Response: Attachment A of the Recycled Water Policy (Requirements for Monitoring Constituents of Emerging Concern for Recycled Water) states that monitoring of health-based CECs or performance indicator CECs is not required for recycled water used for landscape irrigation because there is a low risk for ingestion of recycled water. Further, the Policy (Attachment A, section 1.1) states that the "Regional Water Boards shall not issue requirements for monitoring of additional CECs in a recycled water beyond the requirements in the Policy except when monitoring is recommended by CDPH or requested by the recycled water project proponent." The draft Permit is consistent with the Policy.

Regional Water Board staff is participating in the development of a pilot study that will investigate the presence of CECs in receiving waters statewide. Staff anticipates that the study will provide guidance for monitoring of municipal wastewater treatment effluent and receiving waters for CECs. Recommendations from this study could then be incorporated into discharge permits in the north coast region.

Comment No. 14: Lack of Enforcement for Over-irrigation Incidents. What administrative penalties for over irrigation have been handed out? RRWPC has filed complaints on multiple Rohnert Park and Santa Rosa over-irrigation incidents, with numerous dated and identified photos, and nothing seemed to happen in the public view. What does it take for the Regional Board to issue a Cease and Desist Order? How can the public maintain confidence in this process when things are somehow dealt with behind the scenes?

Response: ACL Order No. R1-2010-0075, adopted by the Regional Water Board on October 28, 2010, assessed a total civil liability of $72,750 for permit violations, including violations for discharges of reclaimed water to surface water. A Notice of Violation and a notice to submit a technical report under section 13267(b) of Cal. Wat. Code was issued on February 22, 2010, for incidents of over-irrigation at water reuse sites in Rohnert Park that occurred in August 2009. The City responded by amending its runoff incident notification procedures and expanding its operator working hours to have system coverage from 4:30 am to 9:00 pm, when most irrigation takes place. The Notice of Violation and the City's Technical Report are on file at the Regional Water Board office.

The North Coast Regional Water Board and its staff endeavor to make the permitting process, from the preparation of the draft Order through permit adoption, as transparent as possible. Regional Water Board staff's efforts to assess and ensure permit compliance, including taking appropriate enforcement for noncompliance, are conducted in a manner that attempts to balance staff resources and state and regional priorities while remaining in compliance with the State's Enforcement Policy. The Regional Water Board and its staff encourage public participation in its mission to protect water quality by providing public notice of its decisions in accordance with state and federal law.

Comment No. 15: Inadequate Consideration of Public Comments. RRWPC has a similar concern (lack of public process) about the Nutrient Offset program. Santa Rosa identified an offset project (Beretta Dairy). There was a public comment period. RRWPC submitted a lengthy letter, and the next thing we heard, the project had been approved. Now, a new

notice has gone out on a different project. What's the point of commenting, when the public is not included in the process?

Response: The City's Nutrient Offset Program is not the topic of the Proposed Order. However, responses to comments on actions taken by the Regional Water Board or its Executive Officer are made available to the public at public hearings and/or through posting on the Regional Water Board website. In the case of the Beretta Dairy nutrient offset credit project, a response to written comments was posted on the website with the notification by the Executive Officer approving the project. Public participation in the consideration of this project was consistent with conditions of the Nutrient Offset Program.

Comment No. 16: Consideration of Dilution and Temperature when Establishing Effluent Limitations. Another factor inadequately considered, is that of discharge to a waterway when low flows predominate. Could one say that even a small discharge into a very low flowing and water quality impaired stream, will have a much bigger impact than if normal flows were taking place. The NPDES discharge permit covers the period when flows tend to be higher and therefore the impaired constituent would be somewhat diluted. Is dilution considered when setting standards? If it is, then shouldn't standards be raised when discharge is allowed under summer conditions, especially where heat is a factor?

In fact, the impacts of this discharge on the environment during summer conditions have not been fully explored. We all know, even without scientific studies, that the Laguna impairments are greatly exacerbated during heated summer conditions. We wonder if that was factored in when the standards were set. Whether or not it was, shouldn't it be considered now?

Response: The draft Order limits the discharges to surface water to the period from October 1 through May 14 and prohibits the Permittee's discharge of treated wastewater at a rate that exceeds five percent of the flow of the Russian River. In addition, the Permittee modulates its discharge from Delta Pond, currently the City's exclusive discharge point, in accordance with a discharge flow model that effectively limits the discharge volume significantly below the five percent permitted flow. These requirements prohibit the Permittee's ability to discharge during the summer and significantly limit discharges during other times when surface water flows in the watershed are low. In addition, as a practical matter, discharges to surface water during dry conditions are rare because it is during these conditions that the Permittee is using treated wastewater for fulfilling commitments to recycled water users and has no incentive to "waste" water that can be reused.

Comment No. 17: Incidental Runoff and Seasonal Discharge Prohibition. There seems to be an internal conflict in the permit:

In reference to the summer discharge prohibition, the Fact Sheet states on page F-24, "*The discharge of wastewater effluent from the Subregional System...is prohibited during the period of May 15th to September 30th....*" And it explains, "*The original intent of this prohibition was to prevent the contribution of wastewater to the baseline flow of the Russian River during the period of the year when the Russian River and its tributaries experience the heaviest water contact recreation use.*" Did the standard change when the discharge went

from point to non-point / virtue of its use as irrigation? s assumption that only occasional and minimal discharges will occur is simply not verifiable by the record, since it is so hard to ascertain the estimates of runoff that actually occurred.

Response: The season discharge prohibition applies to all discharges of municipal waste to the Russian River and its tributaries. This prohibition also applies to treated municipal wastewater suitable for reclamation. Incidental runoff of irrigated recycled water may be authorized under terms of a NPDES permit where BMPs are established to minimize the volume and frequency of incidental runoff.

Incidental runoff that occurs as a result of urban irrigation is regulated under the City's MS4 permit and the City's NPDES permit (Master Reclamation Permit). Larger, unauthorized discharges of runoff of reclaimed water do occur on occasion as a result of mechanical failures, human error, and other reasons. Regional Water Board staff is notified of these violations and have been working with the Permittee to correct deficiencies in water reclamation system so as to minimize occurrences of incidental runoff and prevent larger runoff events.

Comment No. 18: Protection of Public Health and Trihalomethanes in Effluent. The Fact Sheet at pages F-28 & 29 indicates that the RPA for dichlorobromomethane and chlorodibromomethane indicates their limits may be exceeded through the discharge of wastewater. How will public health and other beneficial uses be protected if these substances are distributed on the land and into the atmosphere through the spray process? In fact, what is the fate of public health if this is sprayed into areas where the public is present? (Size and strength of spray is an issue also that needs to be considered when calculating agronomic rates of application. There is one property on Guerneville Rd. by Campobello that uses a gigantic spray that I often see going into the nearby creek and occasionally into the road. It's an agricultural field around 3200 Guerneville Rd. on south side of road.)

Response: The public health risk from exposure to recycled water is managed through compliance with water recycling regulations established by CDPH. The Proposed Order is consistent with CDPH regulations.

Comment No. 19: No Demonstration of Compliance with Anti-Degradation Policy. While no net loading of nutrients is applied to surface discharge, when the discharge is considered reclamation, the no net discharge does not seem to apply in that monitoring for phosphorus is not required for landscape irrigation (or for endocrine disrupting chemicals either). Unless there are specific application rates in the reclamation permit, there will be no clear handle to judge compliance and whether anti-degradation standards are being met.

Response: The effluent limitation for no net loading of total phosphorus specified in section IV.A.2.b of the draft Order applies only to the surface water discharge points identified in Table E-2 of the MRP. There are no monitoring requirements for reclaimed water for phosphorus because nitrogen typically governs the agronomic rate calculation. Accumulation of phosphorus in the soil is expected to be minimal because the treated effluent has low total phosphorus concentration compared to plant demand (see the City of Santa Rosa website at http://ci.santa-rosa.ca.us/departments/utilities/recycle/landscapeinfo/Pages/RecycledWaterQualityandPlant

Needs.aspx) and there is plant uptake after recycled water application. Migration of phosphorus to surface water through landscape irrigation is also expected to be minimal because incidental runoff is infrequent and low volume and recycled water is applied in vegetated areas where erosion of phosphorus-bound soil is prevented through site-specific BMPs.

Comment No. 20: Phosphorus Levels Need more Study and Control. The Fact Sheet (Page F-31) includes a table that compares typical water quality levels of other water bodies with Santa Rosa's Total Kjeldahl Nitrogen (TKN) and Total Phosphate. Other nutrient impaired water bodies averaged 1.06 for Nitrogen and 0.60 for Phosphate. Santa Rosa's average readings for TKN and Total Phosphate between September 2006 and August 2010 was 1.3 and 2.2, respectively. That means Santa Rosa's phosphate readings are almost four times the level of other impaired water bodies and much more than what I believe is normally recommended (0.01 mg/L). Does this not justify the thorough study of phosphorus for irrigation use and the implementation of VERY stringent measures to prevent all runoff? Do the limitations noted on top of Page F-32 apply to reclamation wastewater? If so, there should be very few circumstances, and those should be much more specifically defined, where 'incidental runoff' should be allowed.

The Reclamation Permit fails to specify phosphorus limits to be met and monitored for the Salt & Nutrient Management Plan.

The section on Aquatic Toxicity goes on to state that effluent monitoring for nitrate and ammonia. Why was phosphorus not included?

Why is there no RPA for Phosphorus but there was for ammonia and nitrates? (p. F-39)

Response: Although phosphorus is the biostimulatory substance of importance for the Laguna de Santa Rosa and is thought to be the primary cause of the impairment of the water body, there is no evidence that phosphorus loading from incidental runoff is a significant source compared to other nonpoint source discharges, regulated point sources, and sediment-sequestered phosphorus. See Response to Comment 18, above. More work is being done by Regional Water Board staff and others to identify pathways for delivery of phosphorus to the Laguna as part of the Nutrient TMDL for the greater Laguna de Santa Rosa watershed.

