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EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Central Valley Regional Water Quality Control Board

TO: Gerald Bowes, Ph.D.
Manager, Cal/EPA Scientific Peer Review Program
Office of Research, Planning and Performance
State Water Resources Control Board
Post Office Box 100
Sacramento, CA 95812-0100

FROM: Adam Laputz
Assistant Executive Officer
CENTRAL VALLEY WATER BOARD

DATE: 26 May 2015

SUBJECT: REQUEST FOR EXTERNAL PEER REVIEW OF THE SCIENTIFIC BASIS OF THE PROPOSED BASIN PLAN AMENDMENT TO ESTABLISH CONTROL OF PYRETHROID PESTICIDES DISCHARGES IN THE SACRAMENTO AND SAN JOAQUIN RIVER BASINS

Staff of the Central Valley Regional Water Quality Control Board (Central Valley Water Board) requests that you initiate the process to identify external scientific peer reviewers for the proposed Basin Plan Amendment related to the control of pyrethroid pesticides discharges in the Sacramento River and San Joaquin River basin per the requirements of Health and Safety Code Section 57004. The scientific basis for the proposed Basin Plan Amendment is contained in the *Draft Staff Report, Including Substitute Environmental Documentation for the Control of Pyrethroid Pesticides Discharges* (Draft Staff Report), which is the primary scientific document submitted for review. Additions to the request for external peer review between the draft version sent out earlier and this final version are highlighted in red text.

The proposed Basin Plan Amendment will affect the entire Sacramento River and San Joaquin River Basin, and it consists of the following three elements:

1. Acute and chronic additive numeric water quality objectives including six pyrethroid pesticides: bifenthrin, cyfluthrin, cypermethrin, esfenvalerate, lambda-cyhalothrin, and permethrin.
2. Total maximum daily loads (TMDLs) and other pollution controls for discharges to water bodies that are impaired by pyrethroids (as identified on the Clean Water Act section 303(d) list).

3. A program of implementation, including required actions and monitoring and surveillance requirements for agricultural, storm water, and wastewater dischargers, in order to achieve the water quality objectives and TMDLs.

Expected Date of Regional Board Hearing
Staff is expected to present to the Central Valley Water Board the Draft Staff Report and proposed Basin Plan Amendment in February 2016, with a proposed adoption by the Central Valley Water Board in April 2016. In order to meet this schedule, we request receipt of the scientific peer reviewer's comments no later than 26 June 2015.

Expected Date the Documents will be Available for Review
May 27, 2015

Requested Review Period
We request that scientific peer review be accomplished within the normal review period of thirty (30) days.

Length of Documents and References
The primary document (Draft Staff Report) is approximately 300 pages, including appendices. There are six secondary documents that are approximately 50 pages each, not including appendices. These are the six individual pyrethroid pesticide water quality criteria reports. The seventh and eighth secondary documents are the pesticide criteria derivation methodology, which is divided into a Phase I report and a Phase II report. The Phase I report is 100 pages and the Phase II report is approximately 140 pages, not including appendices. References cited in the primary document and secondary documents will be provided to reviewers upon request.

Suggested Areas of Expertise for Reviewers
The Draft Staff Report (primary scientific document) is comprehensive and encompasses numerous disciplines. We suggest that several reviewers with varying expertise are appropriate for this project. Scientific peer reviewers should have expertise in the following fields:

- **Aquatic toxicology** – Expertise in ecotoxicology, particularly pollutant effects on aquatic invertebrates and fish, aquatic toxicology of pesticides, toxicity test methods, statistical analysis of ecotoxicology data.
  This expertise is needed for conclusions 1, 2, 3, and 5 regarding the Pyrethroid Pesticides Water Quality Objectives, Water Quality Criteria Derivation Methodology, Additivity of Pyrethroid Pesticides, and TMDLs.
- **Bioavailability** – Expertise in environmental chemistry and/or ecotoxicology, particularly on phase partitioning behavior of nonionic hydrophobic chemicals in surface waters, bioavailability measurement methods, application of bioavailability in risk assessment and monitoring.
  This expertise is needed for conclusion 4, Bioavailability and Compliance Determination.

