

**Flow Science Incorporated**

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Public Comment  
LA INDICATOR BACTERIA TMDL  
Deadline: 6/20/11 by 5:00 p.m.



June 20, 2011

Jeanine Townsend, Clerk of the Board  
State Water Resources Control Board  
P.O. Box 100  
Sacramento, CA 95812-2000  
commentletters@waterboards.ca.gov.



**Re: Comment Letter – Los Angeles Water Board Indicator Bacteria  
Los Angeles River Watershed Bacteria TMDL  
FSI 037033**

Dear Ms. Townsend,

On behalf of the Cities of Signal Hill and Downey, Flow Science is pleased to submit these comments on the subject TMDL.

Flow Science previously submitted detailed technical comments regarding the Los Angeles River Watershed Bacteria TMDL directly to the Regional Board. As detailed below, the Regional Board's response to comments was, for the more critical issues, largely non-responsive, and the Regional Board failed to resolve many of the critical technical deficiencies raised in the original comment letter submitted by this office. A number of these issues are discussed in detail in the attachment to this letter. Please note that the failure to discuss the responses to other comments (those not discussed in detail in the attachment) should not be interpreted as agreement with the Regional Board's responses to those comments; we disagree with many of the technical aspects of the TMDL and the Regional Board failed to address many of these issues as well.

The comments that are discussed in the attachment to this letter focus primarily on two key technical and policy issues, as follows:


- ***Natural/uncontrollable sources:*** regardless of the terms that are used, available data for dry weather conditions from the CREST process indicate that in-stream, non-human sources beyond the control of permittees are responsible for many of the observed exceedances of water quality criteria. The Regional Board maintains that the TMDL must be fully implemented (i.e., diversions and/or treatment and other measures must be constructed on an extensive basis) before TMDL revisions to address uncontrollable sources will be considered. Although the



- TMDL has used reference sites to establish an “allowable exceedance frequency,” we believe that the approach used to establish the exceedance frequency was flawed. We further believe that currently available evidence is more than sufficient to indicate that the implementation measures considered by the Regional Board (i.e., those that the Regional Board foresees that MS4 and other permittees may implement in an attempt to comply with the TMDL) will not result in attainment of water quality objectives within the receiving water.
- ***Wet weather TMDL compliance:*** The TMDL includes both a High Flow Suspension and allowable exceedance frequencies, which are intended to facilitate compliance during wet weather conditions. Flow Science analyzed available flow data for a single water year (2004-2005) and found that, even when the High Flow Suspension and allowable exceedance frequencies are taken into account, the volume of water that remains to be treated is well beyond the capability of currently known treatment and control measures. The Regional Board’s response to these comments has been that the 25-year implementation schedule allows sufficient time to develop implementation measures, and that measures such as flow diversions, treatment, infiltration, source reduction, water reuse, and SUSMP controls “can also significantly contribute to achieving [wet weather] WLAs.” However, the Regional Board has provided no evidence to support this assertion, and testimony at the TMDL adoption hearing confirmed that there is no known means of achieving compliance with the wet weather wasteload allocations.

We appreciate the opportunity to submit comments on the Los Angeles River Bacteria TMDL. Please contact us if you have any questions regarding these comments.

Sincerely,

  
Susan C. Paulsen, Ph.D., P.E.  
Vice President and Senior Scientist



**Flow Science's Technical Comments  
for the State Board's consideration of the  
Los Angeles River Watershed Bacteria TMDL**

**Flow Science is providing the following comments to the Regional Board's Response to Comments (July 2010) involving Flow Science's prior comment letter submitted to the Regional Board in June of 2010 in connection with the Los Angeles River Watershed Bacteria TMDL. The format below first summarizes Flow Science's original comment, followed by the Regional Board's response (in the July 2010 Response to Comments), and thereafter Flow Science's explanation of why the Regional Board's Response to Comments was either non-responsive, inadequate or incorrect. The Comment number references are to the numbering sequence set forth in the Regional Board's Response to Comments.**

