthly	Standard Methods[3]
Nitrate Nitrogen[18]	mg/L	Grab	Monthly	Standard Methods[3]
Nitrite Nitrogen[18]	mg/L	Grab	Monthly	Standard Methods[3]
Organic Nitrogen[22]	mg/L	Grab	Monthly	Standard Methods[3]
TDS	mg/L	Grab	Monthly[19]	Standard Methods[3]
Chloride	mg/L	Grab	Monthly[19]	Standard Methods[3]
Boron	mg/L	Grab	Monthly[19]	Standard Methods[3]
Sodium	mg/L	Grab	Monthly[19]	Standard Methods[3]
Title 22 Pollutants	mg/L	Grab	1X/5 years[20]	Standard Methods[3]

B. Recycled Water Production and Use.

Recycled water quality characteristics and precipitation data shall be used to ascertain nitrogen loading rates at each recycled water use site. The following information shall be reported for each use site:

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[16] Visual observations shall be conducted during and immediately after any discharge to the irrigation system, and shall include a record of any odors, evidence of surface run-off, or other signs of malfunction or improper operation. The monthly monitoring report shall include the daily volume of treated wastewater discharged to the irrigation system and any observations indicating non-compliance with the provisions of the waste discharge requirements.

[17] Each month, the Discharger shall report the volume of recycled water delivered to each recycled water use site. In addition, the Discharger shall report the number of days that treated wastewater was used for reclamation at authorized reclamation sites,

[18] Monitoring for ammonia, nitrate, nitrite and organic nitrogen is for the purpose of determining total nitrogen concentration for agronomic rate calculations.

[19] The monitoring frequency for TDS, chloride, boron, and sodium may be reduced or eliminated if monitoring data demonstrates that any of these constituents are consistently present at concentrations that do not pose a threat to groundwater or surface water quality.

[20] Sample to be collected between June and September during first year of reclamation.

Table E-7. Recycled Water Production and Use

Parameter	Units	Sample Type	Minimum Sampling Frequency
Volume of recycled water[21]	Acre-feet	Meter	Monthly
Total area of application	Acres	Observation	Monthly
Total Nitrogen (as N) application rate[22,23]	Lbs N/acre-month	Calculation	Monthly
Rainfall[24]	Inches	Gage	Daily

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Surface Water

1. The Discharger shall monitor downstream conditions in Basalt Pond at Monitoring Location RSW-001 during periods of discharge to Basalt Pond as follows:

Table E-8. Receiving Water Monitoring Requirements – Monitoring Location RSW-001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	cfs or mgd	Meter	Daily	---
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	Grab	Monthly	Standard Methods[3]
Turbidity	NTU	Grab	Monthly	Standard Methods
Hardness, Total (as $CaCO_3$)[25]	mg/L	Grab	Monthly[7]	Standard Methods
Nitrate Nitrogen, Total (as N)	mg/L	Grab	Monthly	Standard Methods[3]
Phosphorus, Total (as P)	mg/L	Grab	Monthly	Standard Methods[3]

[21] Estimation of the volume of recycled water shall not include other potable or non-potable "make-up" water used in conjunction with recycled water.

[22] Nitrogen application rate shall consider nitrogen content of the recycled water, based on analytical data obtained by the Discharge.

[23] Nitrogen concentrations shall be calculated and reported "as N". For example, nitrate-nitrogen= 27 mg/L as NO_3 shall be converted and reported as nitrate-nitrogen = 6.1 mg/L as N using a conversion factor of 14.0067 (N)/62.0049 (NO_3)

[24] Rainfall monitoring at the wastewater treatment plant is acceptable.

[25] Effluent and receiving water hardness samples shall be collected on the same day and at approximately the same time as effluent samples for copper and hardness.

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Title 22 Pollutants	mg/L	Grab	1X/5 years (concurrent with effluent monitoring)	Standard Methods[3]

2. **Flow Monitoring.** The Discharger shall monitor flow on a daily basis in the Russian River at Monitoring Location RSW-002 and in Dry Creek at Monitoring Location RSW-003 for the purpose of calculating dilution rate at Monitoring Location EFF-001 (Table E-4). The flow rate shall be determined using the sum of the flows at USGS Gauge No. 11-4640.00 in the Russian River near Healdsburg and USGS Gauge No. 11-4653.50 in Dry Creek near its mouth. Flow shall be reported as million gallons per day (mgd) or cubic feet per second (cfs).