Contact Information

Tessa Fojut is the project manager: Tessa.Fojut@waterboards.ca.gov (916) 464-4691.
If Tessa is not available, please contact Daniel McClure:
Daniel.McClure@waterboards.ca.gov (916) 464-4751.

Attached please find (1) a plain English summary of the Draft Staff Report, (2) a list of the specific scientific findings and conclusions that we would like the reviewers to address, and (3) a list of the persons who have participated in the development of the draft document.

cc: Mr. Rik Rasmussen, Division of Water
Quality, State Water Resources
Control Board, Sacramento

Attachment 1

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS TO ESTABLISH CONTROL OF PYRETHROID PESTICIDES DISCHARGES

Plain English Summary of Proposed Action

Introduction to the *Draft Staff Report, Including Substitute Environmental Documentation for the Control of Pyrethroid Pesticides Discharges* (Draft Staff Report)

To address water bodies that are impaired by pyrethroid pesticides and to preserve and enhance the quality of California's water resources in the Sacramento River and San Joaquin River basin, Central Valley Water Board staff has developed a Draft Staff Report and Draft Basin Plan Amendment. The Draft Basin Plan Amendment (Appendix A in the Draft Staff Report) is the proposed action that will become regulation if adopted by the Central Valley Water Board. The Draft Staff Report provides the supporting documentation and scientific basis for the Draft Basin Plan Amendment, including evaluation of alternatives for water quality objectives.

Summary of the Basin Plan Amendment

The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) covers the entire Sacramento River and San Joaquin River basins; this is the geographic scope or "proposed Project Area" of the proposed action. Pyrethroid pesticides are used to control a broad array of agricultural invertebrate pests as well as ants, termites, and other pests in urban areas. Monitoring in the Sacramento River and San Joaquin River basins has documented toxicity caused by pyrethroid residues in sediments to the aquatic invertebrate *Hyalella azteca*. Monitoring has also documented concentrations of pyrethroids in the water column that are potentially harmful to aquatic life. Six pyrethroid pesticides were identified as causing or contributing to these exceedances in sediment and/or the water column: bifenthrin, cyfluthrin, lambda-cyhalothrin, cypermethrin, esfenvalerate, and permethrin.

There are fifteen water quality impairments attributed to pyrethroids on the Clean Water Act section 303(d) List (the "303(d) List") based on sediment toxicity and exceedances of aqueous levels of concern for pyrethroids in the Central Valley. Nine of these impairments are in urban water bodies with urban storm water as the source of pyrethroid pesticides. The remaining six impairments are in agricultural water bodies with agricultural runoff as the source of impairments. The Central Valley Water Board is required to establish TMDLs or other pollution controls for water body-pollutant combinations on the 303(d) List, pursuant to section 303(d) of the federal Clean Water Act. The Porter-Cologne Water Quality Control Act and the Clean Water Act require numeric water quality objectives to be established for the reasonable protection of beneficial uses, including aquatic life. (Wat. Code, § 13050(h).) Therefore, Central Valley Water Board staff developed a Draft Basin Plan Amendment to establish: 1)

water quality objectives that include the six identified pyrethroid pesticides; 2) TMDLs and other pollution controls to address impaired waters; and 3) a program of implementation to achieve the water quality objectives and TMDLs.

The major actions proposed in the Draft Basin Plan Amendment are listed below.

The Draft Basin Plan Amendment:

