COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

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GRACE ROBINSON HYDE
Chief Engineer and General Manager

July 10, 2017
File No. 31-370.40.4A

Via Electronic Mail

Mr. Nicholas Martorano
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Dear Mr. Martorano:

Comments on the Proposed 2016 Los Angeles Region
Clean Water Act Section 303(d) List of Impaired Waters

The Sanitation Districts of Los Angeles County (Sanitation Districts) appreciate the opportunity to comment on the proposed 2016 Los Angeles Region Clean Water Act Section 303(d) List of Impaired Waters (Draft List). The Sanitation Districts are a consortium of 24 independent special districts serving the wastewater and solid waste management needs of over five million people and 3,300 industries in Los Angeles County, California. The Sanitation Districts currently operate and maintain over 1,400 miles of trunk sewers and 11 wastewater treatment plants that collectively treat over 450 million gallons per day of wastewater. Of the 11 wastewater treatment plants, nine are located in the Los Angeles Region. Seven of the these treatment plants discharge to inland surface waters in the San Gabriel River, Santa Clara River, and Rio Hondo watersheds; one discharges to the Pacific Ocean; and one does not discharge to surface waters but instead solely supplies recycled water for irrigation.

The Sanitation Districts commend State Water Resources Control Board (State Board) staff for their diligent implementation of the State Board's Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy) to produce a Draft List that is generally well-documented and scientifically valid. In addition, the Sanitation Districts greatly appreciate the efforts to make the listing process more transparent, particularly by making the data used to assess listings available and by producing clear fact sheets on each water body/pollutant combination. Additionally, we greatly appreciated the efforts of State Board Staff in meeting with us and addressing questions regarding the Draft List. Their involvement and assistance during the preparation of these comments was extremely helpful.

However, the Sanitation Districts still have remaining concerns on some aspects of the Draft List, particularly where the listing thresholds used in the Staff Report appear to differ from receiving water quality objectives contained in the Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) or other regulatory programs. General comments relating to these concerns are provided below and detailed specific comments for each listing are provided in Attachment.

1. The Draft List Includes Inappropriate Impairment Listings for "Benthic-Macroinvertebrate Bioassessments"

The Draft June 2017 version of the 2016 303(d) List contains a number of newly proposed listings for "Benthic-Macroinvertebrate Bioassessments." The proposed listings are based on application of the Southern California Coastal Index of Biological Integrity (SCIBI) and, in some cases, the California Stream Condition Index (CSCI). These include listings for Santa Clara River Reaches 5 and 6 and Medea Creek Reach 1. The Sanitation Districts believe these proposed listings should be removed, for the reasons listed below.

> Listings Based on the SCIBI and CSCI Are Inconsistent With State Policy.
> The Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy) indicates that water bodies should only be listed for degradation of biological populations if they have significant degradation **relative to reference sites** [emphasis added]. Although the scientists that developed the SCIBI attempted to incorporate reference conditions into the index itself, the reference conditions used to develop the index did not include sufficient low elevation, low gradient locations similar to the Santa Clara River reaches of concern.[1] Although the CSCI at least partially addresses some of the problems with the SCIBI by employing a modeled reference condition as opposed to the regional reference pool used by the SCIBI, a lack of reference sites in large watersheds, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI.
>
> Section 6.1.5.8 of the Listing Policy also states that when "evaluating biological data and information, RWQCBs shall evaluate all readily available data and information and **shall**...**evaluate physical habitat data** and other water quality data, when available, to support conclusions about the status of the water segment." [Emphasis added.] All of the reaches mentioned in this comment letter represent reaches that have undergone various levels of physical habitat modifications and there is no indication that an evaluation of the physical habitat was conducted. It is well recognized by the scientific community that unmanageable non-pollutant physical habitat alterations would preclude many California streams from ever having biological assemblages similar to reference. The threshold used as the listing criterion for these reaches is therefore likely inappropriate for these modified waterbodies.

The Sanitation Districts believe that it is inappropriate to make impairment decisions using the SCIBI and premature to rely on the improved, but still limited CSCI for making impairment decisions, particularly in reaches where surrounding development and instream physical habitat limitations are recognized and/or in large watersheds, low gradient, low elevation systems. Therefore, the Sanitation Districts respectfully recommend that the Regional Board delay making decisions regarding these benthic macroinvertebrate community impairments in this listing cycle or place these water bodies in Category 3, and instead continue to work with stakeholders, scientists, and the State Board that are currently engaged in efforts to address these and other issues as part of the Biointegrity/Bio-stimulatory Policy.

2. The Draft List Includes Inappropriate Impairment Listings for Temperature

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[1] Ode, P.R., A.C. Rehn, J.T. May. 2005. A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management Vol. 35, No 4, pp. 493-504.

The Draft List contains a number of newly proposed listings for temperature. The Sanitation Districts believe the proposed temperature listings for San Gabriel River Reach 2, San Jose Creek Reach 1, San Gabriel River Reach 1, and Santa Clara Reach 6 should be removed because the impairment listings are inconsistent with the Basin Plan water quality objective for temperature, which states, "at no time shall these WARM-designated waters be raised above 80°F **as a result of waste discharges.**" [Emphasis added.] This water quality objective clearly distinguishes between exceedance of the 80°F standard caused by "waste discharges" and those associated with other causes. The wording of this Basin Plan objective places the burden of proof on the Water Boards to demonstrate that waste discharges are causing the elevated temperatures. The Draft List does not contain any analysis or evidence indicating that the elevated temperatures occurred as result of wastes discharged, as opposed to other factors. Rather, the Response to Comments on the Draft 2016 303(d) List prepared by the Regional Board specifically states that such analyses were not conducted. In this same document the Regional Board also acknowledged other sources of temperature exceedances, stating, "Exceedances in temperature may be caused in part by ambient temperatures or exacerbated by the lack of tree cover in some reaches; exceedances may also be caused in part by waste discharge." Furthermore, evidence indicates that summertime excursions greater than the 80°F in these reaches are not caused by wastes discharged but are likely due to elevated ambient air temperature, conductive and radiative heating associated with hardened landscapes, a lack of riparian cover, and increased ambient temperatures related to climate change.

Additionally, the Sanitation Districts believe that the proposed temperature listing for Santa Clara River Reach 6 is particularly inappropriate. Measurements for this listing were taken immediately downstream of the Saugus Water Reclamation Plant (WRP), where tertiary treated effluent is discharged along one bank of the Santa Clara River bed. The flow remains isolated from the main channel of the Santa Clara River and percolates rapidly into the soil; groundwater resurfaces downstream near Reach 5 of the Santa Clara River. The predominant natural condition of this stretch of river is dry and would not be expected to support aquatic life without the Saugus WRP discharge; therefore, application of the 80°F water quality objective is unnecessary and inappropriate. Upon resurfacing near Reach 5, the water temperature averages 69°F, demonstrating that elevated temperatures in this isolated discharge area are not detrimental to beneficial uses in reaches where water occurs naturally in the river. Finally, elevated ambient temperatures regularly exceed 90 °F during the summer months, and heavily influence both the Saugus WRP discharge and the immediate downstream receiving water location.

3. Specific Comments on Individual Reach/pollutant Listing Decisions

In addition to these general comments, the Sanitation Districts have comments on some specific listing decisions. As stated above, detailed comments are provided in the attachment to this letter. Because the implications of erroneous listings are substantial, the Sanitation Districts urge the State Board to consider this information in making the appropriate changes to the Draft List.

In conclusion, the Sanitation Districts would like to thank the State Board for its efforts up to this point in revising the proposed 2016 303(d) List. We urge the State Board to consider the information and analysis contained in this letter to complete the development of a scientifically and legally defensible list with a sound and consistent basis. If you have any questions regarding our comments or the information and data we are providing to you, please contact Phil Markle at (562) 908-4288, extension 2808, pmarkle@lacsd.org.

Very truly yours,

Ann T. Heil
Section Head
Reuse and Compliance

ATH:JDW:nm
Attachments

cc: Nicholas Martorano, Stacy Gillespie, Jessie Maxfield State Water Resources Control Board

Fact Sheet #1

Water Body:	**Santa Clara River Reach 5**
Pollutant:	**Benthic Community Effects**
Listing:	**List on 303(d) List (TMDL Required List)**
Comment & Recommendation:	**Do Not List – Water Quality Objectives Being Achieved**

The State Water Resources Control Board (State Board) is currently proposing that a new listing for benthic community effects be made to the 303(d) list for Reach 5 of the Santa Clara River, based on Southern Coastal California Index of Biotic integrity (SCIBI) scores. The Sanitation Districts believe this proposed listing is inappropriate and recommend not listing or listing as a Category 3 (insufficient data) stream reach for the reasons listed below; supporting evidence is provided in the sections that follow.

- The SCIBI-based analysis has been demonstrated to be inadequate for use in low gradient/low elevation watersheds similar to the reaches in the upper Santa Clara River. In 2010 the State Board agreed that the SCIBI was an inadequate tool for assessment of the Santa Clara River and did not approve the staff recommendation to place these water bodies on the 303(d) for benthic community impairment.

- Although the CSCI at least partially addresses some of the problems with the SCIBI by employing a modeled reference condition as opposed to the regional reference pool used by the SCIBI, the low number of reference sites in large watersheds, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI. Specifically, several Santa Clara River sites have been shown to fall outside the experience of the CSCI model.

- Bioassessment monitoring using the CSCI scoring tool has demonstrated an unimpaired benthic community. The sole CSCI score included in the current data set met the proposed 0.79 threshold.

- Physical habitat was not assessed, as required by the State Board Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). Historically unmanaged or unmanageable stressors (e.g. channel/habitat modifications) are well documented as precluding sites from achieving reference conditions. An evaluation of relevant physical habitat data is critical to identify whether observed impacts are due to these stressors. A lack of such evaluation should result in designation to Category 3.

- The proposed listing fails to associate the alleged impairment with pollutants impacting aquatic life beneficial uses.

Fact Sheet #1

SCIBI Is an Inadequate Metric for Assessing Low Gradient, Low Elevation Streams.

Section 3.9 of the Listing Policy states:

> "A water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities **as compared to reference site(s)** and is associated with water or sediment concentrations of pollutants including but not limited to chemical concentrations, temperature, dissolved oxygen, and trash." [Emphasis added.]

In response to written comments, California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff state:

> "At this time, the CSCI (and IBI where CSCI is not available) is the best measure of biologic integrity in California streams and it is appropriate to use IBI and CSCI in 303(d) listing decisions. As the science progresses, improved methods may supplant older methods and the 303(d) list will be updated, as appropriate, as that occurs. The discussion of the strengths and weaknesses of scoring methods and additional areas needing additional research, are appreciated, but are not a justification to delay making 303(d) listing decisions."