B. Groundwater.

There are no groundwater monitoring requirements in this monitoring and reporting program. Groundwater monitoring may be established in the future if necessary to assess impacts of effluent discharge to the reclamation system.

IX. OTHER MONITORING REQUIREMENTS

A. Filtration Process Monitoring

1. **Effluent Filter Monitoring (Monitoring Location INT-001)**

   a. **Monitoring.** The turbidity of the filtered effluent shall be continuously measured and recorded. Should the turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2 hours may be substituted for a period of up to 24 hours. The recorded data shall be maintained by the Discharger for at least 3 years. The daily average and daily maximum turbidity results shall be reported on the monthly monitoring reports.

   b. **Compliance.** Compliance with the daily average effluent turbidity limitation specified in the California Code of Regulations Water Recycling Criteria (title 22), as referenced in section IV.D.1.a of the Order, shall be determined by averaging all turbidity readings collected in a calendar day. Compliance shall be determined using the levels of recorded turbidity taken at intervals of no more than 1.2 hours over a 24-hour period.

   c. **Reporting.** If the filtered effluent turbidity exceeds 0.2 NTU for more than 15 minutes in a 24-hour period, the incident shall be reported within the monthly self-monitoring report. If the filtered effluent turbidity exceeds 0.5 NTU at any time, the incident shall be reported to the Regional Water Board and CDPH by telephone within 24 hours. A written report describing the incident and the actions undertaken in response shall be

included in the monthly self-monitoring report. Mitigation of the event shall consist of diverting all inadequately treated wastewater to temporary storage or an upstream process.

B. Disinfection Process Monitoring for Ultraviolet (UV) Disinfection System (Monitoring Location INT-002)

The following disinfection process monitoring requirements must be implemented:

1. **Monitoring.** The UV transmittance of the effluent from the UV disinfection system shall be monitored continuously and recorded. The operational UV dose shall be calculated from UV transmittance and exposure time, using lamp age and sleeve fouling factors.

2. **Compliance.** The UV transmittance shall not fall below 65 percent of maximum at any time, unless otherwise approved by CDPH. The operational UV dose shall not fall below 80 millijoules per square centimeter (mJ/cm2) at any time, unless otherwise approved by CDPH.

3. **Reporting.** The Discharger shall report daily average and lowest daily transmittance and operational UV dose on its monthly monitoring reports. If the UV transmittance falls below 65 percent or UV dose falls below 80 mJ/cm2, the event shall be reported to the Regional Water Board and CDPH by telephone with 24 hours. Any inadequately treated and disinfected wastewater shall be diverted to a storage basin or an upstream process for adequate treatment.

C. Visual Monitoring of Discharge (EFF-001) and Receiving Water (RSW-001)

Visual observations of the discharge and the receiving water shall be recorded monthly and on the first day of each intermittent discharge. Visual monitoring shall include, but not be limited to, observations for floating materials, coloration, objectionable aquatic growths, oil and grease films, and odors. Visual observations shall be recorded and included in the Discharger's monthly monitoring reports.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. **Schedules of Compliance.** If applicable, the Discharger shall submit all reports and documentation required by compliance schedules that are established by this Order. Such reports and documentation shall be

submitted to the Regional Water Board on or before each compliance date established by this Order. If noncompliance is reported, the Discharger shall describe the reasons for noncompliance and a specific date when compliance will be achieved. The Discharger shall notify the Regional Water Board when it returns to compliance with applicable compliance dates established by schedules of compliance.

B. Self Monitoring Reports (SMRs)

1. The Discharger shall submit electronic Self-Monitoring Reports (eSMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). The CIWQS Web site will provide additional directions for eSMR submittal in the event there will be service interruption for electronic submittal. The Discharger shall maintain sufficient staffing and resources to ensure it submits eSMRs that are complete and timely. This includes provision of training and supervision of individuals (e.g. Discharger personnel or consultant) on how to prepare and submit eSMRs.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. All monitoring results reported shall be supported by the inclusion of the complete analytical report from the laboratory that conducted the analyses.

4. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-9. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	Permit effective date	All	First day of second calendar month following month of sampling
Daily	Permit effective date	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	First day of second calendar month following month of sampling

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	First day of second calendar month following month of sampling
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	First day of calendar month through last day of calendar month	First day of second calendar month following month of sampling
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January through March April through June July through September October through December	First day of second calendar month following end of quarter
Annually	January 1 following (or on) permit effective date	January 1 through December 31	March 1, each year

5. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Minimum Level (ML), the Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

   The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

   a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (+ a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

6. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The reported data shall include calculation of all effluent limitations that require averaging, taking of a median, or other computation. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment. During periods of land discharge and/or reclamation discharge, the reports shall certify “land discharge” and/or “reclamation discharge”.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify:

i. Facility name and address;

ii. WDID number;

iii. Applicable period of monitoring and reporting;

iv. Violations of the WDRs (identified violations must include a description of the requirement that was violated and a description of the violation);

v. Corrective actions taken or planned; and

vi. The proposed time schedule for corrective actions.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the CIWQS Program Web site (http://www.waterboards.ca.gov/index.html). In the event that paper submittal is required, the Discharger shall submit the SMR to the address listed below:

Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

STANDARD MAIL	FEDEX/UPS/ OTHER PRIVATE CARRIERS
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15th Floor Sacramento, CA 95814

3. All discharge monitoring results required in accordance with C.2 above must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

D. Other Reports

1. The Discharger shall report the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions – VI.C.2 and 3 of this Order. The Discharger shall submit reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date in compliance with SMR reporting requirements described in subsection X.B.5 above.

2. **Water Reclamation System**

   a. **Reclamation Operations Reporting.** Upon completion and start-up of the Discharger's reclamation system, the Discharger shall submit reports pertaining to the operation, performance, monitoring, and other activities related to water reclamation as follows:

      i. **Quarterly Recycled Water Report.** The Discharger shall submit a quarterly recycled water summary report, as required by section 13523.1(b)(4) of the Water Code, containing the following information:

(a) Total volume of recycled water supplied to each recycled water user for each month of the reporting period;

(b) Total number of recycled water use sites;

(c) Locations of recycled water use sites, including a map and tabular summary with acreage and name of property owner;

(d) A summary of recycled water use site inspections conducted by the Discharger, including inspection dates and identification of recycled water user violations, including:

(1) all observations of recycled water overapplication and/or runoff,

(2) misuse of recycled water,

(3) cross-connections and/or improper backflow prevention devices, and

(4) any other violations of the Master Reclamation Permit or the Discharger's rules and regulations;

(e) A summary of operational problems, plant equipment malfunctions, and any diversion of recycled water which does not meet the requirements specified in this Order.

(f) Documentation of notifications to users if any recycled water was delivered that did not meet the requirements specified in this Order.

(g) A record of equipment or process failures initiating an alarm, as well as any corrective and preventative actions;

ii. **Annual Recycled Water Report.** The annual report shall contain the following:

(a) A compliance summary and discussion of the compliance record for the prior calendar year, including:

(1) If violations occurred, the report shall also discuss the corrective actions taken and planned to bring the reclamation program into full compliance with this Order.

(2) An evaluation verifying that the application of recycled water to each use area occurred at reasonable agronomic rates identified in the Irrigation Management Plans required by section C.5 of Attachment G and utilizing the data required by Table E-7 of the MRP. If the agronomic rate evaluation determines that exceedances of the agronomic rate may be occurring, the Discharger shall identify and implement

corrective actions to ensure recycled water use occurs at reasonable agronomic rates.

(3) Certification that all reasonable BMPs and management practices were implemented to ensure efficient and compliant operation of the recycled water system.

(4) Identification of any other problems that occurred in the recycled water system during the prior year and plans to rectify those problems in the coming year.

(b) A summary of scheduled and nonscheduled maintenance of the reclamation system appurtenances and irrigation areas;

(c) Enforcement and monitoring activities that occurred during the previous year, and identification of any problems and how the problems were addressed; and

(d) If applicable, a summary of all cross-connection testing and back-flow prevention activities (inspections, maintenance) and a summary of any problems identified, or certification that no problems occurred.

iii. **Other Recycled Water Reporting.**

(a) **New Use Site Reporting.** When new user(s) are considered to be added to the reclamation system, the Discharger shall notify the Regional Water Board of the new users in accordance with Water Reclamation Technical Report Requirement C.1.a.iii in Attachment G. The notice shall include the following: map identifying site location and location of irrigation system in relation to surface waters and wells; acreage involved; County Assessor Parcel number(s); name of property owner and/or user; user agreement; use site inspection schedule; and Operations and Management Plan (which includes an Irrigation Management Plan).