Because phosphorus is identified as a biostimulatory substance, the draft Order includes monitoring requirements for total phosphorus for surface water discharge points identified in Table E-2 of the MRP. Data collected in the course of complying with this Permit may be used to inform the SNMP. Provisions and requirements of the SNMP, where applicable to the regulated discharges, will be incorporated into the Permittee's discharge permit after completion of the SNMP. The draft Order contains a reopener provision to incorporate these provisions. This approach is consistent with the Water Recycling Policy.

Phosphorus is not referred to in the Aquatic Toxicity section of the Fact Sheet because phosphorus is not considered by Regional Water Board staff as a contributing source of aquatic toxicity.

The need for WQBELs for phosphorus was considered in section IV.C.3.a.i (Biostimulatory Substances) of the Fact Sheet. The determination is the effluent

limitations for phosphorus were needed. Because establishing a numeric WQBEL for phosphorus is deemed infeasible, a narrative (BMP-based) WQBEL, expressed as no net loading, is specified. If the Nutrient TMDL currently in development for the Laguna de Santa Rosa assigns a waste load allocation to the WWTP, the permit may be reopened to include effluent limitations for phosphorus that implement the TMDL.

Comment No. 21: No Recognition and Control of Summer Discharges Via Incidental and Irrigation Runoff. The permit assumes that summer discharges will be negligible based on some anticipated agronomic studies that will occur in the future. While it is true that the permit can be reopened, as mentioned before, we don't trust the process if nighttime irrigation is promoted and allowed. RRWPC photographs of runoff that included pictures of irrigation water running down the drain clearly indicated that it was occurring and when it was occurring (date). Yet we were told we didn't have enough information with our photos. (All were clearly identified as to location, time, and temperature).

The public has the same problem. We don't trust that this runoff is benign, is as low an amount as claimed in reports, is monitored and reported in a timely fashion, and is so negligible as to not causing any water quality problems and meets anti-degradation requirements. If water quality is to be protected, and anti-degradation requirements met, it is critical that specific guidelines be included in the Reclamation Permit that calls for setbacks, preference for drip rather than spray irrigation, (more stringent controls needed for spray), limitations on strength of spray, specific criteria for determining agronomic rates that should be adjusted daily, if not hourly, more regular inspections by irrigating staff, periodic inspections by Regional Board staff, etc. (In fact, our concerns seem justified by the table on page F-31 of the Fact Sheet).

Since no net loading is allowed for regular winter discharges, at what point does that standard apply for summer irrigation runoff, when the nutrient problem is often greatly exacerbated in the Laguna and Russian River? Further, when we are in a drought period with high temperatures, the nutrient problem can become so great that even a little runoff can become a serious problem, especially in relation to algae, Ludwigia, and other invasive species. The exact point at which runoff becomes a permit violation is undefined. If this is incorrect, please spell out the specific measurable circumstances where a violation will be known to occur. This is particularly important where nutrients are concerned.

Response: The Recycled Water User's Guide includes City policy that requires use of point application methods (drip irrigation) where overhead irrigation would result in overspray, runoff, or nonuniform application for irrigation projects initiated after 2007. The City policy also requires design of irrigation systems to prevent runoff and overspray onto adjacent pavement, sidewalks, structures and other nonlandscaped areas. The City policy does not apply to urban and agricultural irrigation projects that commenced before 2007. The Water Reclamation Permit (Attachment G, Provision B.12) specifies a 100-foot setback to all surface water and "appropriate" setbacks to street gutters and storm drain inlets for new recycled use sites. Regional Water Board staff is working with the Permittee to ensure that operation and management at urban and agricultural irrigation projects that commenced before 2007 are effective in preventing runoff and minimizing incidental runoff.

Runoff at individual irrigation sites that does not meet the conditions of incidental runoff constitutes permit noncompliance and noncompliance is subject to enforcement action by the Regional Water Board. There is no threshold of runoff volume that

distinguishes incidental runoff from runoff that is in violation of the permit. Unauthorized discharges of 50,000 gallons or more of tertiary treated recycled water require timely notification to the Regional Water Board pursuant to state regulations (Cal. Water Code section 13529.2). However, formal enforcement by the Regional Water Board for water quality violations, including incidents of runoff or spills of tertiary-treated recycled water, is taken in accordance with the State Water Board's Enforcement Policy to ensure the most efficient and effective use of available resources.

Comment No. 22: Radiological Waste. On the top of page F-25 (No. 11), it states that discharge of radiological waste is prohibited. Since all such waste has a very long half-life, and since radiological waste is now regularly flushed down toilets, how does treatment plant deal with this? The waste has to go somewhere, and wherever it goes, it's radioactive. I have never heard this addressed anywhere. How can the public be assured that the treated waste that is sprayed on play areas where the general public recreates is not radioactive?

Response: Monitoring data for radioactivity in the Permittee's recycled water is available in the City's Discharge Compliance Project EIR. Staff has reviewed this data and determined that there is no reasonable potential for the discharge to exceed MCLs for the radionuclides measured (uranium, radium (226+228), gross alpha, gross beta, tritium and strontium 90). Nevertheless, periodic monitoring to determine the level of these radionuclides in the treated effluent is reasonable. Accordingly, once per permit term monitoring of the treated effluent for uranium, radium (226+228), gross alpha, gross beta, tritium and strontium 90 has been added to the Proposed Order.

Comment No. 23: Permit does not Comply with Anti-Degradation Policy. On page F-47 of the Fact Sheet, it states: *"The authorized rate of discharge is increased above that of the previous permit, but the rate of discharge authorized to discharge to surface waters has not increased."* It goes on to state that the increased volumes of water will go to the Geysers and to the Urban Reuse Project. Once again, we challenge that the rate of discharge will increase with summer runoff, unless most stringent requirements are placed in permit to assure that won't happen. Some think that past behavior is predictive of future actions.

Response: The Water Recycling Policy found that water recycling projects complying with the Policy, collectively, satisfy the requirements of Resolution No. 68-16. The Water Recycling Policy goes on to state that recycled water projects within a groundwater basin where a salt and nutrient management plan is being prepared may be approved by the Regional Water Board if the project meets the criteria for a streamlined irrigation permit and the project uses less than 10 percent of the available assimilative capacity of the basin or less than 20 percent of the available assimilative capacity for multiple projects in a basin. The draft SNMP prepared by the City of Santa Rosa predicts that the concentrations for both TDS and nitrate will increase over a 25-year time horizon based on the analysis and use a portion of the assimilative capacity, but that the incremental contribution of regional stakeholders recycled water goals is minimal, with new recycled water from all stakeholder's recycled water will contribute less than one percent of the of the total mass loading of TDS and no additional mass loading of nitrate.

Regional Water Board staff does not agree that increased water reclamation will

necessarily increase t volume of incidental runoff that ent surface water and cause degradation of water quality. If it is determined that a project will not result in a lowering of water quality, no anti-degradation analysis is required and the Anti-degradation Policy is satisfied.

Comment No. 24: Lack of Response to Spill Reports. When RRWPC filed a complaint on Rohnert Park's over irrigation practices, we discovered that Rohnert Park and Santa Rosa had an agreement that was about 17 years old at the time and had never been enforced. Supposedly, Santa Rosa had not monitored Rohnert Park's irrigation. We documented a great deal of runoff that was repeated over a period of time. We never got formal feedback on this by Regional Board staff although we understand there were some changes made. North Coast Board should review reclamation contract between Rohnert Park and Santa Rosa every two years to ascertain that it is adequate and being fully implemented.

Response: See response to Comment No. 14. Also, Regional Water Board staff will review the contract between the City of Rohnert Park and the Permittee to ensure that the agreement is consistent with the requirements of the State's Water Recycling Policy and this Order.

Comment No. 25: Salt and Nutrient Management Plan and Anti-degradation. Discharge of recycled water, according to Fact Sheet (Page F-48) may result in degradation in ground water from salts and nutrients. This is expected to be addressed in the Salt and Nutrient Management Plan. We wonder if buildup of salts in soils, the reason why many vineyard managers are hesitant to use recycled wastewater, will be studied in the Salt and Nutrient Management Plan. Nonetheless, when a problematic issue comes up around this plan, and the possibility of some degradation is acknowledged, the phrase "*maximum benefit to the State*" appears to make some degradation equal in importance to increased water supplies. Six very non-specific goals are then stated to assure that water quality will not be degraded as a result of this project.

Response: The State's Water Recycling Policy and the included requirements of the Salt and Nutrient Management Plan are not the subject of the Proposed Order.

Comment No. 26: Recycled Water Requirements and Anti-degradation. The Fact Sheet describes (Page F-50) requirements in the Reclamation Permit that gives terms of this Order. This includes programmatic and site-specific technical reports containing hydraulic and nutrient agronomic rates for every new irrigation project that comes on line. RRWPC believes that ALL reclamation sites should be held responsible for such reports and that the reports should detail the conditions under which irrigation should take place. (John Short addresses this also.) There should be no irrigation in winter months and/or when the temperature reaches a certain level, say 45 degrees. (So little water can be soaked up by the ground when cold temperatures prevail that it's not worth the energy needed to irrigate.) Slopes should be considered and setbacks from streams should be required of all irrigators, not just new ones. Wind, weather forecasts, soil type, saturation, etc. should all be considered no less than on a weekly basis. And types and strengths of sprays should also be addressed.

Response: The requirements for site-specific technical reports for new irrigation

projects have been removed from the Proposed Order. The rationale for the removal of these requirements is that the Permittee's Recycled Water User's Guide provides adequate guidelines for new recycled water projects to prevent runoff and minimize incidental runoff. Given the variability of irrigation use sites and the wide range of weather conditions, prescriptive requirements in the Order, such as conditions under which irrigation is allowable, and specifications for allowable irrigation system components are unnecessary as long as the Recycled Water User's Guide is followed and problems are corrected in a timely manner. Where the Permittee authorizes irrigation at existing reuse sites, or where the Recycled Water User's Guide does not apply, Regional Water Board staff will work with the Permittee to ensure that the Permittee enforces conditions upon recycled water users that prevent runoff and minimize incidental runoff.