Technical experts and the State Board, alike, have acknowledged the limitations of the SCIBI (and other IBIs) and indicated that it is critical that conditions represent the full range of environmental gradients where an index will be used.[1]. While it is commonly assumed that the SCIBI inherently accounted for reference conditions, the reference conditions used to develop the SCIBI were not representative of the low elevation/low gradient streams commonly found in the alluvial plains of the Los Angeles Region.[2,3] It was developed using data from 275 sites, ranging from Monterey County to the Mexican border, but not a single reference location represented low elevation and low gradient streams. Santa Clara River Reach 6 is an extremely low gradient (less than 0.5%), low elevation, large coastal water body; therefore, the reference pool used for development of the SCIBI is not representative of natural conditions relevant to this reach. Consequently, the State Board has supported and funded the development of the CSCI scoring tool; this new, predictive index represents a substantial increase in the applicability of indices.

In 2010, the State Board agreed that the SCIBI was an inadequate tool for assessment of the Santa Clara River and did not approve the staff recommendation to place these water bodies on the 303(d) list benthic community impairment.

Regions May Be Outside the Experience of the CSCI

The State Board is developing the CSCI scoring tool that is intended to replace the flawed IBI scoring tools statewide. The CSCI at least partially addresses some of the problems with the SCIBI by employing a modeled reference condition as opposed to the regional reference pool used by the SCIBI. Reliance upon this modeled reference condition has significantly improved the applicability and resolution of the

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[1] Mazor, R.D., A.C. Rehn, P.R. Ode, M. Engeln, K.C. Schiff, E.D. Stein, D.J. Gillett, D.B. Herbst, and C.P. Hawkins. (2016). Bioassessment in complex environments: Designing an index for consistent meaning in different settings. Freshwater Science 35(1): 249-271. Available at http://www.journals.uchicago.edu/doi/full/10.1086/684130

[2] Ode, P.R., A.C. Rehn, J.T. May. (2005). A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management Vol. 35, No 4. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/coastalstreams.pdf

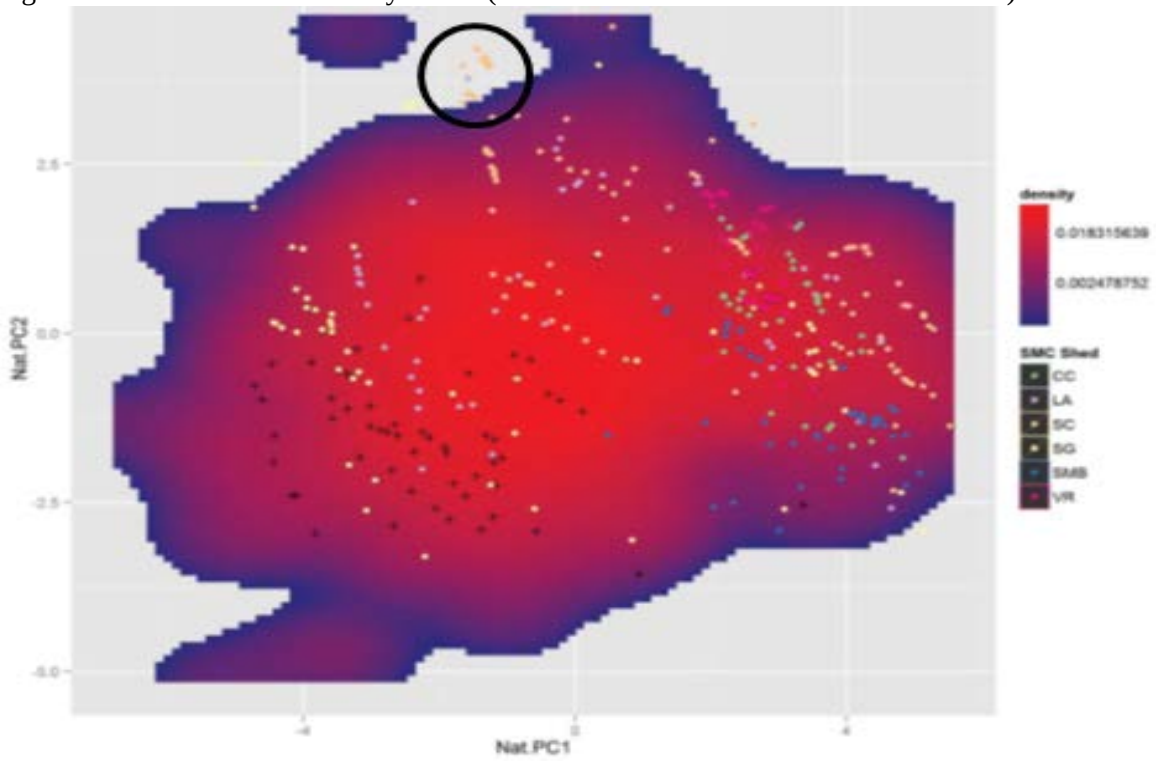
[3] Carter, J.L. and V.H. Resh. (2005). Pacific Coast Rivers of the Coterminous United States. pp. 541-590 *in*: A.C. Benke and C.E. Cushing (eds.), Rivers of North America. Elsevier Academic Press. Boston, MA.

bioassessment scoring tools; however, the lack of any reference sites in large watersheds, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI. A number of these environmental gradients exist, alone or in combination.

The Southern California Stormwater Monitoring Coalition (SMC) evaluated the CSCI reference pool using principle components analysis. The environmental gradients used as predictors for the CSCI were compressed into two dimensions and used to generate a heat map (Figure 1). Figure 1 shows the availability of data to determine reference conditions; red areas indicate a higher density of reference locations, darker/blue areas indicate fewer reference locations, and gray indicates sites that may be outside the experience of the CSCI. Several of the Santa Clara River sites (orange symbols circled in Figure 1) fall outside of CSCI reference conditions and presumably outside the experience of the CSCI model. In these situations, it has been suggested that the CSCI could be used in conjunction with an alternative (i.e., non-threshold based) assessment option (i.e., upstream-downstream comparison).

In response to written comments, the Regional Board stated, "The text accompanying the Reference Density Cloud in the presentation states, "*Could be used to establish exceptions for truly unique environmental settings.*" Nonetheless, it does not appear that any "truly unique environmental settings" have been established or are recognized by the State Bioassessment workgroup or other authority." The Sanitation Districts acknowledge that there has been no formal designation of "truly unique environmental settings". However, analyses suggest that a pronounced lack of reference sites in large watershed, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI and casts a high degree of uncertainty on using the proposed 0.79 threshold.

Figure 1. CSCI Reference Density Cloud (Santa Clara River Sites within Black Circle).



Fact Sheet #1

CSCI Data from Within Reach 5 of the Santa Clara River Show No Impairment

The proposed listing references one CSCI result. The single station with Reach 5, SCR 1272, had a CSCI score of 0.93. **Thus, the only CSCI score in this Reach is above the proposed threshold of impairment**.

The Proposed Listing Fails to Evaluate Physical Habitat Data

Section 6.1.5.8 of the listing policy states:

> "When evaluating biological data and information, RWQCBs shall evaluate all readily available data and information and shall
> - Evaluate bioassessment data from other sites, and compare to reference condition.
> - Evaluate physical habitat data and other water quality data, when available, to support conclusions about the status of the water segment."

In response to written comments, the Regional Board staff asserted that "The proposed listing evaluates the physical habitat data; physical habitat is incorporated into the determination of reference sites." This appears to be a misunderstanding of physical habitat data, the SCIBI, and the CSCI.

The SCIBI reference condition was based on land use screening coupled with professional judgement to cull sites with obvious bank stability or sedimentation issues, and two suites of physical features were indirectly incorporated into assessments using the CSCI. First, 11 predictors are used to generate a list of expected taxa. These include latitude and longitude of the sampling location, site elevation, difference in elevation between the sample point and highest point in the catchment, watershed area, average precipitation at the sample point, average temperature at the sample point, mean June precipitation averaged across the catchment, average bulk soil density, average soil erodibility factor, and average phosphorous geology[4]. In addition, a number of land cover, land use, and other measures of human activity (e.g. % agriculture, % urban, dam distance, predicted conductivity) were used as thresholds to select reference sites for the CSCI[5]. Neither of these suites of observations should be confused with physical habitat (i.e. instream and riparian habitat), as defined and utilized within a bioassessment program to aid in interpretation of bioassessment data[6].

While there is no simple physical habitat index that can be used for this evaluation, multiple other approaches are available. For example, the San Diego Regional Board's (Region 9) most recent Integrated Report evaluated instream physical habitat data, CRAM data, and aerial imagery to evaluate habitat modification/hydromodification. A more recent tool developed by Southern California Coastal Water Research Project (SCCWRP) staff through a State Board effort has resulted in a quantitative tool to

[4] Mazor, R. et al. (2016). The California Stream Condition Index (CSCI): Interim instructions for calculating scores using GIS and R. California Surface Water Ambient Monitoring Program SOP 2015-0004. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/bioassessment/docs/csci_scoring_instruct.pdf

[5] Ode, P. R., Rehn, A. C., Mazor, R. D., Schiff, K. C., Stein, E. D., May, J. T., & Hawkins, C. P. (2016). Evaluating the adequacy of a reference-site pool for ecological assessments in environmentally complex regions. *Freshwater Science*, *35*(1), 237-248. Available at http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13_337_355.pdf

[6] Ode, P. R. (2007). Standard operating procedures for collecting benthic macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. *California State Water Resources Control Board. Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP*. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/phab_sopr6.pdf

identify streams/reaches that are likely to be "constrained" by habitat or other, non-water quality parameters (the model used land cover, road density, canal density, mines, dams, aerial deposition, and non-native vegetation). When applying this tool to the Santa Clara Reach 5 location, SCCWRP determined that this location is "likely constrained", meaning unlikely to achieve a CSCI score of 0.79 due to landscape development (Figure 2).

Figure 2. Santa Clara River Reach 5, Classified as "Likely Constrained"

In addition to the Listing Policy requirement, EPA cites physical habitat as a leading cause of impairment in streams on 303(d) lists and recommends that, in all cases where physical habitat is evaluated, stream size and channel dimensions, channel gradient, channel substrate size and type, habitat complexity and cover, vegetation cover and structure, and channel-riparian interactions should all be considered before making a decision.[7] Likewise, the Southern California Stormwater Monitoring Coalition (SMC) identified habitat stressors among the highest priority for evaluation in relation to depressed benthic community assemblages.[8] Coupled with a high scoring CSCI score, this lack of evaluation should warrant not listing or, at most, designation to Category 3 (insufficient data).

