



Linda S. Adams  
Secretary for  
Environmental  
Protection

# California Regional Water Quality Control Board Central Valley Region

Robert Schneider, Chair



Arnold  
Schwarzenegger  
Governor

**Sacramento Main Office**

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114  
Phone (916) 464-3291 • FAX (916) 464-4645  
<http://www.waterboards.ca.gov/centralvalley>

**TO:** Gerald W. Bowes, Ph.D.,  
Staff Toxicologist (Sup.)  
Manager, Toxicology and Peer  
Review Section  
Division of Water Quality  
State Water Resources Control  
Board

**FROM:** Ken Landau  
Assistant Executive Officer  
Regional Water Quality Control  
Board, Central Valley Region

**SIGNATURE:**

**DATE:** 27 October 2006

**SUBJECT:** EVALUATION OF NEED FOR SCIENTIFIC PEER REVIEW OF THE  
SACRAMENTO AND FEATHER RIVERS DIAZINON AND CHLORPYRIFOS  
BASIN PLAN AMENDMENT

This memo serves to document Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff's understanding of the applicability of, and compliance with, Health and Safety Code Section 57004 (HSC 57004) peer review requirements as it pertains to the proposed Basin Plan Amendment to control discharges of Diazinon and Chlorpyrifos into the Sacramento and Feather Rivers (the Proposed Amendment).

**Background:**

In 2003, the Central Valley Water Board issued resolution R5-2003-0148, which approved a Basin Plan Amendment establishing diazinon water quality objectives, total maximum daily loads (TMDLs) and implementation plans for diazinon in the Sacramento and Feather Rivers (Original Amendment). The amendment was peer reviewed and staff responded to peer review comments in accordance with HSC 57004 requirements. The Original Amendment has been approved by the State Water Resources Control Board (State Water Board), the Office of Administrative Law (OAL) and the US EPA, and serves as the baseline language for the proposed amendment.

The Original Amendment included the requirement to review the diazinon allocations and the implementation provisions in the Basin Plan at least once every 5 years, beginning no later than June 30, 2007. The Proposed amendment is being prepared to meet this review requirement and respond to a Superior Court Order. The Proposed Amendment also has the goal to establish programmatic consistency between watersheds by establishing water quality objectives and implementation plans for chlorpyrifos in addition to diazinon.

Since approval and adoption of the Original Amendment, new information has been provided to the Central Valley Water Board staff that calls into question some of the data used to establish diazinon water quality objectives. The Original Amendment

adopted the California Department of Fish and Game (CDFG) diazinon criteria as the water quality objective. The new information showed that the dataset used by CDFG included a toxicity value that was incorrectly reported in the literature. Central Valley Water Board staff recalculated the diazinon criteria using a corrected dataset that excluded the questionable data point. After correction, the new water quality criteria are approximately twice the original criteria.

In 2005 and 2006, the Central Valley Water Board adopted two other Basin Plan amendments that are relevant to the current project. In 2005, the Central Valley Water Board issued resolution R5-2005-0138 to control diazinon and chlorpyrifos in the San Joaquin River (the San Joaquin River Amendment). In 2006, the Central Valley Water Board issued resolution R5-2006-0061 to control diazinon and chlorpyrifos in the Sacramento-San Joaquin Delta (the Delta Amendment). Both Amendments adopted the new diazinon criteria, calculated using the corrected data set, as diazinon water quality objectives.

The San Joaquin River Amendment has been approved by the State Water Board and OAL and is currently awaiting approval by the US EPA. The Delta Amendment is awaiting approval by the State Water Board, OAL and the US EPA. Both amendments were peer reviewed, and included staff response to peer review comments, in accordance with HSC 57004. Work performed and peer reviewed under these amendments, as well as work performed as part of the Original Amendment, has been applied to the Sacramento and Feather Rivers as part of the Proposed Amendment.