Comment No. 27: Determination of Agronomic Application Rate. The length of time it will take to complete and implement the Salt & Nutrient Management Plan and Engineering Study to determine agronomic rates and impacts of salt and nutrients is unreasonable (up to five years).

Response: The compliance schedule for the Salt and Nutrient Management Plan is not the subject of the Proposed Order. Nevertheless, Regional Water Board staff has determined that the City's Recycled Water User's Guide is adequate to minimize the impact of recycled water use in the Santa Rosa groundwater basin.

Comments from RRWPC submitted on July 22, 2013, are grouped into topics and summarized here by Regional Water Board staff. Please refer to the comment letter for the full text of comments. The following are staff responses to significant comments from the RRWPC:

TOPIC 1: Effluent Limitations for Total Nitrogen

Comment No. 1a: The new mass emission rate limitation alters the intent of the previous permit and appears to constitute permit backsliding. No additional nutrients discharges to creeks should be allowed until the TMDL is complete.

Response: The less stringent effluent limitation for total nitrogen in the Proposed Order is allowable under federal regulations preventing backsliding in permits, based on new information available to Regional Water Board staff that was not available when the previous permit was adopted. Compliance with the anti-backsliding policy is discussed in detail in sections III.B.7 and IV.D.1 of the Fact Sheet. See also Regional Water Board staff's response to Comment 1 from the City of Santa Rosa's July 2013 comment letter for additional information about the RPA for total nitrogen and total phosphorus.

Effluent limitations for nitrogen and phosphorus may be modified based on results of an approved Nutrient TMDL for the greater Laguna de Santa Rosa.

Comment No. 1b: Does the limitation include loadings from storm water runoff, irrigation runoff, or seepage of irrigation water into creeks through groundwater transport?

Response: No. The effluent limitation for phosphorus applies only to end-of-pipe discharges to surface water. Discharges of irrigation runoff to surface waters are not authorized by this permit, and consequently, nutrient loading that results from this unauthorized discharge is not included in the surface water effluent limitations for phosphorus or nitrogen.

Nutrient loading from storm water from the City of Santa Rosa is also not included in the effluent limitations for phosphorus and nitrogen because storm water is not regulated by the Proposed Order.

Regional Water Board staff has very limited information to quantify nutrient loading to creeks that can be attributed to nitrogen in the City's recycled water. If recycled water is applied at agronomic rates and incidental runoff is minimized, nitrogen loading from this source is assumed to be low; however, this question might be considered in the development of the nutrient TMDL for the greater Laguna de Santa Rosa watershed.

Comment No. 1c: Can nitrogen convert to nitrate in groundwater.

Response: Yes. Conversion of nitrogen to ammonium, nitrate and nitrite occurs in soil through the natural process of biodegradation.

Comment No. 1d: Irrigation spills result in a significant amount of nitrogen discharged to the Laguna during the summer. Special nutrient studies should be conducted upstream and downstream of Rohnert Park and Santa Rosa creeks to discover the extent of the impact of irrigation runoff.

Response: Irrigation runoff and spills of recycled water not meeting the definition of incidental runoff are not authorized by this permit and are subject to enforcement actions by the Regional Water Board. Requirements to investigate the impact of unauthorized discharges would be most appropriately established as part of an enforcement action. However, given the geographic and temporal variability of irrigation runoff events and the presence of other sources of pollutants entering creeks, it would be challenging to develop a study that could clearly identify effects of irrigation runoff.

TOPIC 2: Reclamation Operation: Discharge Management Plan

Comment No. 2a: This document should be determined by the Regional Water Board Executive Officer to be inadequate because it does not describe the operation of the irrigated water component of the Subregional System.

Response: The Permittee's "Discharge Management Plan" was submitted in compliance with a requirement contained in Waste Discharge Requirements Order No. R1-2006-0045 that requires the Permittee to operate its recycled water and disposal flows in accordance with the 2003 *Geyser's Discharge Management Plan.* This Plan was approved by the Executive Officer. The "Discharge Management Plan" provides an update to that document. The Proposed Order requires the Permittee to submit in its Quarterly and Annual Recycled Water Reports much more detailed information about the Permittee's recycled water program than has been required in the past.

Comment No. 2b: Does the term "discharge" refer to winter discharge to surface waters and not summer irrigation?

Response: Regional Water Board staff has adopted the convention of referring to discharges of waste to land and surface water as "discharges" and differentiated that term from recycled water use and application.

TOPIC 3: Reclamation Capacity

Comment No. 3a: RRWPC requests that detailed analysis of urban irrigation wastewater applications be fully analyzed to assure that all reclamation requirements are followed, monitored, and enforced.

Response: Before a water recycling project is approved, the Permittee must prepare and submit to CDPH a title 22 engineering report that demonstrates how the recycled water user will comply with title 22 water recycling regulations. To be issued a permit from the City of Santa Rosa the recycled water customer must agree to comply with local rules, regulations, and standards of the Recycled Water User's Guide. Failure to comply with the recycled water user permit may result in termination of recycled water service.

Regional Water Board staff endeavor to ensure that all permittees fully comply with waste discharge requirements and to take appropriate enforcement actions when there is noncompliance. To date, the Regional Water Board staff has conducted thorough reviews of compliance with permit requirements at some use sites within the Rohnert Park area, primarily in response to complaints. However, more detailed analyses of other irrigation sites could be conducted by Regional Water Board staff where site conditions or compliance history indicate that more attention is needed.

Comment No. 3b: RRWPC requests that the definition of 'acres' on urban irrigation sites not include buildings and impervious surfaces as part of the irrigation area.

Response: Regional Water Board staff reviewed the Title 22 Engineering Report for the Permittee's urban water reuse program submitted to the Regional Water Board on March 15, 2011, for irrigation sites along Stony Point Road between West College Avenue and Occidental Road, along Stony Circle, and for portions of Glenbrook Drive and Occidental Road in Santa Rosa and confirmed that the recycled water use areas are clearly identified in the design drawings and the stated square footage is consistent with the demarcated landscape areas.

Comment No. 3c: RRWPC requests that agronomic rates defined for each parcel and parcel maps showing specific areas to be irrigated to avoid impervious surfaces and consequent runoff.

Response: Comment noted. It is the expectation of Regional Water Board staff that the agronomic rate calculation not include the area of impervious surfaces.

Comment No. 3d: RRWPC believes that in constrained urban areas, only drip irrigation and very low pressure spray should be used to apply wastewater.

Response: Regional Water Board staff agrees that drip irrigation and low pressure sprays are ideally suited for constrained areas and areas where there is an elevated risk for runoff as a result of site conditions.

Comment No. 3e: RRWPC believes that it essential that conditions for cutting off water delivery of repeat runoff offenders should be spelled out clearly.

Response: Section B.5 (Attachment G) of the Proposed Order requires that the Permittee discontinue recycled water service if there is reason to believe that recycled water requirements are not being met and cannot be immediately corrected. Regional Water Board staff has been working with the Permittee to strengthen its procedures for ensuring compliance with water reclamation requirements, including termination of water service for sites where there is repeated noncompliance.

TOPIC 4: Monitoring Program

Comment No. 4a: It constitutes backsliding that visual observations are proposed to be conducted monthly instead of weekly.

Response: Water reclamation requirements in the Proposed Order implement state law and, as such, are not subject to federal anti-backsliding requirements. Even if water reclamation requirements were subject to anti-backsliding, the Proposed Order would not violate the requirement because the previous permit did not require visual monitoring of any frequency. The Proposed Order establishes the new permit requirement.

Comment No. 4b: RRWPC recommends that the permit require that the frequency of visual observations be adjusted according to the volume applied and user's compliance history.

Response: Regional Water Board staff agrees that the frequency of visual monitoring should be adjusted to account for site conditions. Footnote 6, Table E-7, of the Proposed Order was revised to state that "...visual observations shall be conducted at least monthly, with more frequent monitoring at reuse sites where site conditions result in an elevated threat of runoff and at reuse sites where incidental runoff events are routinely reported. Visual observations shall be used to verify..." (emphasis added) Regional Water Board staff will also work with the Permittee to incorporate this concept into its Recycled Water User's Guide and/or its Non-Storm Water BMP Plan.

Comment No. 4c: Based on the City's reclamation records, the City of Rohnert Park is regularly overirrigating, resulting in multiple and high volume spills.

Response: Regional Water Board staff shares the commenter's concerns about recycled water runoff from reuse sites in Rohnert Park and is working with the Permittee to revise its program to better prevent the occurrence of these runoff events and to improve enforcement of program violations when they occur.

Comment No. 4d: Has Regional Water Board staff checked to see if reclaimed water use notification signs are present at schools in Rohnert Park?

Response: Regional Water Board staff last inspected recycled water use sites in the Subregional System in 2011. Notification signs were observed at City parks. Schools that use recycled water were not included in that inspection.

Comment No. 4e: Reclamation reports should include a detailed irrigation plan to prevent discharge to impervious surfaces where runoff can occur.

Response: The Permittee requires that each site prepare a detailed irrigation plan prior to granting approval for receipt of recycled water.

TOPIC 5: 2010 Rohnert Park Complaint

Comment No. 5: Given the irrigation runoff at Rohnert Park schools, parks, playgrounds, and the community center, it is unacceptable that the draft permit reduces visual monitoring requirements from weekly to monthly. The Commenter goes on to describe results of her review of recycled water use inspection reports that appear to unrealistic, misleading, or inadequate to document runoff.

Response: Although the minimum inspection frequency required by the permit was changed from weekly in the October 2012 draft Order to minimum of monthly inspections in the Proposed Order, the City's Recycled Water User's Guide (page 20) recommends weekly or twice-monthly inspections. Regional Water Board staff has been assured by the Permittee that inspections have historically taken place at a frequency at or greater than the recommended frequency. As an example, the Commenter's attachment provides an example where inspections occurred daily between August 27, 2009 and September 9, 2009.