[7] U.S. EPA (Environmental Protection Agency). (2010). Causal Analysis/Diagnosis Decision Information System (CADDIS). Office of Research and Development, Washington, DC. Available online at https://www.epa.gov/caddis. Last updated September 23, 2010

[8] Southern California Stormwater Monitoring Coalition (SMC). 2017. 2015 Report on the Stormwater Monitoring Coalition Regional Stream Survey. SCCWRP Technical Report 963. Southern California Coastal Water Research Project. Costa Mesa, CA. Available at http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/963_2015_SMC_Report_EnginChannels.pdf

Fact Sheet #1

The Proposed Listing Fails to Associate the Alleged Impairment with Other Pollutants

The Listing Policy states:

> "A water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and **is associated with** water or sediment concentrations of pollutants including but not limited to chemical concentrations, temperature, dissolved oxygen, and trash." [Emphasis added.]

In written response to comments, Regional Board staff stated, "The proposed listing is associated with the documented impairments of other pollutants, including iron, toxicity and zinc. Furthermore, the Causal Assessment demonstrated that the impairment is associated with chloride." However, neither zinc nor toxicity impairments exist in this Reach.

It is also apparent that the observed iron concentration would not harm benthic communities at the site where bioassessment was conducted, due to low concentrations and due to its presence in a non-bioavailable form. The 1.0 ppm iron criterion used as the basis for the proposed iron impairment in this reach is a 4-day average threshold taken from the 1976 USEPA "Red Book" and was updated using the 1985 Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. However, iron was detected only sporadically at levels above 1.0 ppm, and concentrations below the point source discharge were consistently low, suggesting that the 4-day average threshold of 1.0 mg/L is likely achieved. Furthermore, the bioavailable form of iron is ferrous iron and only exists at low pH levels. The pH in Reach 5 averages 7.9 with a 5th percentile pH of 7.5. In ambient waters with sufficient dissolved oxygen and a pH above 7.0, iron will rapidly oxidize to a non-bioavailable form and would not be responsible for impacts to aquatic life. In fact, the Red Book includes a disclaimer that "data obtained under laboratory conditions suggest a greater toxicity for iron than that obtained in natural ecosystems."

Finally, caution should be exercised when using conclusions from the 2012 causal assessment. Biological condition in this study was based on the inadequate SCIBI. Furthermore, participants in this training exercise attempted to identify potential causes of biological impairment for a site/sample which was not impaired (SCIBI = 39). These factors generate a considerable amount of uncertainty in the authors' conclusion. Note that rather than stating that the "impairment is associated with chloride" the authors stated, "Of the seven candidate causes, there was supporting evidence that elevated conductivity may be partially responsible for the observed biological condition at the test site."

Fact Sheet #2

Water Body:	**Santa Clara River Reach 6**
Pollutant:	**Benthic Community Effects**
Listing:	**List on 303(d) List (TMDL Required List)**
Comment & Recommendation:	**List on Category 3 – Insufficient Data**

The State Water Resources Control Board (State Board) is currently proposing that a new listing for benthic community effects be made to the 303(d) list for Reach 6 of the Santa Clara River, based on Southern Coastal California Index of Biotic integrity (SCIBI) scores. The Sanitation Districts believe this proposed listing is inappropriate and recommend not listing the stream reach or listing it in Category 3 (insufficient data) for the reasons below; supporting evidence is provided in the sections that follow.

- The SCIBI-based analysis has been demonstrated to be inadequate for use in low gradient/low elevation watersheds similar to the reaches in the upper Santa Clara River. In 2010 the State Board agreed that the SCIBI was an inadequate tool for assessment of the Santa Clara River and did not approve the staff recommendation to place these water bodies on the 303(d) for benthic community impairment.

- Although the CSCI at least partially addresses some of the problems with the SCIBI by employing a modeled reference condition as opposed to the regional reference pool used by the SCIBI, the low number of reference sites in large watersheds, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI. Specifically, several Santa Clara River sites have been shown to fall outside the experience of the CSCI model.

- Physical habitat was not assessed, as required by the State Board Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). Historically unmanaged or unmanageable stressors (e.g. channel/habitat modifications) are well documented as precluding sites from achieving reference conditions. An evaluation of relevant physical habitat data is critical to determine if these habitat-related stressors are limiting the biological capacity of a site. In the absence of such an evaluation, sites not meeting the biological condition threshold should be placed in Category 3.

Fact Sheet #2

SCIBI Is an Inadequate Metric for Assessing Low Gradient, Low Elevation Streams.

Section 3.9 of the Listing Policy states:

> "A water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities **as compared to reference site(s)** and is associated with water or sediment concentrations of pollutants including but not limited to chemical concentrations, temperature, dissolved oxygen, and trash." [Emphasis added.]

In response to written comments, California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff state:

> "At this time, the CSCI (and IBI where CSCI is not available) is the best measure of biologic integrity in California streams and it is appropriate to use IBI and CSCI in 303(d) listing decisions. As the science progresses, improved methods may supplant older methods and the 303(d) list will be updated, as appropriate, as that occurs. The discussion of the strengths and weaknesses of scoring methods and additional areas needing additional research, are appreciated, but are not a justification to delay making 303(d) listing decisions."

Technical experts and the State Board, alike, have acknowledged the limitations of the SCIBI (and other IBIs) and indicated that it is critical that conditions represent the full range of environmental gradients where an index will be used.[1]. While it is commonly assumed that the SCIBI inherently accounted for reference conditions, the reference conditions used to develop the SCIBI were not representative of the low elevation/low gradient streams commonly found in the alluvial plains of the Los Angeles Region.[2,3] It was developed using data from 275 sites, ranging from Monterey County to the Mexican border, but not a single reference location represented low elevation and low gradient streams. Santa Clara River Reach 6 is an extremely low gradient (less than 0.5%), low elevation, large coastal water body; therefore, the reference pool used for development of the SCIBI is not representative of natural conditions relevant to this reach. Consequently, the State Board has supported and funded the development of the CSCI scoring tool; this new, predictive index represents a substantial increase in the applicability of indices.

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Regions May Be Outside the Experience of the CSCI

The State Board is developing the CSCI scoring tool that is intended to replace the flawed IBI scoring tools statewide. The CSCI at least partially addresses some of the problems with the SCIBI by employing a modeled reference condition as opposed to the regional reference pool used by the SCIBI. Reliance upon this modeled reference condition has significantly improved the applicability and resolution of the

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[2] Ode, P.R., A.C. Rehn, J.T. May. (2005). A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management Vol. 35, No 4. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/coastalstreams.pdf

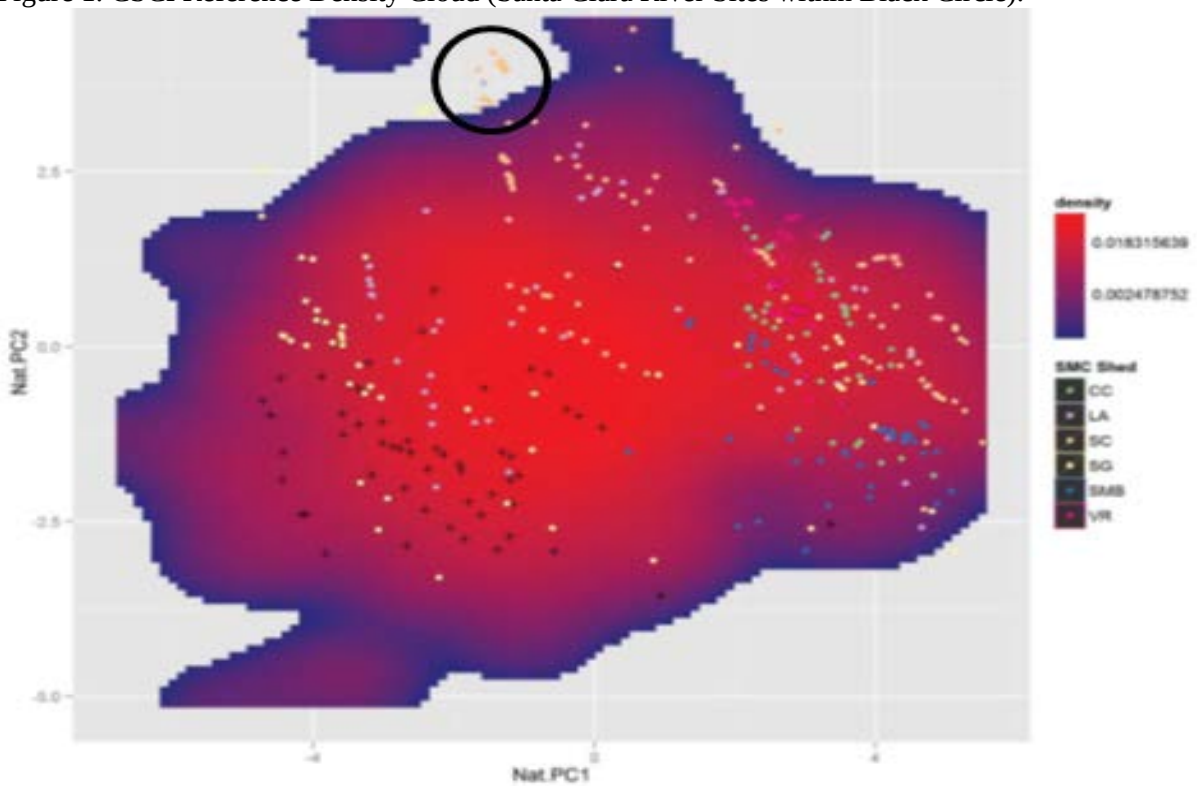
[3] Carter, J.L. and V.H. Resh. (2005). Pacific Coast Rivers of the Coterminous United States. pp. 541-590 *in*: A.C. Benke and C.E. Cushing (eds.), Rivers of North America. Elsevier Academic Press. Boston, MA.

bioassessment scoring tools; however, the lack of any reference sites in large watersheds, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI. A number of these environmental gradients exist, alone or in combination.

The Southern California Stormwater Monitoring Coalition (SMC) evaluated the CSCI reference pool using principle components analysis. The environmental gradients used as predictors for the CSCI were compressed into two dimensions and used to generate a heat map (Figure 1). Figure 1 shows the availability of data to determine reference conditions; red areas indicate a higher density of reference locations, darker/blue areas indicate fewer reference locations, and gray indicates sites that may be outside the experience of the CSCI. Several of the Santa Clara River sites (orange symbols circled in Figure 1) fall outside of CSCI reference conditions and presumably outside the experience of the CSCI model. In these situations, it has been suggested that the CSCI could be used in conjunction with an alternative (i.e., non-threshold based) assessment option (i.e., upstream-downstream comparison).

In response to written comments, the Regional Board stated, "The text accompanying the Reference Density Cloud in the presentation states, "*Could be used to establish exceptions for truly unique environmental settings.*" Nonetheless, it does not appear that any "truly unique environmental settings" have been established or are recognized by the State Bioassessment workgroup or other authority." The Sanitation Districts acknowledge that there has been no formal designation of "truly unique environmental settings". However, analyses suggest that a pronounced lack of reference sites in large watershed, low gradient, and low elevation systems still limits the identification of appropriate thresholds using the CSCI and casts a high degree of uncertainty on using the proposed 0.79 threshold.