### **Legal Basis for Peer Review**

According to the Health and Safety Code, section 57004(d):

*“No board, department, or office within the agency shall take any action to adopt the final version of a rule unless [the Board] submits the scientific portions of the proposed rule, along with a statement of the scientific findings, conclusions, and assumptions on which the scientific portions of the proposed rule are based and the supporting scientific data, studies, and other appropriate materials, to the external scientific peer review entity for its evaluation.”*

The State Water Board Administrative Procedures Manual (APM) Section 8, III.D. clarifies that

*“Peer review is not needed for source documents that have been previously peer reviewed by a recognized expert or body of experts.*

In addition the Peer Review Guidance (Bowes 2004) clarifies that:

*“There are several circumstances where work products do not require review peer review under [HSC 57004], including:*

*A particular work product that has been peer reviewed with a known record by a recognized expert or expert body. Additional peer review is not required if a new*

*application of an adequately peer reviewed work product does not depart significantly from its scientific approach."*

## Evaluation of Need for Peer Review

Table 1 provides a list of the scientific elements of the Proposed Amendment and identifies the previous amendments that were used as a source in developing the Proposed Amendment. As shown, all of the previous Basin Plan Amendments qualify as source documents that have been previously peer reviewed by a recognized expert or body of experts. As such, scientific portions of the Proposed Amendment and aspects of its scientific basis have been through a complete peer review process in accordance with HSC 57004.

**TABLE 1**  
**SUMMARY OF PEER REVIEW OF SCIENTIFIC BASIS OF BASIN PLAN**  
**AMENDMENT ELEMENTS**

Proposed Amendment Element	Proposed Approach	Prior Scientific Peer Review
Diazinon and Chlorpyrifos Water Quality Objectives	Adopt as Water Quality Objectives diazinon and chlorpyrifos water quality criteria derived by staff using the US EPA methodology and the Revised CDFG Dataset	<ul style="list-style-type: none"> <li>• San Joaquin River Amendment</li> <li>• Delta Amendment</li> </ul>
Loading Capacity	Additivity formula sums the ratios of the concentration of each pesticide to their respective water quality objectives. Sums greater than one exceed the narrative toxicity objective.	<ul style="list-style-type: none"> <li>• San Joaquin River Amendment</li> <li>• Delta Amendment</li> </ul>
Allocation methodology	Allocations are set equal to the loading capacity	<ul style="list-style-type: none"> <li>• San Joaquin River Amendment</li> <li>• Delta Amendment</li> <li>•</li> </ul>
Monitoring	Add chlorpyrifos as a pesticide that must be included in a monitoring program	<ul style="list-style-type: none"> <li>• San Joaquin River Amendment</li> <li>• Delta Amendment</li> <li>•</li> </ul>

In addition to relying on the previously peer reviewed Basin Plan Amendments as source documents, the Proposed Amendment also utilized the same scientific approach. The following is a list of elements of the proposed Amendment and how the scientific approach is equivalent to the previously peer reviewed Basin Plan Amendments.

### 1. Diazinon and chlorpyrifos water quality objectives.

The US EPA methodology for deriving criteria, used in the Original Amendment and also in the San Joaquin River and Delta Amendments, has been applied to this Basin Plan Amendment. The recommended diazinon and chlorpyrifos water quality objectives for the Proposed Amendment are based on a recalculation of the California Department of Fish and Game's (CDFG) diazinon and chlorpyrifos water quality criteria (Siepmann and Finlayson, 2000). Central Valley Water Board staff generally followed the US EPA guidance on the derivation of criteria for the protection of aquatic life (USEPA, 1985). The water quality objectives for the Proposed Amendment are identical to the Delta and San Joaquin River objectives. As with the San Joaquin River and Delta Amendments,

the criteria were recalculated to utilize a revised dataset and to express the criteria to two significant figures, consistent with the USEPA guidance. As with the San Joaquin River and Delta Amendments, the frequency with which the criteria can be exceeded has been changed from the USEPA guidance recommendation of once every three years on the average to once every three-year period to simplify evaluation of compliance.

