From: Michael Lozeau [michael@lozeaudrury.com]
Sent: Monday, September 27, 2010 4:11 PM
To: ILRP Comments; Pamela Creedon; Adam Laputz
Cc: Joe Karkoski; Bill Jennings; Richard Drury
Subject: CSPA Comments on ILRP PEIR and Related Documents - E-mail 1 of 2
Attachments: 2010.9.27 CSPA ILRP Comments Final.pdf; ECONWComments092710 CSPA Exhibit A.pdf; SWAPE comments 9_27 CSPA Exhibit B.pdf; S. Bond letter ilrp CSPA Exhibit C.pdf; MacMullan 100427.pdf; Buckley 100730.pdf; Niemi 100730.pdf; mhagemann 9_27 CV.pdf

Dear Ms. Smith, Ms. Creedon and Mr. Laputz,

Attached please find the comments of California Sportfishing Protection Alliance and California Water Impact Network on the draft environmental impact report for the Irrigated Lands Regulatory Program and related documents. Also attached are several comments prepared by three expert consultants and their accompanying resumes. In separate e-mails, I will forward additional documents cited in the main comment letter that CSPA and CWIN request the Regional Board include in the administrative record. If you could please confirm receipt of the attached comments and the additional documents would be appreciated. If you have any questions, please do not hesitate to call. Thank you for considering our comments.

Sincerely,

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September 27, 2010

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Re: California Sportfishing Protection Alliance Comments on Draft Irrigated Lands Regulatory Program - Program Environmental Impact Report

Dear Ms. Smith, Ms. Creedon and Mr. Laputz,

On behalf of the California Sportfishing Protection Alliance and California Water Impact Network (collectively "CSPA"), thank you for this opportunity to provide comments on the "Draft Program Environmental Impact Report for the Long-term Irrigated Lands Regulatory Program ("ILRP") within the Central Valley Region" (July 28, 2010) ("PEIR") and the accompanying "Irrigated Lands Regulatory Program Long-Term Program Development Staff Report (July 2010) ("Staff Report") and the "Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program" (July 2010) ("Technical Memo") prepared by ICF International. On 26 May, 2006, CSPA previously submitted comments on the Draft Central Valley Existing Conditions Report released in February 2006 and finalized in December 2008 and on 30 May, 2008 CSPA submitted scoping comments on the Long-term Irrigated Lands Regulatory Program and Associated Programmatic Environmental Impact Report, which are hereby incorporated by reference.

We have prepared these comments with the assistance of EcoNorthwest, SWAPE (Soil/Water/Air Protection Enterprise) and Steven Bond & Associates, Inc. ECONorthwest has reviewed and prepared a critique of the Technical Memo prepared

by ICF International. *See* ECONorthwest, "An Economic Review of the Draft Irrigated Lands Regulatory Program Environmental Impact Report" ("ECONorthwest Review") (Sept. 27, 2010). SWAPE and Steven Bond & Associates have reviewed and prepared comments regarding the proposed monitoring and management practice implementation. Their comments are attached hereto as Exhibits A through C and are incorporated herein in their entirety. The experts' comments require separate responses in the Final EIR.

I. INTRODUCTION.

As the Staff Report acknowledges, "a regulatory program that is lax or allows too much time for compliance can lead to an exacerbation of water quality problems and prolonged impacts on beneficial uses." Staff Report, p. 2. This is in fact the result of the first seven years of the current ILRP. Impacts have been prolonged while staff spends all of its time wrangling with informal coalitions over which the Regional Board has no enforcement authority and which have cornered a vast majority of the fees thus far provided for the ILRP from the regulated dischargers. No improving trend in water quality impacts has been reported. Instead, for seven years, the coalitions have managed to steer the program to focus exclusively regional monitoring while avoiding farm-specific monitoring or information collection. The regional monitoring has further documented the extensive pollution already apparent in November 2000 when CSPA first petitioned the Regional Board to terminate the obsolete and water quality-damaging agricultural waiver from 1982.

Since the inception of the ILRP in 2003, staff and the Regional Board have been reticent in mandating that best practicable controls and technology ("BPTC") be installed and implemented by individual farms, reported to the Board and monitored for their effectiveness. Since 2003, CSPA and numerous experts have stated the obvious – any program that refuses to require dischargers to implement BPTC and confirm its effectiveness is bound to fail or at least delay for a very long time compliance with the Central Valley's water quality standards and antidegradation requirement.