Figure 1. CSCI Reference Density Cloud (Santa Clara River Sites within Black Circle).



Fact Sheet #2

The Proposed Listing Fails to Evaluate Physical Habitat Data

Section 6.1.5.8 of the listing policy states:

> "When evaluating biological data and information, RWQCBs shall evaluate all readily available data and information and shall
> - Evaluate bioassessment data from other sites, and compare to reference condition.
> - Evaluate physical habitat data and other water quality data, when available, to support conclusions about the status of the water segment."

In response to written comments, Regional Board staff asserted that "The proposed listing evaluates the physical habitat data; physical habitat is incorporated into the determination of reference sites." This appears to be a misunderstanding of physical habitat data, the SCIBI, and the CSCI.

The SCIBI reference condition was based on land use screening coupled with professional judgement to cull sites with obvious bank stability or sedimentation issues, and two suites of physical features were indirectly incorporated into assessments using the CSCI. First, 11 predictors are used to generate a list of expected taxa. These include latitude and longitude of the sampling location, site elevation, difference in elevation between the sample point and highest point in the catchment, watershed area, average precipitation at the sample point, average temperature at the sample point, mean June precipitation averaged across the catchment, average bulk soil density, average soil erodibility factor, and average phosphorous geology[4]. In addition, a number of land cover, land use, and other measures of human activity (e.g. % ag, % urban, dam distance, predicted conductivity) were used as thresholds to select reference sites for the CSCI[5]. Neither of these suites of observations should be confused with physical habitat (i.e. instream and riparian habitat), as defined and utilized within a bioassessment program to aid in interpretation of bioassessment data[6].

While there is no simple physical habitat that can be used for this evaluation, multiple other approaches are available. For example, the San Diego Regional Board's (Region 9) most recent Integrated Report evaluated instream physical habitat data, CRAM data, and aerial imagery to evaluate habitat modification/hydromodification. A more recent tool developed by Southern California Coastal Water Research Project (SCCWRP) staff through a State Board effort has resulted in a quantitative tool to identify streams/reaches that are likely to be "constrained" by habitat or other, non-water quality parameters (the model used land cover, road density, canal density, mines, dams, aerial deposition, and non-native vegetation). When applying this tool to the Santa Clara Reach 6 location, SCCWRP determined that this location is "likely constrained", meaning unlikely to achieve a CSCI score of 0.79 due to landscape development (Figure 2).

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[4] Mazor, R. et al. (2016). The California Stream Condition Index (CSCI): Interim instructions for calculating scores using GIS and R. California Surface Water Ambient Monitoring Program SOP 2015-0004. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/bioassessment/docs/csci_scoring_instruct.pdf

[5] Ode, P. R., Rehn, A. C., Mazor, R. D., Schiff, K. C., Stein, E. D., May, J. T., & Hawkins, C. P. (2016). Evaluating the adequacy of a reference-site pool for ecological assessments in environmentally complex regions. *Freshwater Science*, *35*(1), 237-248. Available at http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13_337_355.pdf

[6] Ode, P. R. (2007). Standard operating procedures for collecting benthic macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. *California State Water Resources Control Board. Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP*. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/phab_sopr6.pdf

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Figure 2. Santa Clara River Reach 6, Classified as "Likely Constrained"

In addition to the Listing Policy requirement, EPA cites physical habitat as a leading cause of impairment in streams on 303(d) lists and recommends that, in all cases where physical habitat is evaluated, stream size and channel dimensions, channel gradient, channel substrate size and type, habitat complexity and cover, vegetation cover and structure, and channel-riparian interactions should all be considered before making a decision.[7] Likewise, the Southern California Stormwater Monitoring Coalition (SMC) identified habitat stressors among the highest priority for evaluation in relation to depressed benthic community assemblages.[8]

Finally, a review of data used in this listing revealed that the bioassessment survey associated with this proposed listing was at a location very near the resurfacing of hyporheic flows. Such a discontinuity in the river continuum has been found to adversely impact resident biota.[9] Additional investigations should take place to determine the impact of the discontinuity and other physical habitat limitations on the benthic community. Until such an investigation has been conducted, a listing designation to Category 3 (insufficient data) should be made.

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[7] U.S. EPA (Environmental Protection Agency). (2010). Causal Analysis/Diagnosis Decision Information System (CADDIS). Office of Research and Development, Washington, DC. Available online at https://www.epa.gov/caddis. Last updated September 23, 2010

[8] Southern California Stormwater Monitoring Coalition (SMC). 2017. 2015 Report on the Stormwater Monitoring Coalition Regional Stream Survey. SCCWRP Technical Report 963. Southern California Coastal Water Research Project. Costa Mesa, CA. Available at http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/963_2015_SMC_Report_EnginChannels.pdf

[9] Burchsted, D., Daniels, M., & Wohl, E. E. (2014). Introduction to the special issue on discontinuity of fluvial systems. Available at http://environment.yale.edu/forests/files/burchetal14.pdf

Fact Sheet #3

Water Body:	**Medea Creek Reach 1**
Pollutant:	**Benthic Community Effects**
Listing:	**List on 303(d) List (TMDL Required List)**
Comment & Recommendation:	**Do Not List – Water Quality Objectives Being Achieved**

The State Water Resources Control Board (State Board) is proposing that a new listing for benthic community effects be made to the 303(d) list for Reach 1 of the Medea Creek, based on a weight of evidence approach using California Stream Condition Index (CSCI) and Southern Coastal California Index of Biotic integrity (SCIBI) scores. The Districts believe this proposed listing is inappropriate and recommend not listing for the reasons listed below; supporting evidence is provided in the sections that follow.

- Physical habitat was not assessed, as required by the State Board Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). Historically unmanaged or unmanageable stressors (e.g. channel/habitat modifications) are well documented as precluding sites from achieving reference conditions. An evaluation of relevant physical habitat data is critical to identify whether observed impacts are due to these stressors. A lack of such evaluation should result in designation to Category 3.

- The proposed listing fails to associate the alleged impairment with other pollutants impacting aquatic beneficial uses.

The Proposed Listing Fails to Evaluate Physical Habitat Data

Section 6.1.5.8 of the Listing Policy states:

> "When evaluating biological data and information, RWQCBs shall evaluate all readily available data and information and shall
> - Evaluate bioassessment data from other sites, and compare to reference condition.
> - Evaluate physical habitat data and other water quality data, when available, to support conclusions about the status of the water segment."

In response to written comments, California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff asserted that "The proposed listing evaluates the physical habitat data; physical habitat is incorporated into the determination of reference sites." This appears to be a misunderstanding of physical habitat data, the SCIBI, and the CSCI.

The SCIBI reference condition was based on land use screening coupled with professional judgement to cull sites with obvious bank stability or sedimentation issues, and two suites of physical features were indirectly incorporated into assessments using the CSCI. First, 11 predictors are used to generate a list of expected taxa. These include latitude and longitude of the sampling location, site elevation, difference in elevation between the sample point and highest point in the catchment, watershed area, average precipitation at the sample point, average temperature at the sample point, mean June precipitation averaged across the catchment, average bulk soil density, average soil erodibility factor, and average phosphorous geology[1]. In addition, a number of land cover, land use, and other measures of human

[1] Mazor, R. et al. (2016). The California Stream Condition Index (CSCI): Interim instructions for calculating scores using GIS and R. California Surface Water Ambient Monitoring Program SOP 2015-0004. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/bioassessment/docs/csci_scoring_instruct.pdf

activity (e.g. % agriculture, % urban, dam distance, predicted conductivity) were used as thresholds to select reference sites for the CSCI[2]. Neither of these suites of observations should be confused with physical habitat (i.e. instream and riparian habitat), as defined and utilized within a bioassessment program to aid in interpretation of bioassessment data[3].

While there is no simple physical habitat index that can be used for this evaluation, multiple other approaches are available. For example, the San Diego Regional Board's (Region 9) most recent Integrated Report evaluated instream physical habitat data, CRAM data, and aerial imagery to evaluate habitat modification/hydromodification. A more recent tool developed by Southern California Coastal Water Research Project (SCCWRP) staff through a State Board effort has resulted in a quantitative tool to identify streams/reaches which are likely to be "constrained" by habitat or other, non-water quality parameters (the model used land cover, road density, canal density, mines, dams, aerial deposition, and non-native vegetation). When applying this tool to the Medea Creek, SCCWRP determined that this location is "likely constrained", meaning unlikely to achieve a CSCI score of 0.79 due to landscape development (Figure 1).

Figure 1. Medea Creek, Classified as "Likely Constrained"

In addition to the Listing Policy requirement, EPA cites physical habitat as a leading cause of impairment in streams on 303(d) lists and recommends that, in all cases where physical habitat is evaluated, stream size and channel dimensions, channel gradient, channel substrate size and type, habitat complexity and cover, vegetation cover and structure, and channel-riparian interactions should all be considered before

[2] Ode, P. R., Rehn, A. C., Mazor, R. D., Schiff, K. C., Stein, E. D., May, J. T., & Hawkins, C. P. (2016). Evaluating the adequacy of a reference-site pool for ecological assessments in environmentally complex regions. *Freshwater Science*, *35*(1), 237-248. Available at http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13_337_355.pdf

[3] Ode, P. R. (2007). Standard operating procedures for collecting benthic macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. *California State Water Resources Control Board. Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP*. Available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/phab_sopr6.pdf

making a decision.[4] Likewise, the Southern California Stormwater Monitoring Coalition (SMC) identified habitat stressors among the highest priority for evaluation in relation to depressed benthic community assemblages.[5] Finally, a review of aerial imagery from the single monitoring location used in this listing revealed that sampling was conducted at a location which is heavily shored and downstream from a fully lined concrete channel. In similar proposed listings, Regional Board staff recognized the biologically limiting nature of some landscape conditions and opted to not recommend listing. The same approach is recommended here. Based upon this uncertainty and need for additional information, this site appears to be consistent with designation principles for Integrated Report Category 3.

The Proposed Listing Fails to Associate the Alleged Impairment with Other Pollutants

The Listing Policy states:

> "A water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and **is associated with** water or sediment concentrations of pollutants including but not limited to chemical concentrations, temperature, dissolved oxygen, and trash." [Emphasis added.]

In the fact sheets supporting its impairment decisions for each of these listings, the Regional Board stated and reaffirmed in response to written comments that the alleged impairment in benthic community composition in Reach 1 was justified by being "associated" with impairments for two pollutants, trash and selenium, simply because these constituents co-occurred. Reasons why it is not appropriate to use these pollutants to justify a listing for benthic community effects are provided below.