## 2. Loading capacity

The approach to setting the loading capacity used in the San Joaquin River and Delta Amendments is also proposed for the Sacramento and Feather Rivers. Specifically, the Proposed Amendment sets the loading capacity equal to the existing additive formula, which accounts for the additive effects of chemicals with the same mode of action. The formula sums the ratios of the concentration of each pesticide in the water body to the applicable objective for that pesticide. A sum of greater than one (1) indicates that applicable narrative objectives are not met. The additive formula is applied to both the loading capacity and allocations (i.e. the sum of the ratio of the concentrations). This is the identical approach that was taken with the San Joaquin and Delta Amendments.

## 3. Allocation methodology

Allocations are proposed to be set equal to the loading capacity. This approach is identical to the peer reviewed approach used in the San Joaquin River and Delta Amendments.

## 4. Monitoring

The current Basin Plan as amended by the Original Amendment defines goals for required monitoring to determine whether the water quality objectives and load allocations are being met. The only proposed change in the Proposed Amendment compared to the Original Amendment is the policy decision to explicitly include chlorpyrifos as one of the pesticides to monitor. The recommended approach has been peer reviewed in the Original Amendment and in the San Joaquin and Delta Amendments.

## **Conclusion**

Based on Staff's understanding of HSC 57004 and APM Section 8, III. D., staff has determined that the scientific portions and scientific basis of the Proposed Amendment to control discharges of diazinon and chlorpyrifos into the Sacramento and Feather Rivers are based on source material that has already been peer reviewed. The Proposed Amendment is itself just a new application of earlier, adequately peer reviewed work products. As shown above, it does not depart from the scientific approach of the other Basin Plan Amendments from which it is derived. As such, the proposed amendment has already satisfied the peer review requirement of HSC 57004 and, therefore, does not require additional peer review.

Should you have any comments or questions about this assessment, please contact either Paul Hann at (916) 464-4628 or phann@waterboards.ca.gov or Joe Karkoski at (916) 464-4668 or jkarkoski@waterboards.ca.gov.

**References:**

- Beaulaurier, D., G. Davis, J. Karkoski, M. McCarthy, D. McClure, M. Menconi. 2005. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Diazinon and Chlorpyrifos Runoff into the Lower San Joaquin River. California Regional Water Quality Control Board, Central Valley Region. Sacramento, CA.
- Bowes, Gerald W. State and Regional Board External Scientific Peer Review Process: Review and Update. Guidance Memorandum prepared by Gerald Bowes (Manager, Toxicology and Peer Review Section, Division of Water Quality, State Water Resources Control Board) dated October 1, 2004.
- Karkoski, J., G. Davis, J. Dyke, D. McClure, and M. Menconi. 2003. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Orchard Pesticide Runoff and Diazinon Runoff into the Sacramento and Feather Rivers. California Regional Water Quality Control Board, Central Valley Region. Sacramento, CA.
- McClure, D., G. Davis, J. Karkoski, P. Lee. 2005. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento and San Joaquin Delta. California Regional Water Quality Control Board, Central Valley Region. Sacramento, CA.
- Siepmann, S. and B.J. Finlayson. 2000. Water quality criteria for diazinon and chlorpyrifos. California Department of Fish and Game. Office of Spill Prevention and Response Administrative Report 00-3. Sacramento, CA.
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TO: Gerald W. Bowes, Ph.D.,  
Staff Toxicologist (Sup.)  
Manager, Toxicology and Peer  
Review Section  
Division of Water Quality  
State Water Resources Control  
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FROM: Ken Landau  
Assistant Executive Officer  
Regional Water Quality Control  
Board, Central Valley Region

SIGNATURE: 

DATE: 9 November 2006

SUBJECT: EVALUATION OF NEED FOR SCIENTIFIC PEER REVIEW OF THE  
SACRAMENTO AND FEATHER RIVERS DIAZINON AND CHLORPYRIFOS  
BASIN PLAN AMENDMENT

This memo serves to document Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff's understanding of the applicability of, and compliance with, Health and Safety Code Section 57004 (HSC 57004) peer review requirements as it pertains to the proposed Basin Plan Amendment to Control Discharges of Diazinon and Chlorpyrifos into the Sacramento and Feather Rivers (the Proposed Amendment). This memo replaces the memo dated 27 October 2006, which we previously sent to you. We had mistakenly indicated that the USEPA guidance was "generally" followed in the proposed and the previous Amendments. In fact, the US EPA Guidance for calculating aquatic life criteria was strictly followed.