CSPA has now stood by for seven years and observed each of its concerns coming true. After seven years, the Regional Board does not have any idea whether any farms have implemented any specific management measures. Assuming some measures are in place, the Board does not know whether they are working to reduce pollution, comply with applicable water quality standards or qualify as BPTC. And the current program's exclusive reliance on regional monitoring will never inform the Regional Board about the presence or effectiveness of management measures miles upstream.

The various coalitions have produced watershed management plans but, invariably, each of those plans fizzles in its follow-up to enforce implementation of management measures by specific farms. The plans indicate the coalitions will coordinate various meetings with a subset of farms and perhaps do some follow-up visits on site. However, because the coalitions exist in some extra-legal realm, none of their members need to do anything they say. The Board may or may not know about

which farms failed to implement any effective management measures. And it is virtually certain that the Regional Board, having based its entire program on coalitions, would not likely eliminate a coalition for an entire section of the Central Valley.

According to staff, after seven years, the Board is preparing to proceed with a single enforcement action including proposed civil penalties for one recalcitrant discharger. It is CSPA's understanding that enforcement action apparently is based on a tip from a water district and the violations could not have been discovered by the Regional Board based on the information required under the existing coalition-based program.

Now, staff is proposing to build on this record of lack of progress by proposing more of the same. It is clear from the PEIR, the bias evident in the accompanying economic analysis and staff's interpretations of the objectives identified by the coalition-dominated stakeholder group to promote the status quo, that staff is not focused on a program that achieves water quality objectives and protects beneficial uses consistent with the Regional Board's primary mission. Instead, staff is focused on proposing a program that is acceptable to the irrigated lands dischargers. The current program and staff's proposal unfortunately give real meaning to the phrase, "letting the fox guard the hen house." If the Regional Board chooses an ILRP alternative that does not have all individual farms reporting to the Regional Board on their specific management measures, *i.e.*, a farm water quality management plan ("FWQMP"), the Regional Board will not know in a timely manner or perhaps at all what any specific farm is planning on implementing. If the ILRP does not require individual farms to report on what measures they in fact implemented or installed, then the Regional Board will not know in a timely manner or perhaps at all what BMPs have been implemented throughout the Central Valley. And if the Regional Board does not require dischargers to gather water quality data that evaluates the performance of installed management measures, the Regional Board will never know what if any pollution reductions have resulted and whether the measures achieve the BPTC standard.

CSPA's frustration is exacerbated by staff's decision to circulate an environmental impact report that snubs its nose at CEQA's requirements and fails to provide the Regional Board the basic comparative tool to assist it in devising an ILRP that will work to protect water quality while balancing – not pandering – to the possible costs that the agricultural dischargers may have to bear for their pollution. CSPA, however, is not interested in simply critiquing every step that staff takes. CSPA, with the help of its consultants and almost a decade of constructive engagement on the irrigated lands pollution problem, has prepared its own alternative that balances the needs for firm regulatory action while allowing prioritization based on already measured regional pollution problems and basic monitoring needs to balance and alleviate some of the potential costs. We appreciate the Board's and staff's consideration of the following comments and proposals.

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II. CSPA'S PROPOSED (EFFECTIVE, PROTECTIVE AND LEGALLY ADEQUATE) IRRIGATED LANDS REGULATORY PROGRAM.

As is described below in CSPA's comments on the PEIR, the PEIR's proposed alternatives do not evaluate or provide the Regional Board a reasonable range of alternatives to the current ILRP. The following alternative should be included in the PEIR's evaluation. This alternative could be appropriately labeled "Direct Oversight and Prioritized Farm Monitoring," and on the spectrum of alternatives presented in the PEIR falls somewhere between Alternatives 3 and 4 and Alternative 5, depending on the specific component that is being addressed.

1. Individual Growers Covered Not Third Parties: Individual growers would apply for coverage. No third-party applications would be authorized. CSPA generally agrees with the application information outlined in the PEIR. *See* PEIR, p. 3-15.