- Trash listings address non-contact recreation, not aquatic life beneficial uses. Furthermore, the most common routes of harm to aquatic organisms by trash are due to ingestion and entanglement – problems unlikely to impact benthic macroinvertebrate larvae.
- Much of the Malibu Creek watershed is listed as impaired for selenium. However, EPA has recognized that "Sulfate and selenium concentrations are present in excess of water quality criteria, **apparently due to natural geologic background**."[5] [Emphasis Added.] As such, this should not be associated as a pollutant.

[4] U.S. EPA (Environmental Protection Agency). (2010). Causal Analysis/Diagnosis Decision Information System (CADDIS). Office of Research and Development, Washington, DC. Available online at https://www.epa.gov/caddis. Last updated September 23, 2010

[5] Southern California Stormwater Monitoring Coalition (SMC). 2017. 2015 Report on the Stormwater Monitoring Coalition Regional Stream Survey. SCCWRP Technical Report 963. Southern California Coastal Water Research Project. Costa Mesa, CA. Available at http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/963_2015_SMC_Report_EnginChannels.pdf

Fact Sheet #4

Water Body: San Jose Creek Reach 1
Pollutant: Temperature, Water
Listing: List on 303(d) List (TMDL Required List)
Comment & Recommendation: Do Not List – Meets Water Quality Objective

The State Water Resources Control Board, (State Water Board) is proposing that a new listing for impairment due to water temperature be made to the 303(d) list for Reach 1 of San Jose Creek. The Sanitation Districts of Los Angeles County (Sanitation Districts) believe this proposed listing is inappropriate and recommend not listing due to water quality objectives being achieved.

Failure to Meet Water Quality Objectives Has Not Been Demonstrated

The Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) states that:

> "At no time shall these WARM-designated waters be raised above 80ºF **as a result of waste discharges**." [Emphasis added.]

In response to written comments, California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff state, "The 80°F temperature objective protects the aquatic life beneficial use of WARM in surface waters regardless of the ultimate source of the water in that reach of the river. The Los Angeles Water Board does not have different objectives for different seasons" and that "Analysis of sources and causes or identification of implementation measures to resolve or correct the impairment are not completed as part of the Integrated Report or 303(d) listing process." Furthermore, in Response to Comments #26.6 Regional Board staff state, "Exceedances in temperature may be caused in part by ambient temperature or exacerbated by the lack of tree cover in some reaches; exceedances may also be caused in part by waste discharge. The relative contribution of the causes of temperature exceedances is largely speculative, at this time." (emphasis added).

First, the 80°F temperature objective is not a hard and fast number that was set as a threshold above which aquatic life would not be protected. Rather the Basin Plan only prohibits the raising of water temperature above 80°F as a result of waste discharges. The Basin Plan accommodates temperatures above 80°F without considering them to be violations, as long they are not as a result of waste discharges. The standard was set this way presumably to recognize that there are natural variations in temperature in the Los Angeles Basin that may occur even in the absence of waste discharges. Note that objectives in the Basin Plan for pH and dissolved oxygen are written in the same way (i.e., including the language "as a result of waste discharges"), recognizing that these parameters may vary considerably due to natural factors. Also, while the Basin Plan does not have different objectives for different seasons, the Basin Plan language inherently recognizes natural variations in temperature by allowing them to exceed 80°F when it is not a result of waste discharge. The Southern California area routinely experiences temperatures well above 80°F during the summer months, and the Basin Plan was written to accommodate higher temperatures caused by these ambient conditions.

Additionally, the Sanitation Districts respect that source identification typically is not part of the 303(d) listing process for most pollutants. However, this water quality objective clearly distinguishes between exceedance of the 80ºF standard caused by "waste discharges" and those associated with other causes. In cases such as these, the burden falls on the Water Boards to demonstrate that temperature in excess of 80ºF were as a result of waste discharge before an impairment listing can be made. Based on the wording of the receiving water objective, a receiving water exceeding 80°F caused by factors other than wastes discharged would not represent an exceedance of the objective.

Therefore, when assessing the temperature objective in Region 4, an analysis of the source or cause is both required and critical in determining if the objective was exceeded. Furthermore, as described in more detail below, a Sanitation Districts survey clearly demonstrates that summertime excursions greater than the 80ºF in this reach are not caused by waste discharges but are due to elevated ambient air temperature, conductive and radiative heating associated with hardened landscapes, a lack of riparian cover, and increased ambient temperatures related to climate change. Additionally, the proposed listing and associated fact sheets do not contain any analysis or evidence refuting the findings of this survey.

Instead, the Regional Board Fact Sheet states that a single line of evidence was used in the assessment of temperature. Specifically, 42 of 301 samples from Pom-RD, Pom-RC, SJC-C1, and SJC-C2 exceeded the objective from July 2005 to November 2010 using the "Data for Various Pollutants in Various Water Bodies in Sanitation Districts of Los Angeles County, 2005-2010" dataset. (Appendix A of the Sanitation Districts' March 30, 2017 letter "Comments on the February 2017 Proposed 2016 Los Angeles Region Clean Water Act Section 303(d) List of Impaired Waters" contains the full set of data applicable to this listing from Appendix G of the Regional Board Draft Staff Report.) Note that based on a review of the dataset utilized for the listing evaluation, the Sanitation Districts identified 339 discrete temperature measurements, not 301. The dataset contains 368 results; however, 29 samples were duplicates. Of the 339 unique temperature measurements, 46 exhibited a temperature that exceeded 80 ºF, not 42. However, 14 of the 46 temperature exceedances were demonstrably caused by conduction and radiation (details below), not waste discharges. Conduction and radiative heating likely also caused the remaining 32 exceedances out of 339 measurements; this total does not meet the minimum number of measured exceedances needed to place a water segment on the section 303(d) list.

Pom-RC and Pom-RD Excursions Above 80 ºF Are Demonstrably Not a Result of Waste Discharges

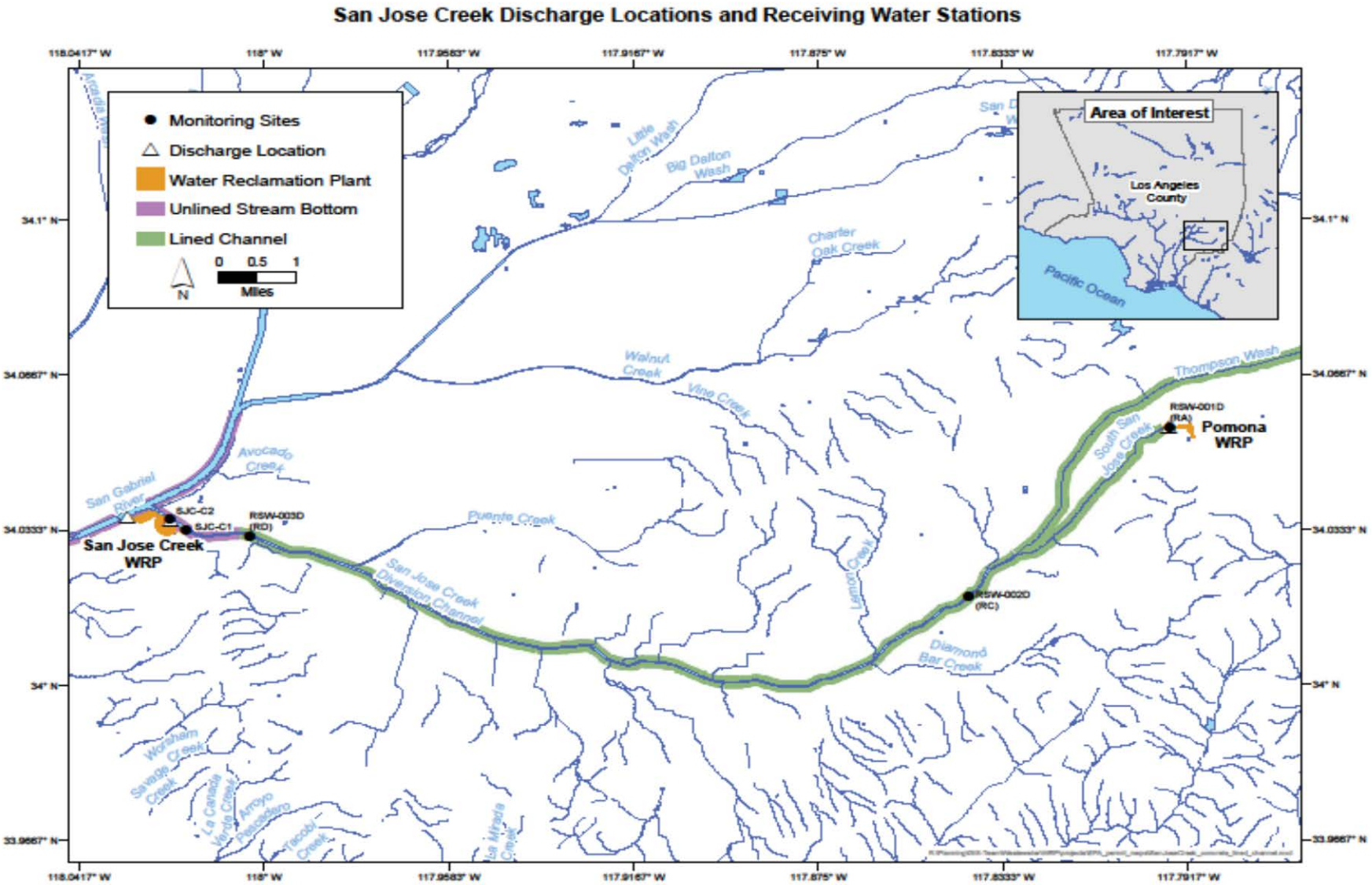
Tertiary treated water from the Pomona Water Reclamation Plant is discharged to the south fork of San Jose Creek and flows into Reach 1. Receiving water stations Pom-RC, Pom-RD, and SJC-C1 are located approximately 3, 12, and 12.5 miles from the upstream border of Reach 1, respectively. Reach 1 is fully lined in concrete from the upstream border to just upstream of SJC-C1 (Figure 1).

As observed by Sanitation Districts staff and corroborated by EPA staff[1], groundwater exudes from relief structures distributed throughout the concrete-lined bottom, even in mid-summer (August) after several years of drought (Figure 2). In the absence of discharge from the Pomona Water Reclamation Plant or other observed discharges, flows in SJC between Pom-RC and Pom-RD increase by 200% to greater than 400% (Figure 3) due to the release of this groundwater, which has a localized average temperature of approximately 67 ºF.[2] As this groundwater-dominated flow travels downstream, the temperature naturally rises (Figure 4) due to heat conduction through the warm concrete lining and solar radiation exposure in the unshaded channel (Figure 5 shows ambient air temperature as a proxy for solar radiation[3]). When the concrete channel ends upstream of SJC-C1, the water leaves the heat source (concrete channel) and mixes with additional groundwater, resulting in consistently cooler temperatures. The observed spatial and temporal temperature profile, coupled with no identifiable waste discharges and substantial groundwater contributions, clearly demonstrates that the temperature excursions in Reach 1 of San Jose Creek are not a result of waste discharges.