### Background:

In 2003, the Central Valley Water Board issued resolution R5-2003-0148, which approved a Basin Plan Amendment establishing diazinon water quality objectives, total maximum daily loads (TMDLs) and implementation plans for diazinon in the Sacramento and Feather Rivers (Original Amendment). The Original Amendment was peer reviewed and staff responded to peer review comments in accordance with HSC 57004 requirements. The Original Amendment has been approved by the State Water Resources Control Board (State Water Board), the Office of Administrative Law (OAL) and the US EPA, and serves as the baseline language for the Proposed Amendment.

The Original Amendment included the requirement to review the diazinon allocations and the implementation provisions in the Basin Plan at least once every 5 years, beginning no later than June 30, 2007. The Proposed Amendment is being prepared to meet this review requirement and respond to a Superior Court Order. The Proposed Amendment also has the goal to establish programmatic consistency between watersheds by establishing water quality objectives and implementation plans for chlorpyrifos in addition to diazinon.

Since approval and adoption of the Original Amendment, new information has been provided to Central Valley Water Board staff that calls into question some of the data used to establish the diazinon water quality objectives. The Original Amendment adopted the California Department of Fish and Game (CDFG) diazinon criteria as the water quality objective. The new information showed that the dataset used by CDFG included a toxicity value that was incorrectly reported in the literature. Central Valley Water Board staff recalculated the diazinon objectives using a corrected dataset that excluded the questionable data point. After correction, the new water quality objectives are approximately twice the original objectives.

In 2005 and 2006, the Central Valley Water Board adopted two other Basin Plan amendments that are relevant to the current project. In 2005, the Central Valley Water Board issued resolution R5-2005-0138 to control diazinon and chlorpyrifos in the San Joaquin River (the San Joaquin River Amendment). In 2006, the Central Valley Water Board issued resolution R5-2006-0061 to control diazinon and chlorpyrifos in the Sacramento-San Joaquin Delta (the Delta Amendment). Both Amendments adopted the new diazinon water quality objectives, calculated using the corrected data set.

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### **Legal Basis for Peer Review**

According to the Health and Safety Code, section 57004(d):

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## Evaluation of Need for Peer Review

**Table 1** provides a list of the scientific elements of the Proposed Amendment and identifies the previous amendments that were used as sources in developing the Proposed Amendment. All of the previous Basin Plan amendments qualify as source documents that have been previously peer reviewed by a recognized expert or body of experts. As such, scientific portions of the Proposed Amendment and aspects of its scientific basis have been through a complete peer review process in accordance with HSC 57004.

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In addition to relying on the previously peer reviewed Basin Plan amendments as source documents, the Proposed Amendment also utilized the same scientific approach. The following is a list of elements of the Proposed Amendment and how the scientific approach is equivalent to the previously peer reviewed Basin Plan amendments.

### 1. Diazinon and chlorpyrifos water quality objectives.

The US EPA methodology for deriving criteria, used in the Original Amendment and also in the San Joaquin River and Delta Amendments, has been applied to the Proposed Amendment. The recommended diazinon and chlorpyrifos water quality objectives for the Proposed Amendment are based on a recalculation of the California Department of Fish and Game's (CDFG) diazinon and chlorpyrifos water quality criteria (Siepmann and Finlayson, 2000). Central Valley Water Board staff followed the US EPA guidance on the derivation of criteria for the protection of aquatic life (USEPA, 1985). The water quality objectives for the Proposed Amendment are identical to the

Delta and San Joaquin River objectives. As with the San Joaquin River and Delta Amendments, the CDFG criteria were recalculated to utilize a revised dataset and to express the criteria to two significant figures, consistent with the USEPA guidance. As with the San Joaquin River and Delta Amendments, the frequency with which the criteria can be exceeded has been changed from the USEPA guidance recommendation of once every three years on the average to once every three-year period to simplify evaluation of compliance.