3. **Annual Report.** The Discharger shall submit an Annual Report to the Regional Water Board for each calendar year. The report shall be submitted by March 1st of the following year. The report shall, at a minimum, include the following:

a. Both tabular and, where appropriate, graphical summaries of the monitoring data and disposal records from the previous year. If the Discharger monitors any pollutant more frequently than required by this Order, using test procedures approved under title 40, section 136 or as specified in this Order, the results of this monitoring shall be included in the calculation and report of the data submitted SMR.

b. A comprehensive discussion of the facility's compliance (or lack thereof) with all effluent limitations and other WDRs, and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the Order.

c. The names, certificate grades, and general responsibilities of all persons employed at the Facility.

d. The names and telephone numbers of persons to contact regarding the wastewater treatment facility for emergency and routine situations.

e. A statement certifying when the flow meter(s) and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.

f. A statement certifying whether the current operation and management manual, and spill contingency plan, reflect the wastewater treatment facility as currently constructed and operated, and the dates when these documents were last reviewed and last revised for adequacy.

g. **Sanitary Sewer System Reporting.** The Discharger shall submit, as part of its annual report to the Regional Water Board, a description of the Discharger's activities within the sanitary sewer system over the previous 12 months. The report shall contain:

   i. A description of any change in the local legal authorities enacted to implement the Sewer System Management Plan (SSMP);

   ii. A summary of the SSOs that occurred in the past year. The summary shall include the date, location of overflow point, affected receiving water (if any), estimated volume, and cause of the SSO, and the names and addresses of the responsible parties as well as the names and addresses of the property owner(s) affected by the sanitary sewer overflow.

   iii. A summary of compliance and enforcement activities during the past year. The summary shall include fines, other penalties, or corrective actions taken as a result of the SSO. The summary shall also include a description of public participation activities to involve and inform the public;

   iv. Documentation that all feasible steps to stop and mitigate impacts of sanitary sewer overflows have been taken.

h. **Source Control Activity Reporting.** The Discharger shall submit, as part of its annual report to the Regional Water Board, a description of the Discharger's source control activities, as required by Provision VI.C.5.b. of this Order. This annual report is due on March 1st of each year.

i. A copy of the source control standards.

ii. A description of the waste hauler permit system.

iii. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of any industrial or commercial users under surveillance by the Discharger, an explanation of whether they were inspected, sampled, or both, the frequency of these activities at each user, and the conclusions or results from the inspection or sampling of each user.

iv. A summary of any waste survey results.

v. A summary of public participation activities to involve and inform the public.

i. **Biosolids Handling and Disposal Activity Reporting.** The Discharger shall submit, as part of its annual report to the Regional Water Board, a description of the Discharger's solids handling, disposal and reuse activities over the previous twelve months. At a minimum, the report shall contain:

i. Annual sludge production, in dry tons and percent solids

ii. A schematic diagram showing sludge handling facilities (e.g., digesters, thickeners, drying beds, etc.), if any and a solids flow diagram.

iii. Methods of final disposal of sludge:

(a) For any portion of sludge discharged to a sanitary landfill, the Discharger shall provide the volume of sludge transported to the land fill, the names and locations of the facilities receiving sludge, the Regional Water Board's WDRs order number for the regulated landfill, and the landfill classification.

(b) For any portion of sludge discharged through land application, the Discharger shall provide the volume of biosolids applied, the date and locations where biosolids were applied, the Regional Water Board's WDRs order number for the regulated discharge, a demonstration that the discharge was conducted in compliance

with applicable permits and regulations, and, if applicable, corrective actions taken or planned to bring the discharge into compliance with WDRs.

(c) For any portion of sludge further treated through composting, the Discharger shall provide a summary of the composting process, the volume of sludge composted, and a demonstration and signed certification statement that the composting process and final product met all requirements for Class A biosolids.

j. **Storm Water Reporting.** The Discharger shall submit, as part of its annual report to the Regional Water Board, an evaluation of the effectiveness of the Discharger's best management practices (BMPs) to control storm water, as well as activities to maintain and upgrade these BMPs.

k. **Chlorine Usage.** The Discharger is required to update the SOPs as needed and report any changes to the SOPs or change in chlorine usage. If there have been no changes to the SOPs or chlorine usage, the Discharger shall report that no changes have been made in the annual report.

l. **Recycled Water Pipe Identification.** The Discharger shall document compliance with California Health and Safety Code section 116815 regarding the installation and marking of recycled water piping.