- Would establish acute and chronic additive water quality objectives for six pyrethroid pesticides that have been identified as causing water quality impairments. The water quality objectives would apply in Sacramento River and San Joaquin River basin water bodies with warm freshwater habitat or cold freshwater habitat (WARM/COLD) beneficial uses. These beneficial uses are intended to preserve or enhance aquatic habitats, vegetation, fish or wildlife, including invertebrates.
- Would establish total maximum daily loads (TMDLs) for pyrethroids for urban storm water dischargers who discharge to water bodies that are listed as impaired by pyrethroid pesticides from urban runoff (as identified on the Clean Water Act section 303(d) list). The wasteload allocations for these dischargers would be concentration-based and equivalent to the water quality objectives, as well as based on sediment toxicity testing.
- Would establish specific pollution controls for pyrethroids for agricultural dischargers who discharge to water bodies that are listed as impaired by pyrethroid pesticides from agricultural runoff (as identified on the Clean Water Act section 303(d) list). These specific pollution controls would be implemented through the existing Irrigated Lands Regulatory Program and would result in attainment of the proposed pyrethroids water quality objectives.
- Would describe actions that the Water Boards and other agencies should take to support the attainment of the pyrethroid pesticides water quality objectives and TMDLs.
- Would establish implementation programs for pyrethroid pesticides by discharger type (municipal storm water, municipal and domestic wastewater, and agricultural). The implementation programs require discharger actions when a water body is not attaining an objective or if they have TMDL allocations.
- Would establish monitoring and surveillance goals for each discharger type (municipal storm water, municipal and domestic wastewater, and agricultural) to evaluate whether the pyrethroid pesticides water quality objectives and/or TMDL allocations are being attained.
- Proposes an adaptive management strategy that allows for the review of the water quality objectives, TMDL allocations, and implementation program in 8 years.
- Proposes a timeline for attaining the water quality objectives and TMDL allocations.

Primary Document - Draft Staff Report (300 pages)

The Draft Staff Report describes the rationale and support for the technical elements of the Draft Basin Plan Amendment. The technical topics of the Draft Staff Report are water quality objectives and protection of beneficial uses, TMDLs, and additivity and bioavailability of pyrethroid pesticides. More description of the key technical topics for review in the Draft Staff Report is given in Attachment 2.

Secondary Documents - UC-Davis Methodology (240 pages)
The Central Valley Regional Water Board contracted with the University of California Davis to develop a methodology to derive water quality criteria for the protection of aquatic life for pesticides. The methodology was developed in two phases. Phase I was a review of available methods worldwide (100 pages). The rationale for the development of the UC-Davis methodology and the methodology itself are contained in the Phase II report (140 pages). The UC-Davis method was used to derive the six pyrethroid pesticide water quality criteria that are used in the proposed acute and chronic additive water quality objectives in the Draft Basin Plan Amendment.

Secondary Documents – Water Quality Criteria Reports (6 documents, ~50 pages each)
The Central Valley Regional Water Board contracted with the University of California Davis to apply the UC-Davis method to derive water quality criteria for six individual pyrethroid pesticides. These criteria reports were subsequently updated by Regional Water Board staff to include recent toxicity data. Each criteria report includes the data set used in criteria calculation, the calculations of acute and chronic criteria, and any other considerations in determining the final criteria for each pyrethroid pesticide.

Attachment 2

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS TO ESTABLISH CONTROL OF PYRETHROID PESTICIDES DISCHARGES

Description of Scientific Basis for the Proposed Amendment to be Addressed by Peer Reviewers

The statutory mandate for external scientific review (Health and Safety Code Section 57004) states that it is the reviewer's responsibility to determine whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices. The proposed rule is the Draft Basin Plan Amendment (Appendix A in the Draft Staff Report). The Draft Basin Plan Amendment, if adopted by the Regional Board, would become regulation.

We request that the scientific peer reviewers make this determination for each of the identified assumptions, findings, and conclusions that constitute the scientific portions of the Draft Basin Plan Amendment and that is listed below. An explanatory statement is provided for each assumption, finding, and conclusion.

Pyrethroid Pesticides Water Quality Objectives

1. The proposed water quality objectives are protective of the beneficial use(s) that is most sensitive to pyrethroid pesticides.

The Draft Staff Report evaluates several potential water quality objectives and concludes that the acute and chronic water quality criteria derived in 2015 using the University of California – Davis methodology, are scientifically sound and are protective of beneficial uses. Staff proposes to use the updated criteria derived in 2015 using the UC-Davis methodology because additional high quality data was incorporated into the criteria development that was not available when pyrethroids criteria were originally derived in 2010 and 2011. The University of California – Davis water quality criteria method and individual criteria derived in 2010 and 2011 were reviewed by experts, as well as the public, as part of the development process. The 2010/2011 UC-Davis Criteria Reports for five pyrethroids, comments received, and responses to comments are available at:
http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/criteria_method/index.shtml.

The review should focus on Section 5 (Water Quality Objectives) of the Draft Staff Report and secondary documents (six Water Quality Criteria Reports).