## 2. Loading capacity

The approach to setting the loading capacity used in the San Joaquin River and Delta Amendments is also proposed for the Sacramento and Feather Rivers. Specifically, the Proposed Amendment sets the loading capacity equal to the existing additive formula, which accounts for the additive effects of chemicals with the same mode of action. The formula sums the ratios of the concentration of each pesticide in the water body to the applicable objective for that pesticide. A sum of greater than one (1) indicates that applicable narrative objectives are not met. The additive formula is applied to both the loading capacity and allocations (i.e. the sum of the ratio of the concentrations). This is the identical approach that was taken with the San Joaquin and Delta Amendments.

## 3. Allocation methodology

Allocations are proposed to be set equal to the loading capacity. This approach is identical to the peer reviewed approach used in the San Joaquin River and Delta Amendments.

## 4. Monitoring

The current Basin Plan as amended by the Original Amendment defines goals for required monitoring to determine whether the water quality objectives and load allocations are being met. The only proposed change in the Proposed Amendment compared to the Original Amendment is the policy decision to explicitly include chlorpyrifos as one of the pesticides to monitor. The recommended approach has been peer reviewed in the Original Amendment and in the San Joaquin and Delta Amendments.

## **Conclusion**

Based on Staff's understanding of HSC 57004 and APM Section 8, III. D., staff has determined that the scientific portions and scientific basis of the Proposed Amendment to control discharges of diazinon and chlorpyrifos into the Sacramento and Feather Rivers are based on source material that has already been peer reviewed. The Proposed Amendment is itself just a new application of earlier, adequately peer reviewed work products. As shown above, it does not depart from the scientific approach of the other Basin Plan Amendments from which it is derived. Therefore, the Proposed Amendment has already satisfied the peer review requirement of HSC 57004 and, therefore, does not require additional peer review.

Should you have any comments or questions about this assessment, please contact either Paul Hann at (916) 464-4628 or phann@waterboards.ca.gov or Joe Karkoski at (916) 464-4668 or jkarkoski@waterboards.ca.gov.

**References:**

- Beaulaurier, D., G. Davis, J. Karkoski, M. McCarthy, D. McClure, M. Menconi. 2005. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Diazinon and Chlorpyrifos Runoff into the Lower San Joaquin River. California Regional Water Quality Control Board, Central Valley Region. Sacramento, CA.
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- McClure, D., G. Davis, J. Karkoski, P. Lee. 2005. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento and San Joaquin Delta. California Regional Water Quality Control Board, Central Valley Region. Sacramento, CA.
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Linda S. Adams  
Secretary for  
Environmental Protection

# State Water Resources Control Board

## Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455  
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100  
Fax (916) 341-5463 • <http://www.waterboards.ca.gov>



Arnold Schwarzenegger  
Governor

**TO:** Ken Landau  
Assistant Executive Officer  
Central Valley Regional Water Board

**FROM:** Gerald W. Bowes, Ph.D., Manager  
Toxicology and Peer Review Section  
Division of Water Quality

**DATE:** November 20, 2006

**SUBJECT:** EVALUATION OF NEED FOR SCIENTIFIC PEER REVIEW OF THE  
PROPOSED SACRAMENTO AND FEATHER RIVERS DIAZINON AND  
CHLORPYRIFOS BASIN PLAN AMENDMENT

This memorandum responds to your November 9, 2006 communication on the subject above. Your staff has concluded that the proposed Basin Plan Amendment does not have to be submitted for external scientific peer review, which normally is a requirement of Health and Safety Code Section 57004 for proposed rules. According to staff, the scientific approach is identical to that employed in two other peer reviewed Basin Plan Amendments adopted in the last two years by your Board for the same two organophosphorous pesticides. These are referred to as the "San Joaquin River Amendment" and the "Delta Amendment."