The 2010 complaint regarding irrigation runoff in Rohnert Park is not the topic of the Proposed Order. However, the Commenter's review does highlight to Regional Water Board staff that there is a need to more closely track recycled water use to better document that it is being applied at agronomic rates and in a manner that does not result in runoff and waste.

TOPIC 6: Water Reclamation System Reporting

Comment No. 6a: There is not enough monitoring to detect runoff events and quantify runoff volumes.

Response: As explained in the response to Comment No. 5, the Proposed Order requires that recycled water users conduct visual monitoring at least monthly.

Comment No. 6b: Use of an objective third-party to conduct inspections is the only way to obtain an accurate assessment of runoff.

Response: The concept of self-monitoring is integral to the water quality protection program in the state of California. Permittees in a broad range of regional water board programs are assigned the responsibility for conducting their own compliance sampling. Falsification of monitoring reports is considered to be a rare but serious infraction and companies and/or persons involved are dealt with severely to the maximum extent allowed by law. It is the position of the State Water Board's Enforcement Policy that such enforcement actions are deterrent enough to protect the overall integrity of the self-monitoring system.

Comment No. 6c: Commenter recommends requirements including: 1) Parcel-specific analysis to determine appropriate recycled water use and maximum allowable volumes, and 2) Prohibitions and restrictions for use of spray irrigation under certain site conditions.

Response: The Proposed Order requires that recycled water users have determined the appropriate application rate, duration, and site specific conditions at each use site so that the application of recycled water for irrigation does not result in runoff. Where there is evidence of runoff that does not meet the definition of incidental, the Regional Water Board will work with the permittee to bring recycled water applications at the site back into compliance, including taking formal enforcement action when appropriate.

Comment No. 6d: Commenter recommends no recycled water irrigation from November to April.

Response: Regional Water Board staff believes that it is unreasonable to prohibit recycled water use from November through April. The Proposed Order allows recycled water application when the application can meet requirements in the Proposed Order, the City's Recycled Water User's Guide, Attachment G, and the Permittee's Non-Storm Water BMP Plan. Application of recycled water during inappropriate times is also limited by Water Reclamation Requirement B.10 (Attachment G), which prohibits the application of recycled water on saturated or frozen ground or during rainfall events such that runoff is induced.

Topic 7: Irrigation Data and Evidence of Excessive Use

Comment No. 7a: The commenter provides examples and an analysis that purports to indicate excessive irrigation at selected recycled water use sites.

Response: Regional Water Board staff will follow up with the Permittee regarding these allegations.

Comment No. 7b: There are contradictions in the permit about reporting of runoff events. In addition, Section X.E.3 of the MRP is confusing and appears to authorize runoff that is not determined to be incidental.

Response: The permit requirement cited (Attachment G, page G-5, section B.12.c) requires correction of leaks within 72 hours, not reporting. Reporting requirements for recycled water runoff are found in section X.E.3 of the MRP (Attachment E). Regional Water Board staff sees no contradiction between reporting requirements.

The Proposed Order includes requirements to minimize or prevent incidental runoff. Runoff that does not meet the definition of incidental is not authorized by the Proposed Order.

Comment No. 7c: The permit does not contain specific information about how runoff is to be prevented.

Response: Best management practices for the prevention of runoff and the protection of domestic water supply and surface water quality are described the City's Recycled Water User's Guide, Attachment G, and the Permittee's Non-Storm Water BMP Plan.

TOPIC 8: Anti-degradation

Comment No. 8: The City's recycled water discharge does not comply with the State anti-degradation Policy.

Response: See staff response to (RRWPC) Comment Nos. 2, 5, 19, and 23 (December 2012).

TOPIC 9: Constituents of Emerging Concern (CECs)

Comment No. 9: RRWPC expresses concern that CECs are not being monitoring in recycled water.

Response: See staff response to (RRWPC) Comment No. 13 (December 2012).

TOPIC 10: Proposed Change in Santa Rosa-Rohnert Park Recycled Water Agreement

Comment No. 10: Will a new agreement between the City of Santa Rosa and the City of Rohnert Park change anything in regards to the permit?

Response: No. The City is responsible to ensure that it and its users comply with terms of the permit.

OTHER TOPICS

Comment No. 11: RRWPC expresses concern about authorizing an expansion of the City's recycled water system until the Laguna Nutrient TMDL and the Salt/Nutrient Management Plans are completed and approved.

Response: See staff responses to Comment Nos. 3, 20, 23, from the December 2012 comment letter.

Comment No. 12: RRWPC requests a public review of the engineering report for the expansion before it is approved by the Regional Water Board Executive Officer.

Response: Under terms of the MOA between the State Water Board and CDPH, the title 22 Engineering Report is reviewed and assessed for completeness and adequacy by CDPH. However, Regional Water Board staff will make the report available for public review prior to its approval by the Executive Officer.

Comment No. 13: RRWPC provides an analysis of irrigation reports from August 27, 2009 to September 9, 2009 to support its argument that irrigation sites need to be more closely monitored and that the permit should be strengthened to do that.

Response: Comment noted.

General Public Comments (John Short – Comment Letter No. 1)

On December 3, 2012, Mr. John Short submitted comments submitted on the draft Order released on October 31, 2012. Comments from Mr. Short are summarized here by Regional Water Board staff. Please refer to the comment letter for the full text of comments.

Comment No. 1: Incomplete List of Beneficial Uses. The permit does not include the more recently adopted beneficial uses contained in a Basin Plan amendment. Several beneficial uses, including wetland habitat, flood attenuation, cultural resource and subsistence fishing should be included.

Response: Wetland Habitat, Flood Attenuation, Native American Culture, and Subsistence Fishing are not designated as beneficial uses specific to the Laguna de Santa Rosa or Santa Rosa Creek, but these water bodies clearly support some of these beneficial uses. Existing beneficial uses for which there is supporting evidence of existing use have been included in the Proposed Order. The Native American Cultural beneficial use is not sufficiently documented at this time to support designation in the draft Order for the Laguna de Santa Rosa and Santa Rosa Creek. See response to Santa Rosa Comment No. 58 from the Permittee's July 2013 comment letter.

Comment No. 2: Use of Outdated Water Quality Criteria for Ammonia. The USEPA has notified the state (see comments on the Sacramento Regional wastewater permit) of new, more protective criteria necessary to protect sensitive aquatic species in freshwater streams. The proposed permit uses scant data and old outdated criteria to determine that no permit limits for ammonia are necessary. This conclusion is reached despite the fact that the Laguna has been previously listed as impaired for ammonia and subsequently delisted without an adequate TMDL and without sufficient data showing the elimination of this pollution. Due to the sensitive nature of the Laguna, the presence of critical endangered species, and the number of other unregulated ammonia discharges in the watershed, I would suggest that numeric ammonia limitations, based on the updated USEPA criteria be included in this permit.

Alternatively, I would ask that any past data be evaluated against the new USEPA criteria to re-evaluate any calculated reasonable potential and the permit changed accordingly, Also, permit references to the old criteria should be revised to use the new criteria or at least to remove reference to old criteria and allow for the generic use of the most up-to-date, scientifically defensible criteria.

Response: A reasonable potential analysis was conducted using available monitoring information from Discharge Location 012B, the only discharge location used by the Permittee during the last permit term. Based on the effluent data at the time the RPA was conducted, there was no potential for the discharge to exceed the numeric water quality criterion recommended by the USEPA. The ammonia criterion in the 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA 822-R-99—014) were used for the RPA because the 1999 criteria were the approved criterion during development of the draft Order. Although new recommended water quality criteria for ammonia were recently published (August 22, 2013), Regional Water Board staff has

determined that there was insufficient time in advance of the permit adoption hearing to appropriately apply the new criteria.

At the time of the development of the NPDES permit for the Sacramento Regional County Sanitation District (NPDES Permit No. CA0077682), the 2013 Criteria Update was not yet approved and was also unavailable for use in the NPDES permit for the City's Subregional System. Its application in the Sacramento Regional permit was prospective to provide clear guidance to Sacramental Regional CSD for the design of its proposed nitrification/denitrification treatment system, a circumstance that is not present in the draft Order for the Santa Rosa Subregional System.

Comment No. 3: Requirements Not Met for Basin Plan Exception for Incidental Runoff. The two primary regulatory mechanisms intended to protect water resources are (1) treatment standards for setting the quality of treated wastewater used for reclamation and (2) criteria to ensure that reclaimed wastewater is applied at "agronomic rates". If these regulatory safeguards are satisfied, the state has the authority to allow some minimal degradation of ground and surface water quality. The Regional Board has also recognized the importance of reclamation discharges and completed a process to provide exemptions for low volume, accidental releases of reclaimed water that may violate Basin Plan discharge prohibitions. In order to obtain a Basin Plan prohibition exemption, a discharger is required to submit a technical report showing irrigation design criteria and application rates along with a plan to inspect and enforce applicable criteria. Santa Rosa has not completed this process.

Response: Exceptions to the Basin Plan's seasonal discharge prohibition are contained in the Basin Plan's Action Plan for Low Threat Discharges and Action Plan for Storm Water Discharges. Both action plans require that a discharger or permittee submit permit application information or, for certain low-threat non-storm water flows (e.g., incidental runoff of recycled water from landscape irrigation), a general management program to eliminate or minimize non-storm water discharges into surface waters. Regional Water Board adoption of the Proposed Order, which includes recycled water management requirements and a directive for the City to implement its Recycled Water User's Guide, satisfies the intent of the Basin Plan requirement to obtain Regional Water Board approval for a recycled water management program.

The Permittee has submitted for approval its Non-Storm Water Discharge Best Management Practices BMP Plan, which complements the Recycled Water User's Guide for control of recycled water use. This document is currently under review by Regional Water Board staff who are working with City staff to improve the document's procedures for tracking and reporting noncompliance with recycled water requirements and to improve enforcement of existing requirements.