Pyrethroid Pesticides Water Quality Criteria Derivation Methodology

2. The underlying method for deriving the proposed pyrethroid pesticides water quality criteria, which are proposed as water quality objectives and TMDLs, is scientifically sound.

The proposed water quality objectives and TMDLs rely on the UC-Davis Methodology and the Water Quality Criteria Reports for the numeric values of the water quality objectives and TMDLs. Staff concludes that the UC-Davis Methodology and the criteria derived by this method are technically valid and scientifically sound for use as water quality objectives and TMDLs. The following procedures result in conservative criteria that are scientifically sound and protective of sensitive species, and are not overly conservative.

A. The UC-Davis Methodology uses 24-96-hour toxicity data to derive acute criteria not to be exceeded over a 1-hour averaging period and longer duration chronic toxicity data to derive chronic criteria not to be exceeded over a 4-day averaging period. In addition, the most sensitive life-stage and endpoint are used among toxicity data for a given species. These are the same definitions of acute and chronic toxicity data and criteria averaging periods used in the 1985 USEPA criteria derivation guidelines and are also based on an additional literature review in the Phase II Report demonstrating that some pesticides, particularly pyrethroids, can demonstrate toxic effects after 1-hour exposures. The use of toxicity data from longer durations than the criteria averaging period does provide conservatism to the criteria; based on scientific evidence this is valid in order to ensure that the values are protective of all species in an aquatic ecosystem, including those for which no toxicity data is available.

B. Most criteria derivation methods reviewed in the Phase I Report recommend the 5th percentile of the species sensitivity distribution for calculation of criteria. The UC-Davis Methodology recommends using the 5th percentile, but if criteria based on the 5th percentile of the SSD do not appear to be protective of sensitive species in the data set (and that toxicity value is based on a measured concentration), then the criteria may be adjusted downward. The authors recommend using the lower 95% confidence interval of the 5th percentile or the 1st percentile of the SSD for downward adjustment of criteria. Five of the six 2015 water quality criteria derived using the UC-Davis Methodology were adjusted downward using the 1st percentile of the SSD to be protective of sensitive species in the data sets, however, using the 5th percentile would be more consistent with other methodologies.

C. Like most criteria derivation methodologies reviewed in the Phase I Report, data based on measured and nominal concentrations are both used for criteria derivation, although measured data is preferred when it is available. Similarly, data from flow-through, static renewal, and static tests are all used together in criteria derivation, although flow-through data is preferred when it is available. It

is scientifically sound to mix flow-through, static renewal, and static data in deriving criteria and does not introduce bias that would lead to criteria that are underprotective or overly conservative. While data from flow-through tests based on measured concentrations is preferred, using the best available data for a given species is technically valid.

D. When there are insufficient acute toxicity data to use a species sensitivity distribution to derive the acute criterion, the UC Davis methodology Phase II Report includes assessment factors that are applied to the lowest acute toxicity value in the data set in order to estimate the 5th percentile of a distribution. The assessment factors decrease as the number of available data increase because uncertainty decreases with increasing information. The assessment factors were derived by a mathematical procedure from the USEPA guidance for the Great Lakes system using existing high quality pesticide data sets. It is recognized that assessment factors are a conservative approach for deriving water quality criteria, but when little data is available, it is scientifically sound to use a conservative approach. Similarly, the UC Davis methodology Phase II Report provides a default acute-to-chronic ratio to use for derivation of chronic criteria when too few chronic toxicity data are available to derive criteria using a species sensitivity distribution or empirical acute-to-chronic ratios for the pesticide of interest. The default acute-to-chronic ratio is based on the 80th percentile of available empirical acute-to-chronic ratios for other pesticides, following the USEPA guidance for the Great Lakes system. Use of the 80th percentile provides some conservatism to the default acute-to-chronic ratio, which is scientifically sound to account for the uncertainty in using this value for pesticides for which little to no chronic toxicity data are available.

The review should focus on the secondary documents (UC-Davis Methodology Phase I and Phase II Reports and six Water Quality Criteria Reports).

Additive Toxicity of Pyrethroid Pesticides

3. For determining attainment of water quality objectives it is scientifically sound to consider the six pyrethroid pesticides additively if more than one is detected in a water sample. Based on current information available, it is not scientifically sound to assume additive toxicity of other constituents with pyrethroid pesticides.