**Comment 16.2**

- *Original comment:* Flow Science commented that compliance with the bacteria objectives in the TMDL would be difficult or impossible due to natural background contributions (e.g., bird and wildlife sources) and bacteria regrowth, and that "Bacteria concentrations are likely to exceed water quality objectives even in treated (disinfected) water just downstream of the point where it is discharged to receiving waters due to these natural and uncontrollable sources."
- *Regional Board response:* The Regional Board responded as follows: "As demonstrated by CREST's BSI study, bacteria are not likely to exceed water quality objectives just downstream of the point where treated (disinfected) water is discharged to receiving waters as a result of the dilution of the bacterial levels in the Los Angeles River below the outfalls of the wastewater treatment plants. It is important to note that 'natural' and 'uncontrollable' are terms which different stakeholders may define in different ways and are not, generally defined as overlapping terms."
- *Response to Regional Board response:* The Regional Board's response is inadequate for several reasons:
  - The Regional Board's claim that bacteria are not likely to exceed objectives as a result of dilution due to wastewater treatment plant discharge is unsupported. In fact, the water in the river is primarily treated wastewater, and concentrations of indicator bacteria frequently exceed standards downstream of wastewater discharges. Although concentrations at the discharge point of the wastewater plants are relatively low, concentrations rise significantly within the channel downstream of the discharge point, and the mass balance analysis performed for dry weather conditions by CREST indicates that inflows (i.e., storm drains and tributary inputs) are much smaller than the increases observed in the river.

- The Regional Board's response does not address the issues of natural sources or regrowth at all, which were the central issues in the comment.
- The definitions that could be assigned to the terms 'natural' and 'uncontrollable' are not relevant in this context. Rather, Flow Science's comment was intended to make clear that sources beyond any discharger's control (i.e., instream and non-human sources) result in many of the observed exceedances.

### **Comment 16.3**

- *Original comment:* Flow Science commented that “there are presently no technically feasible means of addressing bacteria in wet weather runoff. Regarding the wet weather TMDL, we note that neither the Regional Board nor stakeholders know of any technical means of complying with the TMDL under wet weather conditions.”
- *Regional Board response:* The Regional Board responded by referring to their response to comment 3.12 “for discussion of the wet weather TMDL.” In response to comment 3.12, the Regional Board made the following general assertions:
  - Diversion and treatment are not the only means of achieving wet-weather waste load allocations (WLAs); source reduction, SUSMP controls on new and redevelopment, water reuse, infiltration, and sewer line repair/isolation can also significantly contribute to achieving WLAs.
  - TMDL documents have been modified “to include the possibility of wet-weather load-based compliance at MS4 outfalls to attain the allowable number of exceedance days instream.”
  - A 25-year compliance period has been allowed in order to accommodate the admittedly difficult challenges associated meeting the wet weather WLAs.
- *Response to Regional Board response:* The Regional Board's responses are inadequate for several reasons:
  - Flow Science presented information on the volumes of flow that would need to be addressed in the river and its tributaries, even given the High Flow Suspension and the allowable exceedance days approach of the TMDL. The Regional Board has provided no data or information to suggest that the proposed alternative controls (e.g., diversion and treatment, source reduction, infiltration, water reuse, etc.) will be able to address these tremendously large volumes of water. As stated in our comments, and as indicated by the Board at the TMDL adoption hearing, there are currently no known means to handle these volumes of water and to achieve the wet weather WLAs.

- The claim that modifying TMDL documents “to include the possibility of wet-weather load-based compliance at MS4 outfalls to attain the allowable number of exceedance days instream” will help with wet weather TMDL compliance is not technically supportable. As noted by Flow Science (see detail of comment 16.3), wet-weather flow volumes are *too high* to allow permittees to achieve compliance with the wet weather WLAs. In addition, implementing diversion BMPs for wet weather throughout the watershed could result in significant risk of flooding given the amount of water that would need to be diverted. As noted in the TMDL Report, regular exceedances of bacteria criteria during wet weather conditions have occurred routinely in the past. No data or information is provided to indicate that allowing load-based compliance will result in TMDL attainment, as reducing loads would require reducing flows significantly or treating large volumes of water, which does not appear to be feasible.
- Emphasizing the 25-year compliance period does not address the fact that there are no technically feasible means of meeting the wet weather WLAs.