E. Spills and Overflows Notification

1. All spills, unauthorized discharges, and sanitary sewer overflows (SSOs) equal to or in excess of 1,000 gallons or any size spill or SSO that results in a discharge to a drainage channel or a surface water:

a. As soon as possible, but not later than **two (2) hours** after becoming aware of the discharge, the Discharger shall notify the State Office of Emergency Services (OES), the local health officer or directors of environmental health with jurisdiction over affected water bodies or land areas, and the Regional Water Board.[26]

Information to be provided verbally to the Regional Water Board includes:

i. Name and contact information of caller;

[26] The contact number for spill reporting for the Office of Emergency Services is (800) 852-7550. The contact number of the Regional Water Board during normal business hours is (707) 576-2220. After normal business hours, spill reporting to OES will satisfy the 2 hour notification requirement for the Regional Water Board.

ii. Date, time and location of spill occurrence;

iii. Estimates of spill volume, rate of flow, and spill duration;

iv. Surface water bodies impacted, if any;

v. Cause of spill;

vi. Cleanup actions taken or repairs made; and

vii. Responding agencies.

b. As soon as possible, but not later than **twenty-four (24) hours** after becoming aware of a discharge, the Discharger shall submit to the Regional Water Board a certification that the State Office of Emergency Services and the local health officer or directors of environmental health with jurisdiction over affected water bodies or land areas have been notified of the discharge. For the purpose of this requirement, "certification" means an OES certification number and, for the local health department, name of local health staff, department name, phone number and date and time contacted.

c. Within **five (5) business days**, the Discharger shall submit a written report to the Regional Water Board office. The report must include all available details related to the cause of the spill and corrective action taken or planned to be taken, as well as copies of reports submitted to other agencies.

i. Information provided in the verbal notification;
ii. Other agencies notified by telephone;
iii. Detailed description of cleanup actions and repairs taken; and
iv. Description of actions that will be taken to minimize or prevent future spills.

d. In the cover letter of the monthly monitoring report, the Discharger shall include a brief written summary of the event and any additional details related to the cause or resolution of the event, including, but not limited to results of any water quality monitoring conducted.

2. All spills, unauthorized discharges, and sanitary sewer overflows (SSOs) less than 1,000 gallons that do not reach a drainage channel or a surface water:

a. As soon as possible, but not later than **twenty-four (24) hours** after becoming aware of the discharge, the Discharger shall notify the Regional Water Board and provide the applicable information in requirement 1.a of this section.

b. In the cover letter of the monthly monitoring report, the Discharger shall include a written description of the spill event.

Original Signed By

Ordered by: _____

Matthias St. John
Executive Officer

September 2, 2014

10_0034_NPDESPermit_Healdsburg_WWTP_MRPRevision

Attachment E-1. Final Copper Effluent Limitations[1]

Hardness[2] (mg/L as $CaCO_3$)	CCC[3] 4-Day Average (µg/L)	CMC[4] 1-Hour Average (µg/L)	0.62*CCC[5]	0.41*CMC[4]	Lowest LTA[6]	AMEL[7] (µg/L)	MDEL[8] (µg/L)
5	0.72	0.83	0.45	0.34	0.34	0.47	0.83
10	1.3	1.6	0.81	0.66	0.66	0.91	1.59
15	1.8	2.3	1.14	0.96	0.96	1.34	2.32
20	2.4	3.1	1.46	1.26	1.26	1.75	3.05
25	2.9	3.8	1.77	1.55	1.6	2.16	3.76
30	3.3	4.5	2.07	1.85	1.8	2.57	4.47
35	3.8	5.2	2.36	2.13	2.1	2.97	5.17
40	4.3	5.9	2.64	2.42	2.4	3.36	5.86
45	4.7	6.6	2.92	2.70	2.7	3.76	6.55
50	5.2	7.3	3.20	2.99	3.0	4.15	7.23
55	5.6	8.0	3.47	3.27	3.3	4.54	7.91
60	6.0	8.7	3.74	3.55	3.5	4.93	8.58
65	6.5	9.3	4.00	3.82	3.8	5.32	9.26
70	6.9	10	4.26	4.10	4.1	5.70	9.93
75	7.3	11	4.52	4.38	4.4	6.08	10.59
80	7.7	11	4.78	4.65	4.7	6.47	11.26
85	8.1	12	5.03	4.92	4.9	6.85	11.92
90	8.5	13	5.29	5.20	5.2	7.22	12.58
95	8.9	13	5.54	5.47	5.5	7.60	13.23
100	9.3	14	5.78	5.74	5.7	7.98	13.89
105	9.7	15	6.03	6.01	6.0	8.35	14.54
110	10	15	6.27	6.28	6.3	8.72	15.18
115	11	16	6.52	6.55	6.5	9.06	15.77
120	11	17	6.76	6.82	6.8	9.40	16.36
125	11	17	7.00	7.08	7.0	9.73	16.94
130	12	18	7.24	7.35	7.2	10.06	17.51
135	12	19	7.47	7.62	7.5	10.39	18.09
140	12	19	7.71	7.88	7.7	10.72	18.66
145	13	20	7.95	8.15	7.9	11.04	19.23