[1] Fleming, Terrence. 2009. Selenium Data from San Jose Creek. Email to Phil Markle. Copy included.
[2] https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/ex/jne_henrys_map.html
[3] PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu/explorer/, created 24 Feb 2017.

Fact Sheet #4

Figure 1. Pomona/San Jose Creek Receiving Water Map



Fact Sheet #4

Figure 2. Manhole (Outlined by Purple Circle) Exuding Groundwater into San Jose Creek

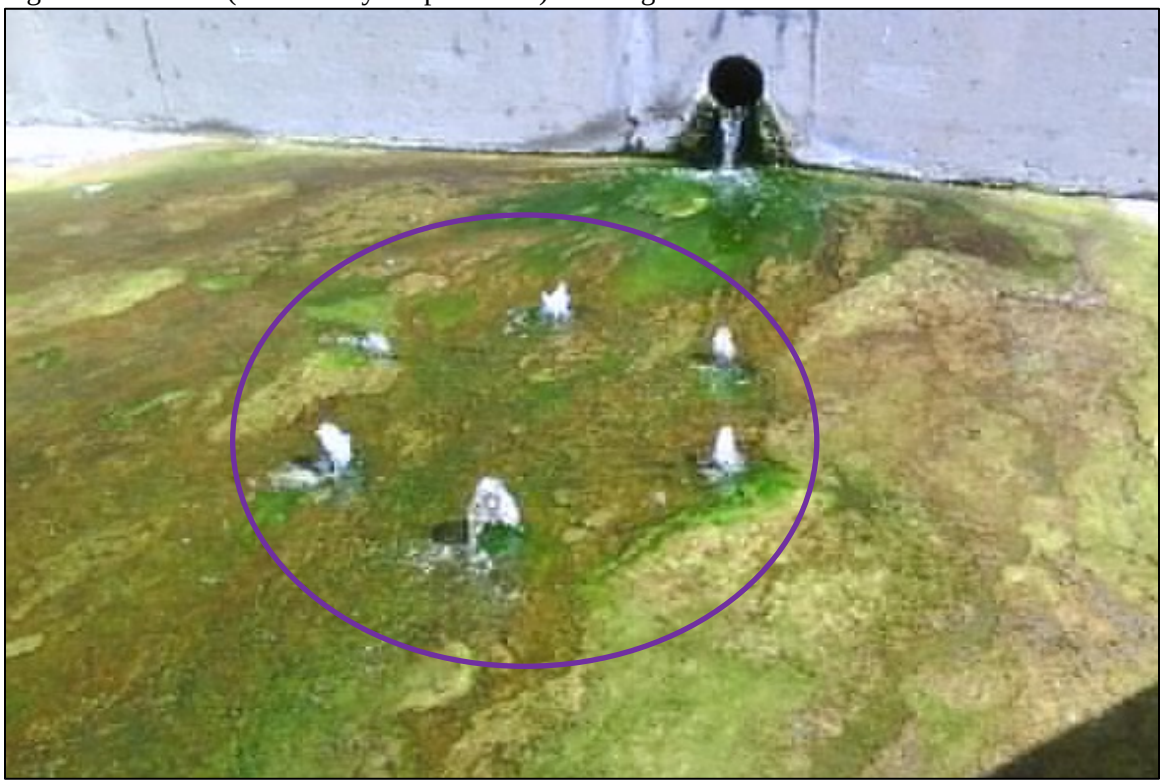


Figure 3. Measured Flow at Pom-RC and Pom-RD in the Absence of Discharge from Pomona WRP

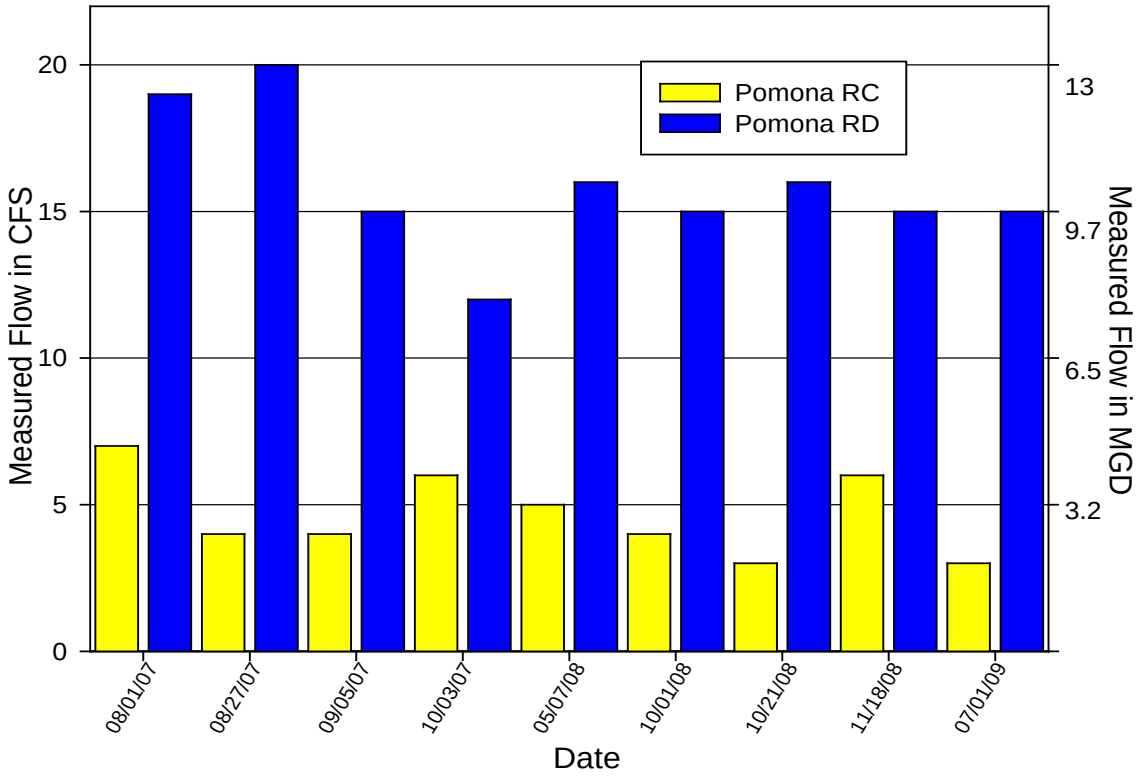


Figure 4. Monthly Average Water Temperatures Between July 2005 and November 2010 in the Absence of Discharge from the Pomona WRP at

- Pom-RC: Upstream Location in the Concrete-Lined Portion of the Reach
- Pom-RD: Downstream Location in the Concrete-Lined Portion of the Reach
- SJC-C1: Unlined Portion of the Reach

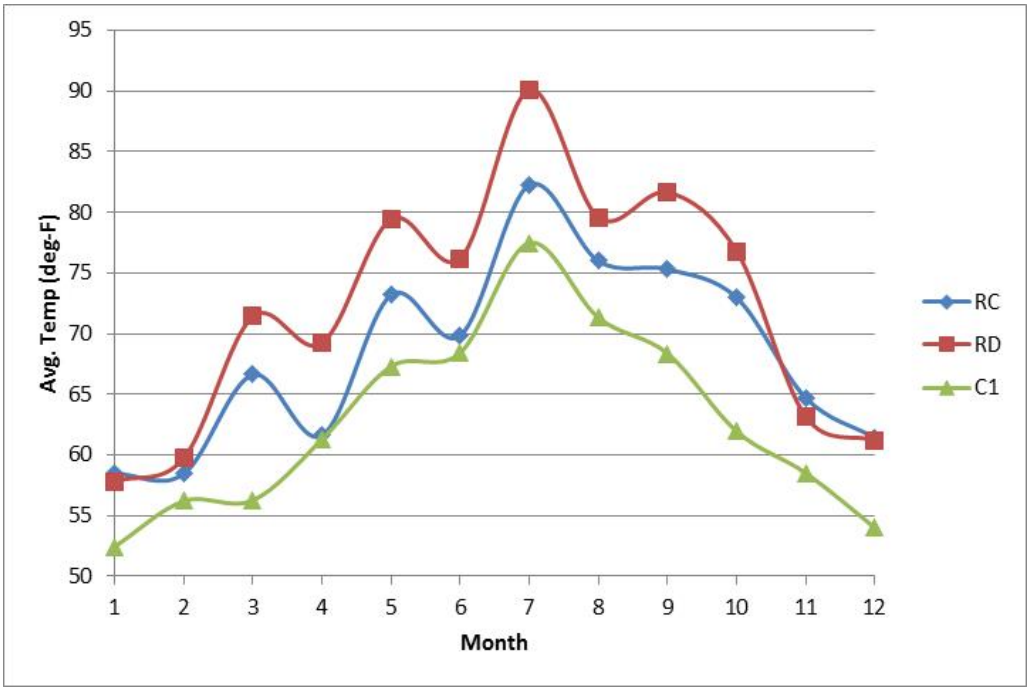
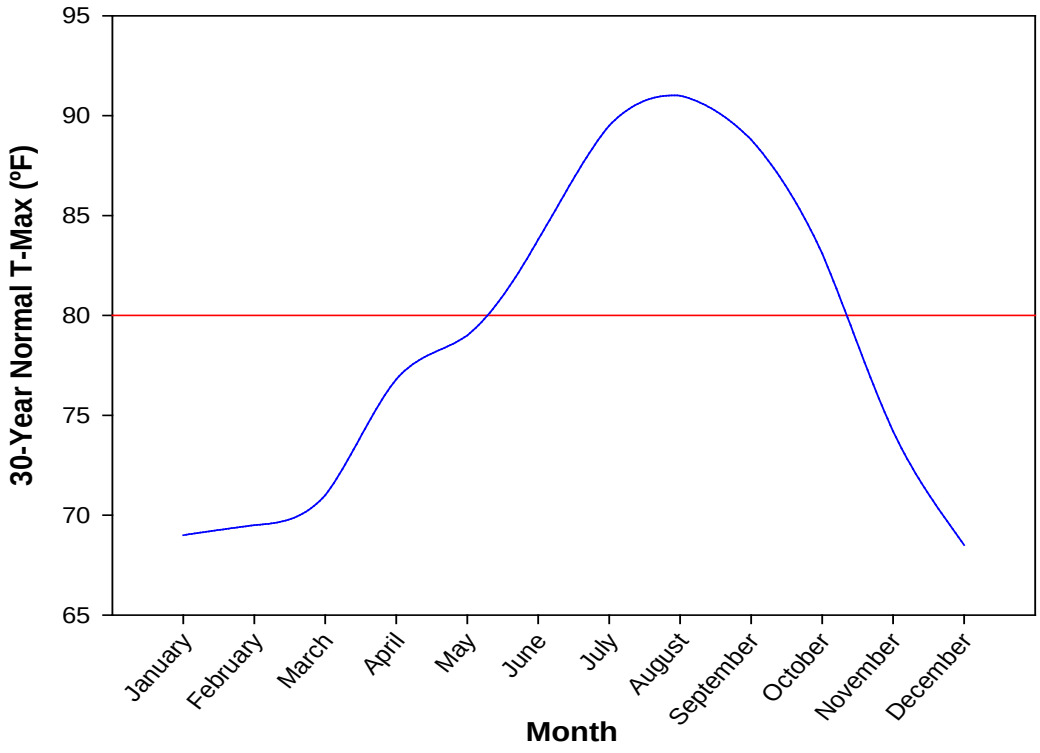