#### **Comment 16.9**

- *Original comment:* Flow Science commented that “only about 10-50% of the bacteria measured in Reach 2 of the Los Angeles River during six dry weather sampling events originated from storm drains and tributaries. This indicates that elimination of inflows to this reach, or elimination of bacteria in inflows, would not eliminate the exceedances of the water quality objectives for *E. coli*.”
- *Regional Board response:* The Regional Board responded as follows: “The CREST BSI study indicated that at that time, in-stream sources were important in Reach 2 and were relatively unimportant in Reach 4. However, a dramatic decrease in loadings to the river, as required by the interim WLA, from MS4 sources may, itself, change conditions in the river in terms of supporting large populations of fecal indicating bacteria in Reach 2. Reference streams, for example, while receiving occasional small loadings of fecal matter, do not maintain large in-stream sources of fecal indicating bacteria.”
- *Response to Regional Board response:* The Regional Board’s response is inadequate as follows:
  - The Regional Board’s response appears to suggest that in-stream sources of bacteria in Reach 2 may have been important *at the time of the CREST study*, but may not be important in the future if a “dramatic” decrease in loadings to the river occurs in the future. However, the CREST study demonstrates that dry weather inflows to the river provide only 10-50% of the total loading in the river itself. Thus, even if all inflows were

- eliminated (which would require extraordinary engineering and expenditures), 50-90% of current loadings would likely remain.
- The claim that a “dramatic” reduction in loading (even if achievable) to the river *may* change bacteria concentrations in the river is unsupported.
  - The CREST process did not examine wet weather loadings, so the Regional Board’s response appears to be applicable to the dry weather condition only.
  - Reference streams in virtually natural conditions are very different from concrete-lined river channels in a densely-populated urban environment. As discussed in the response to Comment 16.11, it appears that reference streams nearer the urban environment do contain bacteria from non-human sources at higher concentrations than more remote sites.
- *Regional Board response:* The Regional Board further responded to Flow Science’s comment above as follows: “First, the CREST BSI study concluded that *E. coli* from storm drains were causing exceedances “*As supported by the information below, it appears discharges of E. coli from storm drains and tributaries are potentially causing E. coli WQO exceedances, particularly in Reach 2. From this perspective the answer to Question 1a [Are storm drains and tributaries responsible for the significant bacteria loads entering Reach 2 and 4 of the LA River and causing E. coli WQO exceedances?] is a ‘probably yes’ for Reach 4 and ‘yes’ for Reach 2.*”
  - *Response to Regional Board response:* The Regional Board’s response is inadequate. Although it cites the conclusion of the CREST BSI study, i.e., that storm drain and tributary discharges are potentially causing exceedances of bacteria objectives, it does not respond to the actual argument Flow Science made based on the CREST data. Specifically, the fact that only 10-50% of the bacteria measured in Reach 2 originated from storm drains and tributaries (as demonstrated by the CREST data) suggests that the other 50-90% of the bacteria measured in Reach 2 come from different source(s) that would not be affected by reduction (or even elimination) of MS4 discharges. As such, exceedance of bacteria objectives are more plausibly attributed to non-storm drain sources. In short, even if storm drains and tributaries are considered a source of significant loads, there are other, much larger sources to the river; for this reason, even eliminating storm drain and tributary loads is not expected to result in attainment of water quality objectives within the receiving water.

### **Comment 16.9**

- *Original comment:* Flow Science commented as follows: “The fact that *E. coli* concentrations in this river segment [i.e., Reach 2] increased by more than an

order of magnitude while human-specific bacteroidales concentrations did not indicate that the *E. coli* in this segment are from non-human sources. These data indicate that non-human sources (which may include wildlife and birds, or re-growth in sediments) are likely responsible for the exceedances of water quality criteria in this river segment.”

- *Regional Board response:* The Regional Board responded as follows: “Second, the CREST BSI study concluded “*A lack of significant increase in human Bacteroidales concentrations along an LA River segment does not necessarily mean that zero human sources were impacting the LA River. Rather, it means that human sources were not strong enough to induce a detectable increase, or “signal”, in the LA River.*””
- *Response to Regional Board response:* The Regional Board’s response fails to address the main point of the comment, which is that non-human sources are far more important than (non-detectable) human sources in this reach of the river and are much more likely to be responsible for the observed exceedances of water quality criteria. As a result, TMDL measures that target human sources will not be effective in reducing indicator bacteria concentrations in the L.A. River, and are not expected to result in TMDL attainment.