The proposed acute and chronic water quality objectives are written as additivity formulas including the six pyrethroids. If the proposed additive objectives were adopted, then when more than one pyrethroid is detected in a water sample, an exceedance of the objective would be determined by considering the sum of all detected pyrethroids relative to their respective water quality criteria reference value. The proposed additive water quality objectives are based on the conclusion that pyrethroid pesticides have approximately additive toxicity to aquatic organisms. A review of the literature led staff to conclude that it is scientifically sound to assume that the effects of multiple pyrethroids on aquatic organisms are additive. Staff also concluded that based on the current state of science, it is not scientifically sound to assume that the effects of

pyrethroids and other constituents (e.g., metals, other classes of pesticides, industrial chemicals, etc.) are additive.

The review should focus on Section 5.2 (Additive Toxicity) of the Draft Staff Report and secondary documents (six Water Quality Criteria Reports).

Bioavailability and Compliance Determination

4. For determining attainment of water quality objectives, it is scientifically sound to use the measured or estimated freely dissolved aqueous concentrations of pyrethroid pesticides. The proposed equation to estimate freely dissolved concentrations and the default partition coefficients are scientifically sound and protective of beneficial uses.

Based on a literature review, staff concluded that pyrethroid pesticides detected in whole water samples are likely not entirely bioavailable to aquatic organisms because the fraction adsorbed to particulates or dissolved organic matter are much less bioavailable or are not bioavailable to aquatic organisms. Staff concluded that it is scientifically sound to use the freely dissolved aqueous pyrethroid concentrations for determining attainment of the proposed water quality objectives. Freely dissolved concentrations may be estimated using partition coefficients or analytical techniques may be available in the near future for directly measuring the freely dissolved concentration. Staff proposed an equation for estimating freely dissolved concentrations using partition coefficients and default partition coefficients that may be used in the absence of site-specific partition coefficients. To calculate the default partition coefficients, staff relied on data from batch equilibrium experiments using natural sediments and similar solids-to-solution ratios and in which the freely dissolved concentration of pyrethroids were directly measured.

The review should focus on Section 5.3 (Bioavailability) of the Draft Staff Report and secondary documents (six Water Quality Criteria Reports).

Pyrethroid Pesticides TMDLs

5. The proposed TMDL loading capacity, allocations, margin of safety, and numeric targets are clearly described and consistent with attaining water quality objectives that are protective of the beneficial use(s) most sensitive to pyrethroid pesticides.

The Draft Staff Report evaluates alternatives for establishing a loading capacity and allocations and concludes that establishing concentration-based allocations consistent with the proposed water quality objectives would be achievable and protective of beneficial uses. Staff concludes that because an implicit margin of safety is built in to the UC-Davis criteria derivation methodology, no explicit margin of safety is required for the allocations. Similarly, because the allocations and loading capacity are defined on a concentration basis (rather than mass-per-time), seasonal variation and critical conditions are considered in the proposed TMDLs because measuring concentration

will account for varied flows and conditions, and the UC-Davis criteria are designed to be protective of sensitive species and threatened and endangered species at all life-stages. The proposed numeric targets are consistent with the proposed additive water quality objectives and also include sediment toxicity testing in order to ensure that pyrethroid residues in bed sediments are not causing toxicity.

The review should focus on Section 6 (Addressing Impaired Waters) of the Draft Staff Report and secondary documents (six Water Quality Criteria Reports).

The Big Picture

Reviewers are not limited to addressing only the specific topics presented above. Additionally, we invite you to contemplate the following "Big Picture" questions.

(a) In reading the Draft Staff Report and Draft Basin Plan Amendment language, are there any additional scientific issues that should be part of the scientific portion of the proposed rule that are not described above? If so, comment with respect to the Draft Staff Report and Draft Basin Plan Amendment.

(b) Taken as a whole, is the scientific portion of the proposed actions based upon sound scientific knowledge, methods, and practices?

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirements for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

The preceding guidance will ensure that reviewers have the opportunity to comment on all aspects of the scientific basis of the proposed Central Valley Water Board actions. At the same time, reviewers also should recognize that the Central Valley Water Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, reviewers are encouraged to focus feedback only on the scientific issues that are relevant to the Draft Staff Report and Draft Basin Plan Amendment being proposed.