Figure 5. 30-Year Normal Monthly Maximum Air Temperature at Pom-RD[3]



Fact Sheet #4

-----Original Message-----
From: Fleming.Terrence@epamail.epa.gov [mailto:Fleming.Terrence@epamail.epa.gov]
Sent: Tuesday, September 08, 2009 4:15 PM
To: Markle, Phil
Subject: Fw: Selenium data from San Jose Creek

Terrence Fleming
US Environmental Protection Agency (WTR-2)
75 Hawthorne Street
San Francisco CA 94105

Phone: (415) 972-3462
FAX: (415) 947-3537
—— Forwarded by Terrence Fleming/R9/USEPA/US on 09/08/2009 04:13 PM ——
From: Terrence Fleming/R9/USEPA/US
To: rpurdy@waterboards.ca.gov
Date: 09/03/2009 05:17 PM
Subject: Selenium data from San Jose Creek

Hi Renee, I just wanted to let you know that we did some selenium analysis in San Jose Creek. The samples were from 5 "man-holes" that were in San Jose Creek. These are basically places where groundwater is exuding. We were actually surprised to find these things exuding in August (especially after several years of drought). In any event we took some samples and the selenium concentrations are generally between 10 and 20.

So a little history. We were trying to figure out where the non-POTW water was coming from. Phil Markel from LACSD put together this slide which shows that the river was gaining water between Pomona RC and Pomona RD.

Fact Sheet #5

Water Body: San Gabriel River Reach 1
Pollutant: Temperature, Water
Listing: List on 303(d) List (TMDL Required List)
Comment & Recommendation: Do Not List – Meets Water Quality Objective

The State Water Resources Control Board (State Board) is proposing that a new listing for impairment due to water temperature be made to the 303(d) list for Reach 1 of the San Gabriel River. The Sanitation Districts of Los Angeles County (Sanitation Districts) believe this proposed listing is inappropriate and recommend not listing due to water quality objectives being achieved.

Failure to Meet Water Quality Objectives Has Not Been Demonstrated

The Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) states that:

> "At no time shall these WARM-designated waters be raised above 80ºF **as a result of waste discharges**." [Emphasis added.]

In response to written comments, California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff state, "The 80°F temperature objective protects the aquatic life beneficial use of WARM in surface waters regardless of the ultimate source of the water in that reach of the river. The Los Angeles Water Board does not have different objectives for different seasons" and that "Analysis of sources and causes or identification of implementation measures to resolve or correct the impairment are not completed as part of the Integrated Report or 303(d) listing process." Furthermore, in Response to Comments #26.6, Regional Board staff state, "Exceedances in temperature may be caused in part by ambient temperature or exacerbated by the lack of tree cover in some reaches; exceedances may also be caused in part by waste discharge. The relative contribution of the causes of temperature exceedances is largely speculative, at this time." (emphasis added).

First, the 80°F temperature objective is not a hard and fast number that was set as a threshold above which aquatic life would not be protected. Rather the Basin Plan only prohibits the raising of water temperature above 80°F as a result of waste discharges. The Basin Plan accommodates temperatures above 80°F without considering them to be violations, as long they are not as a result of waste discharges. The standard was set this way presumably to recognize that there are natural variations in temperature in the Los Angeles Basin that may occur even in the absence of waste discharges. Note that objectives in the Basin Plan for pH and dissolved oxygen are written in the same way (i.e., including the language "as a result of waste discharges"), recognizing that these parameters may vary considerably due to natural factors. Also, while the Basin Plan does not have different objectives for different seasons, the Basin Plan language inherently recognizes natural variations in temperature by allowing them to exceed 80°F when it is not a result of waste discharge. The Southern California area routinely experiences temperatures well above 80°F during the summer months, and the Basin Plan was written to accommodate higher temperatures caused by these ambient conditions.

Additionally, the Sanitation Districts respect that source identification typically is not part of the 303(d) listing process for most pollutants. However, this water quality objective clearly distinguishes between exceedance of the 80ºF standard caused by "waste discharges" and those associated with other causes. In cases such as these, the burden falls on the Water Boards to demonstrate that temperature in excess of 80ºF were as a result of waste discharge before an impairment listing can be made. Based on the wording of the receiving water objective, a receiving water exceeding 80°F caused by factors other than wastes discharged would not represent an exceedance of the objective.

Therefore, when assessing the temperature objective in Region 4, an analysis of the source or cause is both required and critical in determining if the objective was exceeded. As detailed in the San Jose Creek Reach 1 Temperature Fact Sheet, in fully lined concrete channels, summertime excursions greater than the 80ºF are not caused by waste discharges but are due to elevated ambient air temperature, conductive and radiative heating associated with hardened landscapes, a lack of riparian cover, and increased ambient temperatures related to climate change. Although a specific survey for San Gabriel River Reach 1 has not been conducted, the physical conditions in that reach are very similar to those in San Jose Creek and would be expected to exhibit the same patterns (see figures 1-2). Furthermore, an analysis of ambient temperature correlated to receiving water temperature confirms this relationship and is described in more detail below. Finally, the proposed listing and associated fact sheets do not contain any analysis or evidence refuting the actuality that elevated temperatures are caused by factors such as elevated ambient temperatures and conductive and radiative heating associated with hardened landscapes.

Instead, the Regional Board Fact Sheet simply states that a single line of evidence was used in the assessment of temperature. Specifically, 93 of 234 samples from LC-R4, R3-1, and R3-1b exceeded the objective from July 2005 to November 2009 using the "Data for Various Pollutants in Various Water Bodies in Sanitation Districts of Los Angeles County, 2005-2010" dataset. Note that based on a review of the entire dataset utilized for the listing evaluation,[1] the Sanitation Districts identified 288 discrete temperature measurements, 117 of which exhibited a temperature that exceeded 80ºF. However, these temperature exceedances were not as a result of waste discharges, but were directly associated with high elevated ambient air temperatures as well as conduction and radiation (details below). Therefore, under the definition in the Basin Plan, no exceedances of the water quality objective were observed.

San Gabriel River Reach 1 Excursions Above 80 ºF Are a Result of Radiative and Conductive Heating

Tertiary treated water from the San Jose Creek and Los Coyotes Water Reclamation Plants (WRPs) is discharged to the main stem of the San Gabriel River. Reach 1 is a fully lined concrete channel from approximately 0.25 miles downstream of the San Jose Creek WRP discharge point 001 to the San Gabriel River estuary. As explained in Fact Sheet #4, elevated temperatures in Reach 1 of San Jose Creek occurred even in the absence of observable waste discharges and were caused by conductive heating through the concrete lining and solar radiation exposure. Although a comprehensive assessment of flows, in the absence of WRP discharge, cannot be conducted along the San Gabriel River, the same conditions associated with the radiative and conductive heating exist in San Gabriel River Reach 1. This is supported by a significant correlation between ambient air temperature and receiving water temperature ($R^2 = 0.61$, Figure 3)[2] and the fact that 90% of excursions above 80ºF in the receiving water environment occurred during summer months, between June and September. The weight of evidence supports the contention that receiving water temperatures above 80ºF were a result of ambient and environmental conditions (i.e., summer weather and a concrete channel) and not waste discharges.

[1] Data available from Los Angeles Regional Board at http://www.waterboards.ca.gov/water_issues/programs/tmdl/records/region_4/2010/ref3966.zip. Accessed 03/21/2017.

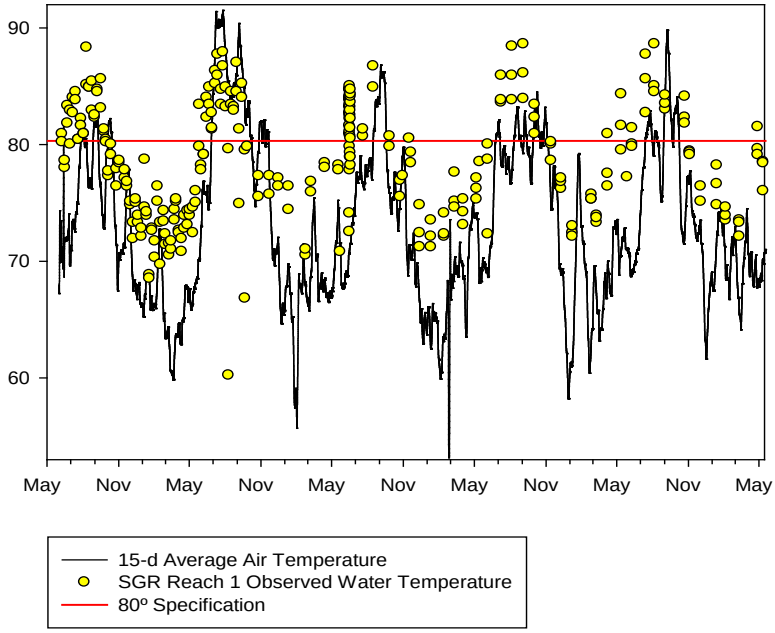
[2] PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, created 7 Apr 2017.

Fact Sheet #5

Figure 1. San Gabriel Reach 1 – Site R4

Figure 2. San Jose Creek Reach 1 – Site RC

Figure 3. Ambient Air Temperature vs. SGR Reach 1 Water Temperature



Fact Sheet #6

Water Body: San Gabriel River Reach 2
Pollutant: Temperature, Water
Listing: List on 303(d) List (TMDL Required List)
Comment & Recommendation: Do Not List – Meets Water Quality Objective

The State Water Resources Control Board (State Board) is proposing that a new listing for impairment due to water temperature be made to the 303(d) list for Reach 2 of the San Gabriel River. The Sanitation Districts of Los Angeles County (Sanitation Districts) believe this proposed listing is inappropriate and recommend not listing due to water quality objectives being achieved.

Failure to Meet Water Quality Objectives Has Not Been Demonstrated

The Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) states that:

> "At no time shall these WARM-designated waters be raised above 80ºF **as a result of waste discharges**." [Emphasis added.]