#### **Comment 16.9**

- *Original comment:* Flow Science commented that studies on Aliso Creek (Orange County) and Cottonwood Creek (San Diego County) show that “even if stormwater or urban runoff were treated to meet water quality objectives for indicator bacteria, bacteria concentrations in those flows likely would increase due to natural sources even at short distances downstream of the treatment facility.”
- *Regional Board response:* The Regional Board responded as follows: “The Orange County Aliso Creek BMPs have found some conflicting results but that experience may not be typical. For instance in Marie Canyon, Malibu, Los Angeles County installed a UV treatment facility at the storm drain outfall to treat bacteria in late summer 2007. The facility was designed to filter and treat as much as 100 gallons per minute of dry weather runoff. While experiencing some initial problems, the pump ran 24 hours a day during the summer and winter dry weather period starting in October 2008. Water quality has improved substantially during dry weather and Marie Canyon beach waters are markedly improved.”
- *Response to Regional Board response:* The Regional Board’s response is inadequate. The Regional Board’s response infers that the study they cite (Marie Canyon) is more typical than the studies cited by Flow Science (Aliso Canyon and Cottonwood Creek). The point not addressed by the Regional Board response is that it is unclear (from the data) whether the extremely expensive treatment

measures that appear to be required by the TMDL will reduce bacteria concentrations in the stream.

### **Comment 16.10**

- *Original comment:* Flow Science commented that the Regional Board’s proposed “reference system approach” to regulating bacteria in the L.A. River “is problematic for several reasons. For example, dry weather flows in urban watersheds come from many sources, including POTW effluent, overland flows, and flows through storm drains (including NPDES-permitted flows), while dry weather flows in natural watersheds in southern California are often comprised mainly of groundwater inflow. Thus, there is less opportunity for the dry weather flows in natural watersheds to be exposed to natural sources of bacteria. In addition, the highly engineered environment of the storm drain/flood control system may be more conducive to bacteria growth and regrowth, as detailed above. As shown in the example of the CREST BSI study, natural sources are likely responsible for the exceedances in Reach 2 of the Los Angeles River, and natural sources may contribute significant amounts of indicator bacteria to other river reaches as well...As detailed below, we recommend that the Regional Board consider revising water quality objectives for bacteria to require compliance with *E. coli* objectives ‘as a result of controllable water quality factors.’”
- *Regional Board response:* The Regional Board responded as follows: “The Staff recommendation is not a natural source exclusion approach but a reference system approach. While the Basin Plan allows both approaches, the distinction is important...As shown in the CREST BSI study, *E. coli* from storm drains were causing exceedances in Reach 2. Natural rivers support habitat and wildlife and do not exceed the bacterial standards often. The reference approach used in this TMDL accounts for the natural level of exceedances. Should natural sources in this river account for a larger proportion of exceedances than in natural rivers then the Natural Source Exclusion approach can be pursued.”
- *Response to Regional Board response:* The Regional Board’s response is inadequate for several reasons:
  - Although the Board helpfully corrected Flow Science’s statement that the TMDL took a “natural sources exclusion approach”—in fact the TMDL takes a “reference system approach”—the Regional Board’s response did not address the problems with reference system approaches in urban watersheds, which the comment identified. Specifically, the comment suggested that there are many sources of dry-weather flow in southern California urban watersheds, whereas there is frequently only one source (groundwater flow) in southern California natural watersheds. As such, dry-weather flows are subject to *natural* sources of bacteria to a much greater extent in urban watersheds than they are in natural watersheds. Put



another way, *naturally generated* bacteria can find their way into urban channel flows from a much larger watershed area, and from a much wider range of sources, than is the case for natural channels. In addition, and as noted in the original comment, many natural streams in undeveloped watersheds exhibit regular exceedances of water quality criteria, even during dry weather (see discussion of Orange County coastal watersheds and streams in Flow Science 2005). Moreover, urban channels seem more conducive to natural bacteria growth and regrowth. Therefore, allowing an urban, concrete-lined flood control channel like the Los Angeles River no more natural bacteria than a reference stream that is far outside an urban area does not make sufficient allowance for the total quantities of bacteria from natural sources in the channel, i.e., bacteria that MS4 dischargers should not be responsible for controlling. The Regional Board's response did not address this issue.