Attachment 3

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS TO ESTABLISH CONTROL OF PYRETHROID PESTICIDES DISCHARGES

Individuals Involved in Development of this Basin Plan Amendment

UC-Davis Water Quality Criteria Derivation Methodology

- Patti TenBrook, Ph.D., U.S. Environmental Protection Agency
- Amanda Palumbo, Ph.D., State Water Resources Control Board
- Tessa Fojut, Ph.D., Central Valley Regional Water Quality Control Board
- Ron Tjeerdema, Ph.D., University of California - Davis
- Joe Karkoski, Central Valley Regional Water Quality Control Board
- Danny McClure, Central Valley Regional Water Quality Control Board
- Paul Hann, State Water Resources Control Board

Scientific Reviewers of the UC-Davis method

- Larry Curtis, Ph.D., Oregon State University
- Evan Gallagher, Ph.D., University of Washington
- John Knezovich, Ph.D., Lawrence Livermore National Laboratory and University of California Davis
- Marshall Lee, California Department of Pesticide Regulation

Public Commenters on the UC-Davis method

- Roberta Firoved, California Rice Commission
- Dee Ann Staats, Croplife America
- Warren Tellefson, Central Valley Clean Water Agency
- Nick Poletika, Dow AgroSciences
- William Thomas, Dow AgroSciences
- William Warren-Hicks, EcoStat
- Stephen Clark, Pacific EcoRisk
- Allen Short, San Joaquin Tributary Association
- Wendell Kido, Sacramento Regional County Sanitation District
- Lenwood Hall, University of Maryland
- Debra Denton, U.S. Environmental Protection Agency
- Joe Beaman, U.S. Environmental Protection Agency
- Nasser Dean, Western Plant Health Association
- Renee Pinel, Western Plant Health Association

UC-Davis Water Quality Criteria Reports

- Patti TenBrook, Ph.D., U.S. Environmental Protection Agency
- Amanda Palumbo, Ph.D., State Water Resources Control Board
- Tessa Fojut, Ph.D., Central Valley Regional Water Quality Control Board

- Ron Tjeerdema, Ph.D., University of California – Davis
- Isabel Faria, Ph.D., University of California – Davis
- Caitlin Rering, University of California – Davis
- Rebecca Mulligan, University of California – Davis
- Sandra Chang, University of California – Davis
- Susanne Brander, Ph.D., University of North Carolina Wilmington
- Kelly Trunnelle, Ph.D., University of California – Davis
- Danny McClure, Central Valley Regional Water Quality Control Board
- Josh Grover, California Department of Fish and Wildlife

Scientific Reviewers of the UC-Davis criteria reports

- Evan Gallagher, Ph.D., University of Washington
- John Knezovich, Ph.D., Lawrence Livermore National Laboratory and University of California Davis
- Xin Deng, Ph.D., California Department of Pesticide Regulation
- Stella McMillan, California Department of Fish and Wildlife

Public Commenters on the UC-Davis criteria reports

- Lenwood Hall, University of Maryland
- Nasser Dean, Western Plant Health Association
- Aldos Barefoot, DuPont Crop Protection
- Stephen Clark, Pacific EcoRisk
- Scott Ogle, Pacific EcoRisk
- Paul Whatling, Cheminova, Inc.
- Kelye McKinney, City of Roseville
- Michael Bryan, Robertson-Bryan Inc.
- Brant Jorgenson, Robertson-Bryan Inc.
- Ben Guidice, Robertson-Bryan Inc.
- Jeffrey M. Giddings, Compliance Services International
- Kevin S. Henry, Syngenta Crop Protection, Inc.
- Sherrill Huun, Sacramento Stormwater Quality Partnership
- Dan Gwaltney, Sacramento Stormwater Quality Partnership
- Linda Dorn, Sacramento Regional County Sanitation District
- Debbie Webster, Central Valley Clean Water Association
- Jason Loft, Sacramento Regional County Sanitation District
- Karen Cain, Bayer Crop Science
- Henry Buckwalter, Western Plant Health Association
- Jeffrey Wirtz, Compliance Services International
- Christopher Davis, FMC Corporation