In response to written comments, California Regional Water Quality Control Board, Los Angeles Region (Regional Board) staff state, "The 80°F temperature objective protects the aquatic life beneficial use of WARM in surface waters regardless of the ultimate source of the water in that reach of the river. The Los Angeles Water Board does not have different objectives for different seasons" and that "Analysis of sources and causes or identification of implementation measures to resolve or correct the impairment are not completed as part of the Integrated Report or 303(d) listing process." Furthermore, in Response to Comments #26.6, Regional Board staff state, "Exceedances in temperature may be caused in part by ambient temperature or exacerbated by the lack of tree cover in some reaches; exceedances may also be caused in part by waste discharge. The relative contribution of the causes of temperature exceedances is largely speculative, at this time." (emphasis added).

First, the 80°F temperature objective is not a hard and fast number that was set as a threshold above which aquatic life would not be protected. Rather the Basin Plan only prohibits the raising of water temperature above 80°F as a result of waste discharges. The Basin Plan accommodates temperatures above 80°F without considering them to be violations, as long they are not as a result of waste discharges. The standard was set this way presumably to recognize that there are natural variations in temperature in the Los Angeles Basin that may occur even in the absence of waste discharges. Note that objectives in the Basin Plan for pH and dissolved oxygen are written in the same way (i.e., including the language "as a result of waste discharges"), recognizing that these parameters may vary considerably due to natural factors. Also, while the Basin Plan does not have different objectives for different seasons, the Basin Plan language inherently recognizes natural variations in temperature by allowing them to exceed 80°F when it is not a result of waste discharge. The Southern California area routinely experiences temperatures well above 80°F during the summer months, and the Basin Plan was written to accommodate higher temperatures caused by these ambient conditions.

Additionally, the Sanitation Districts respect that source identification typically is not part of the 303(d) listing process for most pollutants. However, this water quality objective clearly distinguishes between exceedance of the 80ºF standard caused by "waste discharges" and those associated with other causes. In cases such as these, the burden falls on the Water Boards to demonstrate that temperature in excess of 80ºF were as a result of waste discharge before an impairment listing can be made. Based on the wording of the receiving water objective, a receiving water exceeding 80°F caused by factors other than wastes discharged would not represent an exceedance of the objective.

Therefore, when assessing the temperature objective in Region 4, an analysis of the source or cause is both required and critical in determining if the objective was exceeded. As detailed in the San Jose Creek Reach 1 Temperature Fact Sheet, in fully lined concrete channels, summertime excursions greater than the 80ºF are not caused by waste discharges but are due to elevated ambient air temperature, conductive and radiative heating associated with hardened landscapes, a lack of riparian cover, and increased ambient temperatures related to climate change. Although a specific survey for San Gabriel River Reach 2 has not been conducted, the physical conditions in the most data rich portion of that reach are very similar to those in San Jose Creek and would be expected to exhibit the same patterns **(Figures 1-2).** The segments that are not fully lined are regularly dry in the absence of discharge or impounded stormwater and cannot support WARM freshwater habitat (Figure 3). Furthermore, an analysis of ambient temperature correlated to receiving water temperature confirms this relationship and is described in more detail below. Finally, the proposed listing and associated fact sheets do not contain any analysis or evidence refuting the actuality that elevated temperatures are caused by factors such as elevated ambient temperatures and conductive and radiative heating associated with hardened landscapes.

Instead, the Regional Board Fact Sheet simply states that a single line of evidence was used in the assessment of temperature. Specifically, 81 of 224 samples from SJC-R2 and SJC-R12 exceeded the objective from July 2005 to November 2009 using the "Data for Various Pollutants in Various Water Bodies in Sanitation Districts of Los Angeles County, 2005-2010" dataset. Note that based on a review of the entire dataset utilized for the listing evaluation,[1] the Sanitation Districts identified 81 excursions above 80 ºF out of 232 discrete temperature measurements at these two stations, not 224. However, these temperature exceedances were not as a result of waste discharges, but were directly associated with high elevated ambient air temperatures as well as conduction and radiation (details below). Therefore, under the definition in the Basin Plan, no exceedances of the water quality objective were observed.

San Gabriel River Reach 2 Excursions Above 80 ºF Are a Result of Radiative and Conductive Heating

Tertiary treated water from the San Jose Creek Water Reclamation Plant (WRP) is discharged to the main stem of the San Gabriel River. The lower ¼ mile of Reach 2 is a fully lined concrete channel, containing the R2 receiving water station. Data from this station represent 215 of 232 data points. As explained in Fact Sheet #4, elevated temperatures in Reach 1 of San Jose Creek occurred even in the absence of observable waste discharges and were caused by conductive heating through the concrete lining and solar radiation exposure (Figure 4)[2]. Although a comprehensive assessment of flows, in the absence of WRP discharge, cannot be conducted along the San Gabriel River, the same conditions associated with the radiative and conductive heating exist in this part of San Gabriel River Reach 2. This is further supported by the fact that 99% of excursions above 80 ºF in the receiving water environment occurred during the warmer months, June through October. The weight of evidence supports the contention that receiving water temperatures above 80 ºF were a result of ambient and environmental conditions (i.e., summer weather and a concrete channel) and not waste discharges.

[1] Data available from Los Angeles Regional Board at http://www.waterboards.ca.gov/water_issues/programs/tmdl/records/region_4/2010/ref3966.zip. Accessed 03/21/2017.

[2] PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, created 7 Jul 2017.

Fact Sheet #6

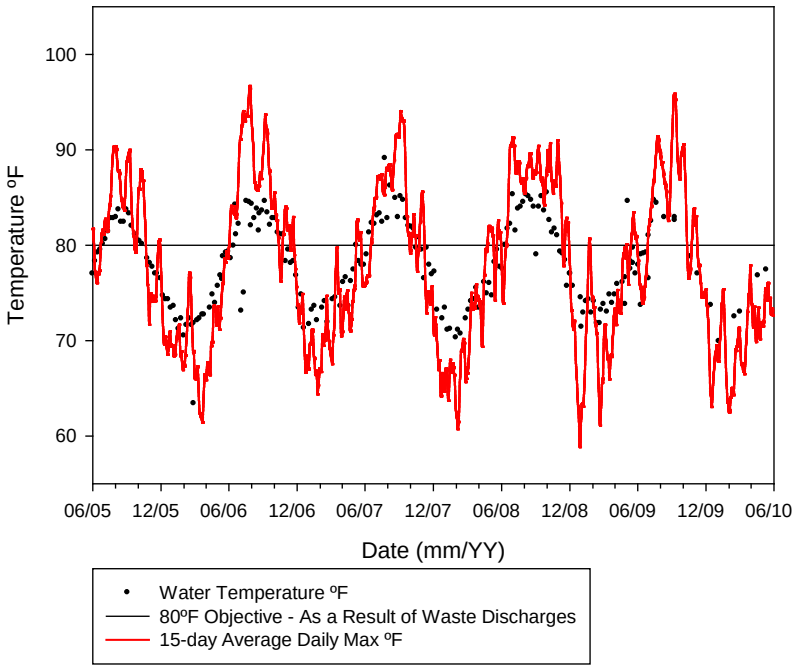
Figure 1. San Gabriel Reach 2 – Site R2

Figure 2. San Jose Creek Reach 1 – Site RC

Figure 3. San Gabriel Reach 2 – Site R12

Fact Sheet #6

Figure 4. Ambient Air Temperature vs. SGR Reach 2 Water Temperature



Fact Sheet #7

Water Body: Santa Clara River Reach 6
Pollutant: Temperature, Water
Listing: List on 303(d) List (TMDL Required List)
Comment & Recommendation: Do Not List

The State Water Resources Control Board (State Board) is proposing that a new listing for impairment due to water temperature be made to the 303(d) list for Reach 6 of the Santa Clara River. The Sanitation Districts of Los Angeles County (Sanitation Districts) believe this proposed listing is inappropriate and recommend not listing due to water quality objectives being achieved.

Failure to Meet Water Quality Objectives Has Not Been Demonstrated

The Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) states that:

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Therefore, when assessing the temperature objective in Region 4, an analysis of the source or cause is both required and critical in determining if the objective was exceeded. Warm weather excursions above 80ºF are frequently due to elevated ambient air temperature, conductive and radiative heating associated with hardened landscapes, a lack of riparian cover, and increased ambient temperatures related to climate change. Furthermore, an analysis of ambient temperature correlated to receiving water temperature identified a significant relationship between ambient air temperature and receiving water temperature in this Reach, as detailed below. Finally, the proposed listing and associated fact sheets do not contain any analysis or evidence refuting the findings of this survey.

Both the Saugus WRP discharge and the immediate downstream receiving water location (Sa-RB) are heavily influenced by ambient air temperature. Figure 3 includes a plot of the 15-day average values of the maximum air temperature along with the individual water temperature measurements collected at the Sa-RB location[1]. Nearly all of the 80°F temperature exceedances were associated with the higher, warm weather air temperatures and the two have a statistically significant correlation (R^2 = 0.76). Because exceedances of the Basin Plan temperature objective are limited to those "as a result of waste discharges," an evaluation of the contribution of ambient air temperature to the receiving water should have been conducted before identifying receiving water excursions above 80°F as exceedances of the objective.

The 80ºF Water Quality Temperature Objective Is Unnecessary and Inappropriate for Santa Clara River Reach 6

The only dry weather surface flows within this stretch of Reach 6 are associated with recycled water discharges from the Saugus WRP, which percolate into the dry riverbed a short distance downstream of the discharge point and eventually resurface downstream near the Reach 5 boundary. At the point of resurfacing, the water temperature averages 69°F and this perennial surface flow supports a diverse aquatic life community in Reach 5. However, the predominant natural condition of Reach 6 is dry and would not be expected to support any aquatic life without the Saugus WRP discharge. In addition, the cool temperatures in the water that resurfaces near the Reach 5 boundary demonstrate that elevated temperatures in the isolated discharge area are not detrimental to beneficial uses. Therefore, application of the 80°F water quality objective in Santa Clara Reach 6 is unnecessary and inappropriate, as the presence of water exceeding the 80°F water quality objective would not result in any impairment to naturally occurring aquatic life.

Mitigating the Elevated Temperature at Sa-RB Is Not Feasible

The only reasonable alternative to address the temperature water quality objective below the Saugus WRP at location Sa-RB during dry weather would be to eliminate the discharge through expansion of water recycling. However, it is highly unlikely that the California Department of Fish and Wildlife would support elimination of the entire discharge, because this action would remove all dry weather surface flows in the relevant section of Santa Clara Reach 6 and could potentially reduce the amount of resurfacing groundwater flows that actually support a diverse aquatic community in Santa Clara River Reach 5.

[1] PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, created 14 Mar 2017.

Fact Sheet #7

Figure 1. Sa-RB Temperature vs. Maximum Ambient Air Temperature (15-Day Average Value)