- Due to the issues just pointed out, the Regional Board's comment that "natural rivers support habitat and wildlife and do not exceed bacterial standards often" is beside the point: for the reasons noted above, the comparison between natural rivers and urban channels is not appropriate.
- The Regional Board's comment that the CREST study shows that bacteria exceedances in Reach 2 are caused by storm drain discharges is inaccurate. As pointed out in Comment 16.9, only 10-50% of bacteria in Reach 2 (6<sup>th</sup> St. to Slauson Ave.) are from storm drains. The other 50-90% are from non-storm-drain sources. As discussed above, the fact that indicator bacteria concentrations increased by more than one order of magnitude in Reach 2 while bacteroidales concentrations did not suggests that bacteria from non-human sources are causing the exceedances. In short, natural non-storm-drain sources seem to be responsible for exceedances in Reach 2.
- The Regional Board suggests that if it could be shown in the future that natural sources of indicator bacteria account for a larger proportion of exceedances than in reference streams, then the "Natural Source Exclusion" approach could be pursued. However, this response overlooks the fact that there is *already* ample evidence indicating that natural sources *do* account for a larger proportion of exceedances than in reference streams (e.g., evidence from Reach 2, as discussed above, and which indicates that 100% of the monitored events exceeded criteria, and that increases in bacteria were from non-human sources). As such, the Board should apply a well-conceived Natural Source Exclusion approach *now*, i.e., one that properly accounts for the quantity of bacteria in the L.A. River from natural sources, and that requires compliance with *E. coli* objectives based on this proper accounting.

### Comment 16.11

- *Original comment:* Flow Science commented that “the methods used to arrive at the [allowable reference site] exceedance frequency are very unclear. The cited SCCWRP study (Tiefenthaler *et al.* 2008) states that four sites (instead of three sites) were excluded from the calculation of exceedance probabilities; ‘four sites originally considered, but later rejected from the study...[because these sites were] subject to agricultural or transportation related runoff...in one instance, a portion of the contributing watershed was affected by a recent fire’ (p. 9 of Tiefenthaler *et al.* 2008). It is impossible to find out which sites were excluded in the cited SCCWRP study, which provides neither explanation nor a complete dataset. The complete dataset should be available to the public for review because reference exceedance probabilities could change significantly if the excluded three (or four) sites are instead included in the reference dataset.”
- *Regional Board response:* The Regional Board responded as follows: “The sites were removed from analysis because of the potential of anthropogenic sources of bacteria such that they were not considered true reference sites.”
- *Response to Regional Board response:* The Regional Board’s response is inadequate. The thrust of Flow Science’s comment was to point out that the complete data set that formed the basis of the reference watershed exceedance probability was not made available to the public and should be made available. The Regional Board response did not address this comment and we have not received the dataset upon which this analysis was based. Further, as noted below, the available information does not appear to indicate that there is an anthropogenic contribution or signal for the excluded samples.
- *Original comment:* Flow Science commented as follows: “Perhaps most importantly, the SCCWRP study (Tiefenthaler *et al.* 2008) used bacteroidales analysis to demonstrate that exceedances at the reference sites were due to non-human sources. It is inappropriate and scientifically unsound to exclude sites where exceedances were due to non-human sources and to estimate exceedance probabilities based on the rest of the sites. Thus, the method used to calculate an "allowable exceedance frequency" for the Draft TMDL was flawed.”
- *Regional Board response:* As noted above, the Regional Board responded as follows: “The sites were removed from analysis because of the potential of anthropogenic sources of bacteria such that they were not considered true reference sites.”
- *Response to Regional Board response:* The bacteroidales analysis conducted in the SCCWRP study showed that exceedances at the reference sites were due to non-human sources, and so removal of the sites on the basis of anthropogenic influence was inappropriate. Thus, the Regional Board did not give an adequate

reason for why the sites were removed, and, as noted above, the dataset has not been provided.

#### **Comment 16.12**

- *Original comment:* The original comment stated that because in-stream and natural sources are very large in certain reaches (e.g., 50-90% of the bacteria load in a portion of Reach 2), a natural source exclusion approach was warranted.
- *Regional Board response:* The Regional Board responded that “if the dischargers to these reaches can design and implement LRS [load reduction strategy] programs to meet interim WLAs, then they will have fully or largely controlled the anthropogenic sources to the river and a natural sources exclusion approach may, in fact, be feasible.”
- *Response to Regional Board response:* Existing information is sufficient to warrant a natural sources exclusion approach now; unnecessary resources and expenditures will likely occur if such an approach is not adopted at this time.