Comment No. 4: Existing Reclamation Sites are Treated as Exempt from State Policy. The Permit seemingly creates regulatory standards for reclamation discharges, allows groundwater degradation in certain cases, and dismisses potential permit violations while implying that most existing reclamation sites do not meet the stated standards. Discharges (except from future facilities) would not be expected to meet the minimum criteria in the State Recycled Water Policy, the Basin Plan discharge prohibitions and the state anti-degradation policy. The Board seems to imply that existing reclamation sites are somehow

exempt from state policy and only new facilities must comply with minimum standards. While existing reclamation facilities may be "existing facilities" under CEQA, ongoing discharges from these facilities are new discharges under the state water code which clearly states that no one has an inherent right to pollute.

Response: All uses of reclaimed water must comply with all applicable state regulations. This is clearly stated in section IV.C.1 of the draft Order. There is no distinction made in the Proposed Order between existing and new reclaimed water sites, except regarding the installation of purple pipe and maintenance of minimum separation requirements for potable water mains and recycled water pipelines. However, confusion may have arisen because Attachment G, section IV, appears to make that distinction by requiring technical reports demonstrating compliance with water recycling requirement for future recycled water use sites and only requiring the Permittee to submit a workplan identifying a plan and compliance schedule for existing recycled water use sites. This confusion has been eliminated by a revision of Attachment G that removes the requirement for technical reports.

Comment No. 5: <u>**Anti-degradation.**</u> As reiterated in a recent state court case, all reclamation discharges must be subject to the state's anti-degradation water quality policy. According to the permit, the anti-degradation objective can only be met if reclaimed wastewater meets the minimum criteria detailed in the reclamation requirements including application at agronomic rates. The Regional Water Board must make sure that Santa Rosa complies with the minimum state and regional criteria for wastewater reclamation. In addition, Santa Rosa must formally comply with the Basin Plan process for an exception to the Basin Plan prohibitions before any actual discharge of incidental runoff could be forgiven. Any reclaimed water discharge that does not comply with permit reclamation language, anti-degradation objectives, Basin Plan prohibitions or ground water prohibitions must be considered a violation subject to enforcement.

Response: In response to anti-degradation, see response to Comment No. 22 from RRWPC (December 2012) and response to Comment No. 3, above, which addresses the need for a Basin Plan exception for incidental runoff.

Exception for incidental runoff from reclaimed water is allowed under both the Action Plan for Low Threat Discharges and the Action Plan for Storm Water Discharges (as a non-storm water discharge). Low-threat point source discharges may be permitted to surface waters and may be exempted from the Basin Plan seasonal and year-round point source discharge prohibition and discharge flow limitation, provided that the following conditions are met: (1) the discharges are regulated under a NPDES permit, and (2) BMPs approved by the Regional Water Board are established and implemented to minimize or prohibit discharges.

Comment No. 6: <u>**Special Studies in Previous Permit.**</u> The basic concept of applying reclaimed wastewater only at agronomic rates (based on nutrients and water demands) is not new. This item was discussed during the last renewal of the Santa Rosa permit. Although many members of the public wanted regulatory language to require that all facilities meet the minimum reclamation criteria immediately, the Board decided to allow time for the discharger and staff to evaluate existing reclamation activities. The Board included a reclamation special study requirement in the previous permit to allow for

upgrades to application ces and existing facilities where essary. The currently proposed permit is silent about the previous special study or any improvements to existing reclamation facilities. Instead the permit appears to allow the discharger to submit its own informal schedule for regulatory compliance.

Response: The Permittee's existing permit, Order No. R1-2006-0045, does not include a special reclamation study. Regional Water Board staff requires that all reclamation activities comply with requirements in title 22 and with all water reclamation requirements contained in the Permittee's waste discharge requirements. The requirement in the draft Order for the Permittee to submit a workplan that includes a compliance schedule was removed from the revised draft Order.

Comment No. 7: **Mercury TMDL for the Laguna de Santa Rosa.** The existing 303(d) list identifies that the Laguna is impaired due to mercury. The permit discusses various 303(d) impairments and permit criteria intended to ensure that the discharge will not cause or contribute to this impairment. Unfortunately, the permit is silent on the mercury listing. Santa Rosa's discharge contains mercury, some in the toxic bio-available form, and some as elemental mercury. Some mercury (and other pollutants) may attach to sediment or algae and not be identified in the typical filtered water samples collected for compliance. Because the City discharges mercury and the Laguna is impaired for mercury, any discharge of mercury should be prohibited.

Response: The impairment listing of the Laguna de Santa Rosa for mercury is identified in section III.E, second paragraph of the Fact Sheet. In the following paragraph, it is stated that the mercury TMDL is not yet scheduled.

Effluent monitoring data indicate that Santa Rosa's discharge contains mercury, but at a level below the numeric water quality objective in the California Toxics Rule. The reasonable potential analysis, conducted in accordance with the SIP, found that there was no reasonable potential to exceed the numeric water quality objective. (See Table F-4. Summary of RPA Results) Other information that could be used to make a determination of reasonable potential was considered by Regional Water Board staff, including the fish tissue sampling results on which the mercury listing is based.

Regional Water Board staff has determined that more information is required about the extent of fish tissue contamination, the methylation process in the Laguna, and the contributions of mercury from other sources before additional controls on the discharge of mercury, up to and including a prohibition, are established in the City's NPDES permit. This assessment will occur as part of the mercury TMDL. Until the mercury TMDL is further developed, Regional Water Board staff has determined that weekly effluent monitoring for mercury by the City is appropriate. Additional information on the topic is included in response to Comment No. 13 (J. Short, July 2013).

Comment No. 8: **Sediment Sampling of the Laguna de Santa Rosa is necessary.** Sediment sampling of the Laguna and a study of invertebrate biology is necessary to address this habitat and human health concern from mercury.

Response: Comment noted. Regional Water Board staff expects that sediment sampling will be a component of the source assessment in development of the mercury TMDL for the Laguna de Santa Rosa.

Comment No. 9: **Removal of Effluent Limitations for Nitrate constitutes Backsliding.** The existing Santa Rosa permit contains effluent limits for nitrate intended to protect public health. The proposed permit removes this limitation seemingly in violation of federal anti-backsliding criteria. The permit contains a section to discuss anti-backsliding but does not recognize the nitrate issue. The permit seems to indicate that limited data is available to indicate "reasonable potential" for nitrate. While this explanation may be appropriate for setting new effluent limits it is insufficient to justify the removal of an already established water quality effluent limit. Since Santa Rosa has had discharges exceeding the nitrate limit and it is common knowledge that nitrates in wastewater effluent are a common problem, we do not believe that there is adequate legal justification to remove this previously established limit.

Response: A reasonable potential analysis, based on protocol established for the SIP, was conducted using available monitoring information provided by the Permittee. Based on the monitoring data, there was no potential for the discharge to exceed the most stringent water quality criterion, as described in section IV.3.b the Fact Sheet.

Removal of the limitation is allowable based on new information. The finding citing the legal justification for removal of the nitrate limitation is in section IV.D.1 of the Fact Sheet.

General Public Commen (John Short – Comment Letter No.

On July 22, 2013, Mr. John Short submitted comments on the revised draft Order released on June 20, 2013. His comments are grouped into topics and summarized here by Regional Water Board staff. Please refer to the comment letter for the full text of comments. The following are staff responses to significant comments:

TOPIC 1: Nitrogen Pollution

Comment No. 1: The draft revised permit and TSO would rollback progress on limiting pollution in the Laguna and would conflict with . . . [the] existing TMDL – the existing nitrogen TMDL contains specific load reductions targets for wastewater, storm water and dairies. These specific load reductions were never implemented in any regulatory process. There has been no evaluation to determine if any of the TMDL targets have been met. Allowing a significant new discharge of nitrogen to the Laguna without evaluating compliance with the existing TMDL is inappropriate.

Response: The net load goals for total nitrogen and total ammonia identified in the 1995 TMDL, known as the *Waste Reduction Strategy for the Laguna de Santa Rosa*, are not enforceable because the TMDL lacked a firm compliance date. To remedy this, these goals will be replaced with updated waste load allocations when the updated nutrient TMDL for the Laguna de Santa Rosa is adopted.

The Proposed Order replaces the seasonal mass-based effluent limitation for total nitrogen with a performance-based concentration limitation, expressed as a monthly average. A performance-based effluent limitation will ensure that the Permittee will maintain its existing level of nitrogen removal and prevent water quality degradation while the Permittee reduces or offsets phosphorus discharges.

Comment No. 2: The draft revised permit and TSO would rollback progress on limiting pollution in the Laguna and would conflict with . . . other regulatory programs . . ." including dairies, municipal storm water, and onsite wastewater treatment systems. "It would be inconsistent and unfair to increase nitrogen discharges from the City's wastewater facility while requiring costly nitrogen controls for other dischargers in the watershed.

Response: The effluent limitations for total nitrogen that have been revised in the Proposed Order are performance-based and will not lead to an increase in nitrogen discharges compared to the previous permit. In the absence of a completed nutrient TMDL for the Laguna de Santa Rosa, it is speculative to assume what nitrogen controls will be required by its implementation plan.

Comment No. 3: The draft revised permit and TSO would rollback progress on limiting pollution in the Laguna and would conflict with Regional Board staff technical findings. The [June 14, 2013 Fitzgerald] technical report contained substantial findings to support the existing nitrogen effluent limit (zero-net loading) and does not offer any substantial new information to conclude that discharges of nitrogen from this facility would not cause or contribute to exceedances of water quality standards. In part, the technical memo concludes that excessive nitrogen is a 'causative agent' of an aquatic systems

biostimulatory response. . . .After reviewing 377 data points, sta found that at least 358 are exceeding water quality criteria. . . ."

Response: Regional Water Board staff determined there is no reasonable potential for total nitrogen to cause or contribute to exceedances of the Biostimulatory Substances Water Quality Objective, and the technical memorandum from Rebecca Fitzgerald dated June 14, 2013, does include new information to support this determination. However, staff recognizes that the link between the memorandum's evaluation of total nitrogen data, the discussion of phosphorus as the limiting nutrient, and the interpretation of the objective was not as linear as it could have been. A revised memorandum was issued on October 22, 2013 (see Attachment to Executive Officer's Summary Report), to provide additional clarification in response to this and other comments.