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1 All copper effluent limitations calculated using default Water Effect Ratio of 1.0 and default dissolved-to-total metal translators to convert copper water quality objectives from dissolved to total recoverable.

2 Hardness = hardness of the receiving water at the time the discharge is sampled

3 CCC (Criteria Continuous Concentration) = (0.8545*(LN(hardness))-1.702

4 CMC (Criteria Maximum Concentration) = (0.8545*(LN(hardness))-1.702

5 Calculated using a coefficient of variation (CV) of 0.44

6 LTA = Long-term average

7 AMEL (Average Monthly Effluent Limitation) = 1.39*(minimum 0.62CCC,0.41CMC)

8 MDEL (Maximum Daily Effluent Limitation) = 2.42*(minimum 0.62CCC,0.41CMC)

Hardness[2] (mg/L as $CaCO_3$)	CCC[3] 4-Day Average (µg/L)	CMC[4] 1-Hour Average (µg/L)	0.62*CCC[5]	0.41*CMC[4]	Lowest LTA[6]	AMEL[7] (µg/L)	MDEL[8] (µg/L)
150	13	21	8.18	8.41	8.2	11.37	19.79
155	14	21	8.41	8.67	8.4	11.69	20.36
160	14	22	8.64	8.94	8.6	12.01	20.92
165	14	22	8.87	9.20	8.9	12.33	21.47
170	15	23	9.10	9.46	9.1	12.65	22.03
175	15	24	9.33	9.72	9.3	12.97	22.58
180	15	24	9.56	9.99	9.6	13.29	23.13
185	16	25	9.78	10.25	9.8	13.60	23.68
190	16	26	10.01	10.51	10.0	13.91	24.22
195	17	26	10.23	10.77	10.2	14.23	24.77
200	17	27	10.46	11.03	10.5	14.54	25.31
205	17	28	10.68	11.29	10.7	14.85	25.85
210	18	28	10.90	11.55	10.9	15.16	26.39
215	18	29	11.12	11.81	11.1	15.46	26.92
220	18	29	11.35	12.06	11.3	15.77	27.46
225	19	30	11.57	12.32	11.6	16.08	27.99
230	19	31	11.78	12.58	11.8	16.38	28.52
235	19	31	12.00	12.84	12.0	16.68	29.05
240	20	32	12.22	13.10	12	16.99	29.58
245	20	33	12.44	13.35	12	17.29	30.10
250	20	33	12.66	13.61	13	17.59	30.63
255	21	34	12.87	13.87	13	17.89	31.15
260	21	34	13.09	14.12	13	18.19	31.67
265	21	35	13.30	14.38	13	18.49	32.19
270	22	36	13.52	14.63	14	18.79	32.71
275	22	36	13.73	14.89	14	19.08	33.22
280	22	37	13.94	15.14	14	19.38	33.74
285	23	38	14.15	15.40	14	19.67	34.25
290	23	38	14.37	15.65	14	19.97	34.77
295	24	39	14.58	15.91	15	20.26	35.28
300	24	39	14.79	16.16	15	20.56	35.79
310	25	41	15.21	16.67	15	21.14	36.80
320	25	42	15.63	17.17	16	21.72	37.82
330	26	43	16.04	17.68	16	22.30	38.82
340	27	44	16.46	18.18	16	22.88	39.83
350	27	46	16.87	18.69	17	23.45	40.83
360	28	47	17.28	19.19	17	24.02	41.82
370	29	48	17.69	19.69	18	24.59	42.81
380	29	49	18.10	20.19	18	25.16	43.80
390	30	50	18.50	20.69	19	25.72	44.78
400	30	52	18.91	21.19	19	26.28	45.76
>400	30	52	18.91	21.19	19	26.28	45.76