#### **Comment 16.14**

- *Original comment:* Flow Science commented as follows: “Of significant concern is how implementation would proceed, and how compliance with the TMDL will be determined. Frequently, both dry and wet weather flows from multiple jurisdictions drain to a single storm drain to the River, and water frequently flows serially through drains in multiple cities before entering the County Flood Control system and finally the Los Angeles River. MS4 permittees in these jurisdictions may choose to implement different measures to control bacteria, and thus may be subject to different compliance schedules. It is unclear how compliance would be determined for these jurisdictions. Complicating matters is the fact that bacteria often behave erratically, and high concentrations of bacteria may be observed only once in a given location, yet the potential exists with the current TMDL that these “outlier” or “anomaly” occurrences of high bacteria concentrations may lead to exceedances of objectives, and consequently to permit violations or TMDL nonattainment.”
- *Regional Board response:* The Regional Board responded as follows: “See response to comment 11.4 and changes to BPA for more clarification on compliance.”
- *Response to Regional Board response:* The Regional Board response is inadequate for several reasons:
  - The Regional Board response to comment 11.4 (to which the response to 16.14 refers) essentially says that language has been added to the BPA to clarify compliance with the TMDL for “good actor” dischargers, who

might be wrongly impugned for the bacteria-generating activities of upstream dischargers. However, this response does not address the two issues raised in comment 16.14, i.e., how compliance will be determined for two or more MS4 permittees that share storm drains but that use different implementation measures, and thereby have different compliance schedules; and how anomalously high “outlier” bacteria samples will be handled with respect to compliance.

- Second, the Regional Board has not shown, in its response, that the edits to the BPA address the issues raised in comment 16.14, and in fact they do not address the issues.

### **Comment 16.16**

- *Original comment:* Regarding environmental impacts, “the way the Draft TMDL is currently crafted, significant treatment processes, including ultraviolet (UV) sterilization or other disinfection treatment methods, could be required in order to meet the TMDL targets instream.” Flow Science asserted that these treatment methods could greatly increase energy use, introduce chemicals for treatment, require construction of significant on-site storage, and cause other potentially significant environmental impacts.
- *Regional Board response:* The Regional Board responded that there is “thin evidence that bacteria levels rebound after treated water is discharged to natural channels.” The Regional Board also asserted that “sufficient flexibility is afforded by this TMDL in time and other approaches are available. In some watersheds, localized treatment may be a valuable implementation measure to include in a Load Reduction Strategy or other implementation plan.”
- *Response to Regional Board response:* The response fails to address the potentially significant environmental impacts that were raised. The response acknowledges that “eliminating, minimizing, or treating flows” may be part of implementation, but does not address the concerns about the potentially significant environmental impacts of the possible treatment and control measures.

### **Comment 16.18**

- *Original comment:* This comment asserted that a wet weather TMDL is not feasible at this time because of uncontrollable sources, the lack of recreational activity during high flow conditions, and the volume of flow in the river and tributaries during wet weather conditions. The comment provided detailed discussion of flow rates and flow volumes for wet weather events, which are extraordinarily large (see original comment for detail). The comment concluded

that “we are unaware of any viable strategy that could be used to treat storm flow volumes on the order of one billion gallons per day.”

- *Regional Board response:* The response stated that “diversion and treatment can contribute to achieving the wet-weather WLAs, especially with some retention of wet weather flows, source reduction, SUSMP controls on new and re-development, and greater water re-use and infiltration can significantly contribute to achievement of the wet weather WLAs, also.” The Regional Board response also noted the 25-year implementation period and noted that dry weather implementation measures “will help meet wet weather goals.”
- *Response to Regional Board response:* The Regional Board’s response fails to address the problems posed by the large volumes of water that would need to be addressed. The Regional Board provides no analysis (quantitative or qualitative) to suggest that they have considered the volumes of water or flow rates that could be intercepted and/or treated by the various measures. The Regional Board does not assert that compliance with the wet weather TMDL is achievable, and further fails to account for other significant problems that may arise from diverting large quantities of water *away* from a major flood control channel, e.g., flooding.