In order to interpret the narrative Biostimulatory Substances Water Quality Objective, staff evaluates available data and information under three distinct categories: biostimulatory stressors, indicators of a biostimulatory response, and stressor-response relationships. Biostimulatory stressors (or causal factors) include, but are not limited to: concentrations of total nitrogen and total phosphorus, water temperatures, riparian cover, channel geometry, and stream flows. Response indicators include, but are not limited to: concentrations of dissolved oxygen and chlorophyll a (a measure of algal biomass), pH levels, and other observable phenomena such as macrophytes and algae blooms, and changes in the species composition of plant and animal communities that occupy the water body. The Revised Fitzgerald Memorandum identifies recommended numeric criteria or objectives for both stressors and response indicators, and also compares available data to those criteria or objectives.

Where sufficient site-specific data are available, staff use a combination of research, analysis, and/or modeling to characterize relationships between biostimulatory stressors and observed responses, and if possible, to determine which stressors cause (or control) those responses in a particular water body. As described in the Revised Fitzgerald Memorandum, data and information available for the mainstem Laguna and lower Mark West Creek indicate that, based on current conditions, phosphorus is the primary nutrient stressor that limits algal and macrophytic biomass production, and thus causes harmful biostimulatory responses such as decreases in dissolved oxygen levels. Reductions in nitrogen loads beyond current levels are not expected to result in added protections of the beneficial uses, or significant water quality improvements.

Comment No. 4: The draft revised permit and TSO would rollback progress on limiting pollution in the Laguna and would "conflict with . . . permitting history – the existing permit contains conservative pollutant limits for nutrients."

Response: The change in the effluent limitation of nitrogen from no net loading to a performance-based concentration limitation was as a result of new information that is described at length in the Fact Sheet. Less stringent permit requirements in renewed NPDES permits are permissible where there are findings made in accordance with 40 CFR 122.44(l). Regional Water Board staff found that a relaxation of the final limitation for nitrogen was allowable based on new information.

Comment No. 5: While preliminary discussions regarding eventual TMDL strategies point toward phosphorous as the 'limiting nutrient,' much work remains to be completed. The TMDL will require detailed scientific peer review as well as formal review by technical experts from USEPA and the SWRCB.

Response: While the TMDL will undergo scientific peer review and consideration by the State Water Board and the USEPA, staff is confident in the data, the cited and relied upon published literature, and conclusions that are presented in the technical memo, including those related to phosphorus as the limiting nutrient. The data were appropriately referenced and made available in the draft Order.

Comment No. 6: "Even if technical experts agree that phosphorous is the 'limiting nutrient,' that does not mean that limits for other nutrients are not needed, particularly where ambient nitrogen levels exceed water quality standards. Indeed, waterbodies with nutrient biostimulatory pollution commonly have a single nutrient that is most limiting. That does not mean that other nutrients should not also be controlled."

Response: Staff determined that reducing total nitrogen below current levels will not result in any improvement in the biostimulatory response seen in the Laguna de Santa Rosa and lower Mark West Creek. Please refer to the response to Comment No. 3. Since a water quality benefit to biostimulatory responses from further reductions in total nitrogen is not expected, it is unnecessary to require a no net loading limitation for total nitrogen at this time.

Comment No. 7: Discharges of nitrogen permitted under this permit will violate receiving water limitations for biostimulatory substances and the State Anti-degradation Policy.

Response: For discussion of the reasonable potential analysis for nitrogen to exceed the narrative water quality objective, see response to Comment No. 3, above, and the Fact Sheet. The performance-based limitation for nitrogen is established in the Proposed Order to comply with anti-degradation requirements.

Comment No. 8: Instead of relaxing and/or granting additional time to comply with effluent limitations for nitrogen and phosphorus, a better approach would be for the City should consider small-scale nutrient offset projects with broad public support that will set the stage for future watershed-wide TMDL efforts.

Response: Regional Water Board staff is in active discussions with the Permittee related to the development of a wide range of potential offset projects.

Comment No. 9: There is no information in the permit package to conclude that the additional discharge of 42,000 pounds per year of nitrogen would be protective of water quality.

Response: This proposed seasonal discharge limitation has been replaced with a concentration-based limitation that is based on the Permittee's recent treatment performance. Regional Water Board staff expects that discharges containing nitrogen at this existing performance level will not cause degradation of existing water quality.

Comment No. 10: If the Regional Water Board decides to grant additional time to comply with effluent limitations, the City should be required to conduct small scale pollution education projects, provide BMP installation grants, and fund restoration projects from the Laguna watershed management plan for each year of deferred compliance.

Response: Regional Water Board staff expects that any additional time granted under terms of a TSO will be used by the Permittee to develop nutrient offset projects that will reduce phosphorus loading to the Laguna de Santa Rosa prior to implementation of the nutrient TMDL and that will improve habitat and ecosystem conditions in the long-term.

Comment No. 11: The City should fund a watershed advocate whose mission would be to educate residents about the problems in the Laguna.

Response: Comment noted.

TOPIC 2: Mercury Pollution

Comment No. 12: Subsistence fishing and cultural uses of the Laguna by Native Americans are current beneficial uses that are severely threatened by mercury bioaccumulation.

Response: The presence and extent of the beneficial uses and the threat to them from mercury contamination of fish tissue is not yet fully understood. Regional Water Board staff anticipates that these relationships will be better understood as a result of the mercury TMDL for the Laguna de Santa Rosa and appropriate actions will occur at that time. See also response to Comment No. 1 from John Short's December 2012 comment letter.

Comment No. 13: It is crucial that the Regional Board start mercury monitoring and assessment activities as soon as possible. The bioaccumulation of mercury threatens endangered salmonids as well as all other aquatic species in the Laguna. Protection of public health, particularly seasonal workers, the homeless and Native Americans living adjacent to the Laguna, is an urgent issue (with associated concerns for environmental justice) that should not be ignored.

Response: Regarding effluent limits:

Regional Water Board staff has determined that effluent limits for mercury are not required because there is no reasonable potential for the discharge of mercury from the Laguna Wastewater Treatment Facility to exceed the most stringent water quality objective or water quality criterion of 0.050 ug/L. For total mercury, the maximum effluent concentration measured was 0.00276 ug/L from discharge points 006A, 006B, and 015, and 0.00164 ug/L from discharge points 012A and 012B.

The regional and state water boards are currently developing a Statewide Mercury Program to restore and improve the chemical, physical, and biological integrity of our waters by reducing levels of mercury in order to support beneficial uses such as fish consumption and wildlife protection. Options for the Statewide Mercury Program include the establishment of new water quality objectives for methylmercury in fish

tissue and implementation actions for NPDES facilities. Entities responsible for NPDES facilities could be required to monitor mercury in discharges. The Permittee is already monitoring weekly for total mercury in its discharge. Under the Statewide Mercury Program, it is also possible that NPDES facilities could be subject to WQBELs, which could be derived using performance-based limits or derived from the fish tissue methylmercury objective (which could be converted to aqueous total mercury concentrations using bioaccumulation factors and translators). Until the Statewide Mercury Program is adopted and takes effect, Regional Water Board staff is relying upon the findings of the reasonable potential analysis mentioned above.

Regarding monitoring and special study requirements:

In this instance, Regional Water Board staff maintain that it is not appropriate for one discharger of mercury to be responsible for assessing other sources of mercury in the watershed. There is a lack of a nexus between the discharge of mercury from the Laguna Wastewater Treatment Facility and other potential sources of mercury in the watershed, which likely include the erosion of soil with naturally high levels of mercury, atmospheric deposition, and storm water runoff from urban areas. Mercury mines can also be a source, although staff is not currently aware of any mercury mines within the Laguna de Santa Rosa watershed.

Coast Action Group (CAG)

Comment No. 1: **Removal of Effluent Limitations for Nitrate constitutes Backsliding.** CAG supports continuing the objective of Zero Net Discharge of nutrients as part of this permit. This is an important facet of controlling nutrient inputs that are an issue in the Laguna de Santa Rosa.

Response: Comment Noted. Also see response to Comment No. 9 from John Short's December 2012 comment letter.

Comment No. 2: **Monitoring of Effluent Discharges and Groundwater for Nutrients and other Chemicals.** There should be a robust monitoring program in place to assess issues of effects of nutrient discharges in the Laguna. Since the permit allows for distribution of tertiary wastewater there should also be in place monitoring for nutrient effects from same as well as monitoring for effects of chemicals known to exist in waste water that may make their way into ground and surface waters.

Response: The Proposed Order requires weekly monitoring of phosphorus and nitrogen compounds for treated effluent discharged to surface waters and monthly monitoring of recycled water for nitrogen compounds. Receiving waters are required to be monitored monthly for phosphorus and nitrogen compounds when there is a surface water discharge.

The Recycled Water Policy states that the appropriate way to address salt and nutrient issues arising from water reclamation was through SNMPs rather than imposing requirements on individual recycled water projects. Accordingly, groundwater monitoring proximate to individual recycled water sites is not prescribed in the Proposed Order.

Comment No. 3: **Fertilizer Use on Irrigated Lands Exacerbates Nutrient Pollution in Laguna and Violates Anti-degradation Policy.** When runoff occurs, which happens frequently, it not only carries with it the herbicides, pesticides, and fertilizers, etc. that are applied to the land prior to irrigation with wastewater, but also exacerbates nutrient pollution in the Laguna and Russian River. This violates anti-degradation requirements and more serious measures should be in place to assure it will not happen. This NPDES permit and reclamation plan must demonstrate how anti-degradation requirements are met.

Response: Water recycling requirements in the Proposed Order are consistent with the State's Recycled Water Policy. See response to (RRWPC) Comment No. 2 and elsewhere. As described in the Recycled Water Policy, a water recycling project may be approved without further anti-degradation analysis if the project meets criteria for a streamlined irrigation permit, which includes appropriate consideration and use of fertilizer at water use sites.