As noted in your memorandum, one of the circumstances where work products may not be subject to external peer review is when it has been "peer reviewed previously with a known record by a recognized expert or expert body" . . . and "does not depart significantly from its scientific approach." This clarification appears in the peer review guidelines for the State and Regional Water Boards, as you noted. It is based on text that appears in the following document: Unified California Environmental Protection Agency. Policy and Guiding Principles for External Scientific Peer Review. March 13, 1998.

I also talked with your staff. Based on these discussions and the information provided in your letter, I conclude that the proposed Basin Plan Amendment does not have to be submitted for external peer review. The basis for my conclusion follows. If any of this is not accurate, please let me know and we will discuss the matter further.

*California Environmental Protection Agency*

### Water Quality Objectives

1. The "original" 2003 Basin Plan Amendment (for which the proposed amendment is an update) established water quality objectives, TMDLs, and an implementation plan for diazinon in the Sacramento and Feather Rivers. Chlorpyrifos was not included in the original Amendment.
2. Subsequent to adoption of the original Basin Plan Amendment, new information about the dataset that was used to establish criteria (and, subsequently objectives) for diazinon showed that it contained some incorrect information. The corrected criteria were approximately twice the original values, as noted in your letter.
3. In 2005 and 2006, the Central Valley Water Board adopted two additional Basin Plan Amendments that included water quality objectives for diazinon. These are the "San Joaquin River Amendment," and the "Delta Amendment," referred to above. The corrected, higher values for diazinon were used in these amendments. Before adoption, each of the two amendments was submitted for external peer review, following the requirements of Health and Safety Code Section 57004. The rationale for establishing the diazinon objectives based on the higher criteria was reviewed and accepted by the reviewers.
4. The San Joaquin River Amendment and the Delta Amendment also included objectives for chlorpyrifos. The proposed chlorpyrifos objectives were reviewed and accepted by the external reviewers.

### Implementation of Water Quality Objectives

1. Loading Capacity. The approach for determining loading capacity for diazinon and chlorpyrifos for the proposed Sacramento and Feather Rivers Basin Plan Amendment is the same as that used for the San Joaquin River Amendment and the Delta Amendment. This is based on a formula which "sums the ratios of the concentration of each pesticide in the water body to the applicable objective for that pesticide. A sum of greater than one (1) indicates that the applicable narrative objectives are not met."
2. Allocation Methodology. "Allocations are proposed to be set equal to the loading capacity." Again, this methodology is stated to be identical to the one employed in the San Joaquin River and Delta Amendments.
3. Monitoring. The original Amendment did not include chlorpyrifos, but the proposed Amendment includes both diazinon and chlorpyrifos. The monitoring strategy is identical to that in the San Joaquin River and Delta Amendments.

With respect to (1) Loading Capacity, (2) Allocation Methodology, and (3) Monitoring, I assume that the external peer reviewers have concurred with the approaches taken for all the Amendments referred to. However, as you are aware, Health and Safety Code

Section 57004 allows flexibility in responding to a reviewer's comment which may be critical of a certain part of the proposed rule's scientific basis. The organization requesting review of its proposed rule may change the proposal to conform to a reviewer's recommendation, or it may choose not to. In the latter circumstance, the organization requesting peer review must demonstrate why its approach is based on sound scientific principles. If the latter course of action was taken for any scientific component in the San Joaquin River Amendment and the Delta Amendment, or for the proposed Amendment, Health and Safety Code Section 57004 states the following: [the Cal/EPA organization] "shall explain, and include as part of the rulemaking record, its basis for arriving at such a determination in the adoption of the final rule, including the reasons why it has determined that the scientific portions of the proposed rule are based on sound scientific knowledge, methods, and practices." This determination and supporting rationale also would have to be brought to the attention of the Board at the time the proposed Amendment is adopted. In adopting the proposed Amendment, the Board would be concurring with staff's rationale.

The proposed Amendment does not appear to contain any new scientific components compared to the San Joaquin River and Delta Amendments.

If you have any questions concerning the above, please contact me at (916) 341-5567 ([gbowes@waterboards.ca.gov](mailto:gbowes@waterboards.ca.gov)).

cc: Frances McChesney, OCC