#### **Comment 16.19**

- *Original comment:* Flow Science asserted that the estimate of cost to comply with the wet weather TMDL (a total of \$5.4 billion for TMDL compliance) is at best a guess and does not examine feasible methods of compliance.
- *Regional Board response:* “The \$5.4 billion figure is the upper end of the range and was specifically included in an abundance of caution to be sure to include a “highest possible” cost estimate...Responsible parties have sufficient flexibility to develop a plan to include diversion and source reduction or treatment that considers costs and avoids the less cost-effective projects.”
- *Response to Regional Board response:* The response fails to address whether or not methods even exist to achieve compliance with the wet weather TMDL. As noted in the prior comments, there is no evidence to suggest that anyone (including the Regional Board) is aware of any means to comply with the wet weather components of the TMDL. The Regional Board staff report's estimate of \$5.4 billion is at best a guess, and does not examine or even identify feasible methods of compliance with the wet weather WLAs.

#### **Comment 16.20**

- *Original comment:* Flow Science recommended that water quality objectives for indicator bacteria be amended to require control of bacteria "as **a result of controllable water quality factors.**" The comment provided significant detail

regarding how this concept could be implemented, and recommended that these changes be made prior to adoption of the TMDL.

- *Regional Board response:* The Regional Board referred to prior responses to comments 16.2 and 16.11 (regarding application of the natural sources exclusion) but otherwise did not address the issue of revising water quality criteria prior to adopting the TMDL.
- *Response to Regional Board response:* Flow Science has suggested in a number of venues on multiple occasions that water quality criteria need to be revised to require control of bacteria “as a result of controllable water quality factors,” but the Regional Board has repeatedly suggested that such amendments are outside the scope of the action at hand. For example, the Basin Plan amendment to remove fecal coliform objectives, adopted the day before this TMDL was adopted, was said by Regional Board staff to have been scoped so narrowly that this change could not be considered. Flow Science respectfully suggests to the State Water Board that this change to objectives is necessary to avoid unnecessary expenditures of resources to intercept and/or treat indicator bacteria from sources beyond a discharger’s control. The Regional Board’s response did not adequately address or resolve the comment.

### **Comment 16.21**

- *Original comment:* Flow Science noted that Reaches 1 and 2 of the Los Angeles River are highly modified, such that recreational use is infrequent, dangerous, and illegal. The channel along Reaches 1 and 2 and tributaries are fenced and public access is restricted, and it is unsafe even during dry weather to be in the low flow channel. Because of the extensive hardening and channelization of the river, the designated beneficial uses of the river should be re-evaluated prior to TMDL adoption to ensure that resources are spent where the risk to human health is greatest - i.e., at the beaches and other designated swimming areas that have significant levels of legal water contact recreation.
- *Regional Board response:* The Regional Board referred to the response to comments 3.2 and 3.5, which cited the 25-year implementation time frame and stated that changes to beneficial uses could be made on a case-by-case basis during that timeframe. The Regional Board response also cited the exceedance days approach and the High Flow Suspension.
- *Response to Regional Board response:* As noted throughout this comment letter, it is our opinion that the High Flow Suspension, exceedance days approach, and long implementation timeframe do not result in a TMDL that can feasibly be achieved, particularly for the wet weather condition, when flow volumes are very large. At the TMDL adoption hearing on July 9, 2010, the Regional Board members requested that Regional Board staff conduct use assessments to determine if recreation was occurring in channels subject to the TMDL.



Testimony at the TMDL adoption hearing indicated that Regional Board members had concerns about the ability to comply and the cost of compliance, but chose to adopt the TMDL then conduct the use surveys following TMDL adoption. However, as indicated in the attachment to this letter (Attachment 2), we have serious concerns about the process that is underway (the "RECUR" process) to evaluate beneficial uses within the Los Angeles River watershed. We continue to believe that it is more appropriate to evaluate uses and make changes if/as necessary prior to adoption of the TMDL.