Comment No. 4: **Phosphorus Limitations and Monitoring.** The City should be required to meet phosphorus limits in addition to nitrogen limits; agronomic rates should be

adjusted daily; irrigation uld take place when plants are mo n need of water (not in middle of night), and monitoring of pesticides and other toxins should be monitored (especially most common and dangerous ones) monthly.

Response: The Proposed Order includes a narrative (BMP-based) effluent limitation for total phosphorus, expressed as not net loading. An explanation of the rationale for this effluent limitation is provided in the Fact Sheet and in the response to the Permittee's Comment No. 1 from its July 2013 comment letter.

Nutrient levels in the City's highly treated recycled water are consistently low, approximately 9 mg/L total nitrogen and 2 mg/L total phosphorus, and contribute no more than 35 percent of nutrient needs for turfgrass, according to the Permittee. Consequently, nutrient applied through irrigation of recycled water is not considered by Regional Water Board staff to create a significant potential for impacts to groundwater quality. Numeric reclamation limitations for nitrogen and phosphorus for recycled water are unnecessary.

Irrigated lands accept and absorb applied water both at all times during the day. Irrigation during non-daylight hours promotes more efficient water use by reducing wind drift and evaporation and reduces the opportunity for direct public exposure to recycled water.

Priority pollutants, which include pesticides and other chemicals that pose a threat to aquatic life and human health, have been monitored in the City's treated effluent at least quarterly for many years. Monitoring results have demonstrated that the City's treated effluent, much of which is delivered to the recycled water system, is relatively free of harmful levels of priority pollutants. Regional Water Board staff has determined that quarterly monitoring for priority pollutants is appropriate based on previous monitoring results.

Comment No. 5: **Phosphorus Limitations and Monitoring.** The Anti-degradation Policy and BMPs should be in place to protect ground and surface waters from potential effects of recycled water distribution.

Response: Minimum BMPs are listed in Attachment G, section B.12. In addition, the City Recycled Water User's Guide contains management practices and design guidelines for recycled water projects to protect groundwater and surface water.

Comment No. 6: Phosphorus Limitations and Monitoring. A letter from CAG to the SWRCB on Recycled Water Policy is included to define our concern regarding the use of recycled water for irrigation.

Response: Comment Noted.

Russian River Watershed Association (RRWA)

Comments from the RRWA are summarized here by Regional Water Board staff. Please refer to the comment letter for the full text of comments.

Comment No. 1: **New Water Recycling Requirements.** New Recycled Water Requirements are overly burdensome without identifiable benefit.

Response: See Response to Comment No. 3 from the City of Santa Rosa.

Comment No. 2: **Quarterly Meeting with Site Supervisors is Infeasible.** Requirement to meet quarterly with site supervisors is infeasible given the size of the City's reclamation system and a disincentive for expansion of the system.

Response: This requirement was removed from the Proposed Order.

Comment No. 3: **Support for City of Santa Rosa.** RRWA supports the City of Santa Rosa's recommended changes.

Response: Comment noted.

Northern California River Watch – Comment Letter No. 1

Northern California River Watch submitted comments on December 7, 2012, after the close of the comment period. Comments from River Watch are summarized here by Regional Water Board staff. Please refer to the comment letter for the full text of comments.

Comment No. 1: The Permit Should Include a 100 foot Setback from Waterways for Spray Irrigation Application and Requirement for Drip Irrigation for Median Strips. Irrigation spray can project wastewater containing unregulated chemicals (including endocrine disrupting chemicals and pharmaceuticals) through the air, thereby expediting human contact and water contamination. We request that all current and future spray irrigation take place at least 100' from waterways unless preferred drip irrigation is used. Median strips should only be drip irrigated.

Response: See responses to RRWPC related to threats posed by over-irrigation. The request for the draft Order to include minimum setbacks is responded to in response to (RRWPC) Comment Nos. 21 and 26.

Comment No. 2: Fertilizer Use on Irrigated Lands Exacerbates Nutrient Pollution in Laguna and Violates Anti-degradation Policy. Concerned with all pesticide application residues and byproducts and their accumulative potential. When runoff occurs, which happens frequently, it not only carries with it the herbicides, pesticides (such as 1,3-Dichloropropene, Glyphosate, and Mancozeb), and fertilizers, etc. that are applied to the land prior to irrigation with wastewater, but also exacerbates nutrient pollution in the Laguna and Russian River. This violates anti-degradation requirements and more serious measures should be in place to assure it will not happen. Santa Rosa should be required to meet Phosphorus limits in addition to Nitrogen limits; agronomic rates should be adjusted daily; irrigation should take place when plants are most in need of water (not in middle of night), and monitoring of pesticides and other toxins should be monitored (especially most common and dangerous ones) monthly.

Response: See response to RRWPC Comment No. 2 for response to questions regarding fertilizer use. See response to RRWPC Comment Nos. 19 and 26 regarding compliance with the State Anti-degradation Policy for recycled water.

Comment No. 3: Monitoring for Estrogen and chemotherapy Drugs. We are concerned about the adequacy of monitoring of the above pollutants, especially estrogen (17B-estradiol), which should be regularly monitored in the wastewater used for irrigation. We also support fish tissue samples from Laguna fish living full time in highly impaired waterway. Chemo drugs are another concern and should be tracked.

Response: See response to (RRWPC) Comment No. 13.

Northern California River Watch – Comment Letter No. 2

On July 22, 2013, Northern California River Watch submitted comments on revised draft Order released on June 20, 2013. Comments from River Watch are summarized here by Regional Water Board staff. Please refer to the comment letter for the full text of comments.

Comment No. 1: River Watch incorporates by reference comments from other parties related to the failure to comply with anti-degradation requirements, undermining of the 1995 TMDL requirements, violation of anti-backsliding regulations for relaxation of nitrogen limitations, the lack of BMPs for irrigation, and the failure to incorporate proper effluent controls for mercury.

Response: For Regional Water Board staff responses regarding anti-backsliding and antidegradation considerations due to relaxation of effluent limitations for nitrogen in the Proposed Order see responses to the July 2013 comments from John Short ("Topic 1 – Nitrogen Pollution"). Staff responses to anti-degradation concerns expressed by RRWPC are provided in response to the December 2012 comment letter (Comment Nos. 2, 5, 19, 22, 23). Staff responses to comments regarding the need for BMPs for irrigation of recycled water is provided throughout the staff response to RRWPC. For responses to comments regarding mercury, see Staff responses to the July 2013 from John Short ("Topic 2 – Mercury Pollution").

In addition, a discussion of compliance with anti-backsliding requirements for nitrogen limitations is discussed in the permit Fact Sheet.

Comment No. 2: the Draft Permit fails to indicate compliance with effluent limitations set forth in the California Toxics Rule (40 CFR Part 136) as well as other limitations, such as for temperature, set forth in the previous permit.

Response: Regional Water Board staff does not understand this comment. Water quality-based effluent limits for priority pollutants listed in the CTR are established in the Proposed Order where Regional Water Board staff has determined that pollutants are discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above a water quality criterion, in accordance with the SIP. The City complies with receiving water limitations for temperature in accordance with its Receiving Water Monitoring Plan, as described in the ROWD and the Proposed Order.

General Public Comme (Comment Form Letter No. 1)

Approximately forty form letters were submitted by post or email during the comment period that closed on December 4, 2012. Comments from this letter are summarized here by Regional Water Board staff. Please refer to the comment letter (typical) for the full text of comments.

Comment No. 1: The Permit Should Include a 100 foot Setback from Waterways for Spray Irrigation Application and Requirement for Drip Irrigation for Median Strips. Irrigation spray can project wastewater containing unregulated chemicals (including endocrine disrupting chemicals and pharmaceuticals) through the air, thereby expediting human contact and water contamination. We request that all current and future spray irrigation take place at least 100' from waterways unless preferred drip irrigation is used. Median strips should only be drip irrigated.

Response: See responses to RRWPC related to threats posed by over-irrigation. The request for the draft Order to include minimum setbacks is responded to in response to (RRWPC) Comment Nos. 21 and 26.

Comment No. 2: Fertilizer Use on Irrigated Lands Exacerbates Nutrient Pollution in Laguna and Violates Anti-degradation Policy. Concerned with all pesticide application residues and byproducts and their accumulative potential. When runoff occurs, which happens frequently, it not only carries with it the herbicides, pesticides (such as 1,3-Dichloropropene, Glyphosate, and Mancozeb), and fertilizers, etc. that are applied to the land prior to irrigation with wastewater, but also exacerbates nutrient pollution in the Laguna and Russian River. This violates anti-degradation requirements and more serious measures should be in place to assure it will not happen. Santa Rosa should be required to meet Phosphorus limits in addition to Nitrogen limits; agronomic rates should be adjusted daily; irrigation should take place when plants are most in need of water (not in middle of night), and monitoring of pesticides and other toxins should be monitored (especially most common and dangerous ones) monthly.

Response: See response to RRWPC Comment No. 2 for response to questions regarding fertilizer use. See response to RRWPC Comment Nos. 19 and 26 regarding compliance with the State Anti-degradation Policy for recycled water.

Comment No. 3: Monitoring for Estrogen and chemotherapy Drugs. We are concerned about the adequacy of monitoring of the above pollutants, especially estrogen (17B-estradiol), which should be regularly monitored in the wastewater used for irrigation. We also support fish tissue samples from Laguna fish living full time in highly impaired waterway. Chemo drugs are another concern and should be tracked.

Response: See response to (RRWPC) Comment No. 13.

Comment No. 4: Ponding of Recycled Water. Ponding is a sign of over-irrigation and should only be allowed for brief amounts of time, such as one hour, but not 24 hours as allowed in the draft Order.

Response: See response to (RRWPC) Comment No. 5.

EXHIBIT B

EXHIBIT B – CITY OF SANTA ROSA PETITION FOR REVIEW

In response to the draft NPDES permit, the City of Santa Rosa submitted a Comment Letter dated July 22, 2013. This Comment Letter stated that water travel times in the Laguna de Santa Rosa during periods of discharge of the City's recycled water are sufficiently short such that anysoluble phosphorus discharged does not reside in the Laguna long enough for that phosphorus to adsorb to suspended sediment and sink to the bottom. For this reason, the City asserted that its minimal discharges do not add to or exacerbate existing biostimulatory conditions likely due to other sources or conditions. In its response to comments, the Regional Water Board disagreed, asserting that water travel times predicted by the City's hydrologic model are likely underestimated due to selected model parameter values, simplified channel representation, chosen design flows, and the model's limited ability to simulate reverse flow conditions. As discussed below, the City disagrees with the Regional Water Board's response, and continues to assert that short-term flow reversals in the Laguna are insufficient in duration to truly affect upstream advection of discharged recycled water so as to provide for adsorption and settling of a mass of phosphorus that would influence biostimulatory conditions.

This document contains the Regional Water Board's response to this comment (in italics) as well as the City's rebuttal to the Regional Water Board's response in regular font.

Comment 1F: The City's discharges of phosphorus do not pose a threat to water quality in the Laguna because of short water travel times. The City claims that water travel times between the City's point of discharge at Delta Pond and the Laguna's confluence with the Russian River are relatively short (i.e., never greater than 7 hours) during periods when the City is most likely to discharge. As such, the City claims that its discharges of soluble phosphorus to the Laguna are not in the system long enough to be captured via sorption processes, and thus will not add to existing biostimulatory conditions.

Response: Staff disagrees with City's claims regarding water travel times for reasons described below.

The City's estimates of water travel times are based on simulations using a hydrologic model (as described in Attachment 3 to the City's comment letter). The model was originally developed to investigate the water quality impacts of potential future scenarios for discharges by the City of Santa Rosa into the Russian River and Laguna de Santa Rosa at various locations. Based on staff's review of Attachment 3 to the City's comment letter (and works cited therein), water travel times predicted by the City's hydrologic model are likely underestimated, due to selected model parameter values, simplified channel representation, chosen design flows, and the model's limited ability to simulate reverse flow conditions. Specifically:

- *Model simulations were performed using an assumed Manning's roughness coefficient of 0.040 along the entire length of the modeled Laguna reach. According to Chow (1959), this value represents clean, winding, natural streams with some pools and shoals. Actual channel conditions in the Laguna are more complex than this description suggests, and would be better represented by a higher value. For example, a Manning's roughness coefficient of*

0.070 represents a natural channel with sluggish reaches, weeds and deep pools. In this case, the low roughness coefficient used in the City's model simulations likely leads to underestimated water travel times for the Laguna.

City Rebuttal: While Manning roughness coefficients may vary among channel types, roughness also varies with depth as roughness elements under certain low flow and depth conditions diminish in importance with higher flows (Henderson 1966). The City discharges largely during higher flow events, when, incidentally, vegetation growth is at an annual minimum and other channel roughness factors are much less important. Further, as Chow (1959) notes, the Manning equation is actually applicable for uniform flow (*i.e.*, normal depth), a condition that is not only highly variable in natural systems, but also transient. However, as outlined in Chow (1959) and Henderson (1966), utilization of Manning roughness (or Chézy coefficient) is an approximation that provides a useful means to solve practical problems. Thus, selecting a Manning coefficient that approximately reproduced water surface elevations during calibration was deemed appropriate for the numerical model.

- *The City's model assumes that the Laguna de Santa Rosa has a trapezoidal channel shape, a fixed width of 5 meters, and side slopes that may vary, but remain fixed along 200 meter stream segments. The modeled reach begins upstream at Stony Point Road, and ends at the Laguna's confluence with the Russian River.*

  While the model allows for channel constrictions to be represented in 200 meter segments, it does not allow for abrupt constrictions to be considered, such as those caused by bridges in several locations downstream of the City's discharge point at Delta Pond (such as at Guerneville Road, River Road, and Trenton Healdsburg Road). Abrupt channel constrictions cause velocities in the Laguna to slow considerably during high flow events, as flood waters pool behind the bridge abutments and piers. In this case, the simplified representation of channel structure used in the City's model simulations leads to underestimated water travel times for the Laguna.

City Rebuttal: Such channel constrictions occur predominantly at low flows, such as those that occur during non-discharge periods. However, during higher flow events, the lack of local topography in the Laguna provides access to secondary channels and the floodplain. For larger flow events that exist when the City's discharge occurs, such natural channel constrictions would have little impact. Model side slopes (run over rise) range from less than 3:1 in the lower reaches of Mark West Creek where the channel is confined to over 27:1 in the Laguna proper. Geometric representation was based on previous modeling efforts accepted by the Regional Water Board (Smith, 1996), floodplain mapping, measured cross sections at selected locations, and review of aerial photos. At flows of 150 cfs, depths in the Laguna are on the order of 3.5 feet, translating to maximum and minimum widths of approximately 100 feet and 35 feet, respectively, and median widths of approximately 50 feet. At higher flows, when City discharges could occur, widths would be larger. The bridge constrictions are nominally included in the model, but bridge openings are necessarily wide in the Laguna, with Guerneville Road spanning over 300 feet, and Occidental and Highway 12 spanning over 200 feet. While a simplification of the complex geometry was an element of model representation, overall representation of the Laguna was effectively captured in the RMA modeling suite. The numerical hydrodynamic model (not a

hydrologic model, as incorrectly asserted by RWQCB staff) was used under an array of conditions to test the model and represents the best available tool to make estimates of travel time.

- *In the City's modeled assessment of water travel times, the wettest design flow simulated for the Laguna at its confluence with the Russian River is 2,300 cubic feet per second (cfs), which the City lists as having a 1 percent probability of exceedence (i.e., the 100-yr flow event). However, available stream flow data from the United States Geological Survey (USGS) indicate that 2,300 cfs is regularly exceeded at this location (specifically, lower Mark West Creek at Trenton-Healdsburg Road, USGS Gage No.11466800). In fact, approximately 22 separate events have occurred within the last 5 years of recent record, during which stream flows have exceeded the City's maximum design event.[1] In this case, low design flows used in the City's model simulations leads to unknown, but likely substantial effects on the City's estimates of water travel times for the Laguna.*

City Rebuttal: The simulations presented in the Attachment 3 were based on IRWP water balance year types and daily flows. Daily average flows do not represent 15 minute maxima that the USGS data cited by RWQCB staff present. Review of the record indicates that the Laguna is quite "flashy." Examining data from 2008-13 (last 5 years), suggest that peak flows are approximately 130% to over 1000% of daily average flows. Daily average values are approximately 55% of the peak daily averages for these years. Using this as an estimate suggests that peak flows identified in Attachment 3 of 2,300 cfs would equate to 4,182 cfs – a value consistent with all but one higher peak flow in the 15 minute USGS 15 minute record. While daily average flows do not represent peak conditions, review of the USGS basin supports the flashy nature of the Laguna (*i.e.*, peak flows are 130% to over 1000% of daily average flows), typically lasting only a few hours. Travel times calculated based on daily average conditions represent an average travel time (slightly shorter for part of the day and slightly longer for part of the day), and are representative for the purposes of evaluating the impact of the City's discharge of phosphorus on water quality at locations upstream of the discharge point.

- *According to the City, the model used to assess water travel times in the Laguna identified no backflow conditions (i.e., when the direction of flow is reversed) for any of the five simulated design events. However, available USGS stream flow data indicate reverse flows in the mainstem Laguna have occurred during at least four separate storm events since 2009, as measured upstream of the City's Delta Pond discharge point (USGS Gage No. 11465750 at Occidental Road)[2]. In this case, the model's apparent inability to simulate reverse-flow conditions known to occur in the Laguna mainstem leads to underestimated water travel times.*

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[1] Complete daily stream flow records are available at the referenced gage for the following hydrologic years: 2006, 2007, 2008, 2012, and 2013. No City discharges to surface waters occurred in the 2007/2008 or 2012/2013 discharge seasons that could be subject to reverse flows, and discharge occurred for 5 hours in the 2011/2012 discharge season.

[2] The four events occurred on the following dates: Feb. 22, 2009; Jan. 18, 2010, Mar. 13, 2012, Dec 21, 2012.

City Rebuttal: The simulations presented in the Attachment 3 were based on IRWP water balance year types and daily flows. Daily flows modelled by the City mask reverse flows in the Laguna because these events are short lived, typically lasting less than a few hours. However, cases exist where these events may last over 12 hours. For those days when reverse flows last a few hours, the average daily flow remains positive (net outflow). The daily flows used in the simulation provided do not capture reverse flows because sub-daily peak flows in the flashy Laguna hydrology are not represented. The model does capture reverse flows – on the order of a few hours – in certain calibration years when hourly data are applied. Hourly data (and USGS sub-daily data) were not available for the five water balance year types used in the planning level studies. The finite element hydrodynamic model has the capability of simulating a wide range of hydrologic conditions, including advection and attenuation of flood waves, backwater and reverse flow conditions, dynamic hydrologic conditions, as well as steady flows. Specifically, RMA-2 employs the full form of the St. Venant equation representing both conservation of mass and momentum. The model is fully capable of simulating reverse flow; however, the daily averaging of inflows limited the results of the 5 year types to positive downstream flows. Short-term flow reversals are insufficient in duration to affect upstream advection of discharged recycled water to provide for adsorption and settling of a significant mass of phosphorus of recycled water origin based on the adsorption kinetics described in the City's Comment Letter dated July 22, 2013.

References Cited:

Chow, V.T. 1959. Open-Channel Hydraulics. McGraw-Hill Book Company, New York, NY.

Henderson, F.M. 1966. Open Channel Flow. MacMillan Publishing Co., Inc. New York. 522pp.

Smith, D.J. 1996. Water Quality and Flow Model for Irrigation/Storage Area Streams. Resource Management Associates for the City of Santa Rosa