**Flow Science Incorporated**

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June 17, 2011

California Regional Water Quality Control Board, Los Angeles Region  
320 W. 4<sup>th</sup> Street, Suite 200  
Los Angeles, CA 90013

Attention: Renee Purdy  
Ginachi Amah

**Subject: Further Comments on Los Angeles River Recreational use Re-Evaluation (RECUR) Process**  
FSI 037033

Dear Ms. Purdy and Dr. Amah,

Flow Science, on behalf of the Cities of Signal Hill and Downey, has prepared this letter to follow up on ongoing concerns that we have with the RECUR process to re-evaluate the appropriateness of the recreational beneficial uses currently designated in the Basin Plan for the Los Angeles River Watershed, including concerns with the designated “existing” beneficial uses. The Cities sincerely appreciate the responsiveness of the Regional Board to stakeholder concerns in initiating a project to re-evaluate beneficial uses within the Los Angeles River watershed, but are concerned about the direction of the process that is currently underway; we believe that one of the primary concerns behind the Regional Board’s direction at the July 9, 2010 hearing involved the appropriateness of designating major concrete-lined flood control channels for recreational use. We therefore believe it is necessary to consider the correctness of these designations in the Basin Plan, and to specifically evaluate the particular physical and aesthetic characteristics of the body, including (but not limited to) channel configuration and characteristics, access, signage, and fencing.

Flow Science submitted written comments on November 19, 2010, regarding the work plan to re-evaluate recreational uses in the Los Angeles River Watershed (work plan dated October 18, 2010), which was prepared as part of the Board’s RECUR process. Flow Science also provided a number of documents to Regional Board staff in a letter dated September 27, 2010, that we asked be considered both as part of the development of the project work plan and when results from the planned study are interpreted and used to guide future actions.

As noted in our prior correspondence with the Board, and as noted in verbal comments made by us and by others at the both the September 27, 2010, and October 26,





2010, and subsequent meetings, the goals and objectives of the current project are unclear. In our prior correspondence, we respectfully suggested that the following information be clearly stated in the work plan:

- Goals and objectives for the current project
- Additional planned phases that will occur subsequent to the current project (to include, but not be limited to, development of recommendations for UAA development; extension of analyses to non-engineered channels; evaluations of the impacts of beneficial uses together with water quality objectives)
- Decision criteria to be applied by Regional Board staff to data from this study

We also noted concerns that Regional Board staff were, by default, making policy decisions that should be brought before the Regional Board members. For example, there was a significant amount of discussion about what constitutes an “existing use.” Several stakeholders asserted that the presence of people within the channel, but not in contact with the water, did not necessarily indicate that REC-1 was an “existing use” of the water body. Similarly, several stakeholders asserted that the isolated occurrence of an activity within a water (e.g., a single person bathing within a reach on only one occasion) did not necessarily indicate that REC-1 is an “existing use” of the water body. It is our belief that the process must include an evaluation of the physical and environmental characteristics of the water body itself, including the appropriateness of people swimming or otherwise recreating in large, concrete-lined flood control channels. The current project does not appear to address this prime concern, which, again, seemed to be of central importance to the Regional Board at the hearing last July.

Stakeholders also expressed concern that the REC-1 designated uses in the Basin Plan, and the information to be gathered during the RECUR process, do not correspond to or account for the definitions used by USEPA in developing the water quality criteria that are applied to REC-1. The epidemiological studies that were conducted to develop the E. coli objectives for contact recreation surveyed swimmers with wet hair and assumed an ingestion rate of 100 ml, conditions that are unlikely to occur with activities such as wading.

In order for the results of the study to be meaningful and widely accepted, there needs to be broad agreement (not necessarily consensus) on the information needed to meet the goals and objectives of the study, and on how this study fits in with other potential future components or phases. The work plan should collect such data as all parties believe to be necessary to answer the questions to be addressed by the current study, and to support future phases of work. Note that this does not mean that all parties shall agree upon the meaning or interpretation of those data, only that data collection should be inclusive enough to provide the information the stakeholders believe necessary for Regional Board members to make informed, reasoned policy decisions.

The October 2010 draft work plan that was issued for the project has apparently not been updated to address the significant concerns expressed by stakeholders. We were



told at a meeting at the Regional Board's offices on June 7, 2011, that data collection is proceeding at the direction of the Board's management, and that a final work plan will not be developed for the project.

At this time, we would ask that the stakeholders concerns be addressed in the process, and that a final workplan be prepared outlining the process with these concerns in mind before any substantive work continues on the study.

Thank you for the opportunity to provide comments. Please contact me if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Susan C. Paulsen". The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Susan C. Paulsen, Ph.D., P.E.  
Vice President and Senior Scientist

cc: Sam Unger, Executive Officer