2. Farm Water Quality Management Plans (FWQMPs): Under this alternative, growers would be required to develop and implement individual FWQMPs in order to minimize discharge of waste to groundwater and surface water from irrigated agricultural lands. FWQMPs for surface water should be completed within 6 months of issuance of the WDR/conditional waiver and submitted to the Board. The groundwater component could be phased to be completed not later than one year from the WDR/conditional waiver issuance date. The contents of the FWQMPs would be consistent with the contents described in the PEIR. PEIR, p. 3-15. Even though each farm would have its own plan, neighboring farms could still agree on joint practices that address multiple farms. As described in PEIR, "[m]anagement practices could be instituted on an individual basis or could be installed to serve a group of growers discharging to a single location." PEIR, p. 3-16. As the State Board's Policy For Implementation And Enforcement of The Nonpoint Source Pollution Control Program (May 20, 2004) ("NPS Policy") states, "[a] first step in the education process offered by these programs often consists of discharger assessment of their lands or operations to determine NPS problems, followed by development of a plan to correct those problems." NPS Policy, p. 11 (emphasis added). The Board already has ignored this first step for the last 7 years. In regard to agriculture, the NPS Policy effectively requires a FWQMP: "MPs must be tailored to a specific site and circumstances, and justification for the use of a particular category or type of MP must show that the MP has been successfully used in comparable circumstances. If an MP has not previously been used, documentation to substantiate its efficacy must be provided by the discharger." NPS Policy, p. 12 (emphasis added).

3. Tiered Approach: This alternative would regulate the discharge of waste to surface water and groundwater using a tiered approach. Fields would be placed in one of three tiers based on their threat to water quality. The tiers represent fields with minimal (Tier 1), low (Tier 2), and high (Tier 3) potential threat to water quality, along the lines proposed in the PEIR for Alternative 4. PEIR, pp. 3-17 – 3-18. The tiers would be used to adjust the monitoring requirements, assist the dischargers in determining the level of management measures necessary to meet BPTC, and assist the Regional Board in prioritizing enforcement inspections.

4. Non-Water Quality Monitoring: As proposed in the PEIR's Alternative 4, all growers would conduct nutrient tracking, pesticide tracking and implemented tracking of management practices. Again, this information is necessary for a discharger or the Regional Board to evaluate the rationale of a discharger's FWQMP. As the NPS Policy emphasizes, "[i]t is important to recognize that development of a plan is only the first step in developing an implementation program that addresses a discharger's NPS pollution discharges. Implementation of the plan, including any necessary iterative steps to adjust and improve the plan and/or implementation must follow the planning stage." NPS Policy, p. 11.

5. Surface Effluent Quality Monitoring: Within areas where Coalitions are currently required to prepare and implement a management plan, all Tier 2 and 3 farms within that management area that are discharging any pollutant which triggered the management plan, must prepare and implement a discharge monitoring plan for the pollutants governed by the management plan as well as basic parameters that serve as indicators of pollution discharges. The basic parameters would include, for example, flow, toxicity, total nitrogen, nitrate-nitrite, total ammonia, total phosphorous, soluble ortho-phosphate, temperature, turbidity, pH, electrical conductivity, coliform if livestock is present and any applied pesticides and metals. If no toxicity is identified in the initial year, toxicity testing could be dropped for several years. The monitoring plan would include monitoring of effluent discharges at a point downgradient of implementation of BMPs. Where possible, monitoring of influent to any BMP also must be included. CSPA agrees with the proposed number of samples per season outlined in the PEIR. PEIR, p. 3-24. However, like Tier 3, sampling by Tier 2 growers should be every year. Only by direct monitoring of site-specific BMPs can the Regional Board comply with the NPS Policy, where it states that "if the program relies upon dischargers' use of MPs, there should be a strong correlation between the specific MPs implemented and the relevant water quality requirements." NPS Policy, p. 11. Likewise, effluent data of BMP effectiveness within areas known already to be degraded is necessary to implement the state

antidegradation requirement, Resolution No. 68-16, in particular its BPTC requirement as well as its nondegradation provision.

6. Groundwater Monitoring: Growers who qualify as Tier 2 or Tier 3 for groundwater pollution should be required to conduct individual monitoring annually as described for the Tier 3 groundwater growers in the PEIR. PEIR, p. 3-25. All farms should do one season of sampling any existing wells on their property to determine their tier level. All farms also should be required to evaluate any existing public water supply data regarding the presence of pesticides or other pollutants in nearby groundwater. Any regional monitoring should be conducted by the Regional Board or its consultants or other qualified governmental research entities and paid for by a portion of the permit fees collected annually from the dischargers.

7. No Agency "Approval" of Plans: Although staff should review FWQMP or monitoring plans in general, this alternative would not require the Regional Board to approve either an FWQMP or monitoring plan. The minimum conditions of the FWQMP should be clearly set forth in the conditional waiver or general WDRs and staff should "review" as part of their enforcement follow-up. By employing the Board's enforcement options to address any violators who, for example, fail to prepare a good faith FWQMP, the Board also would be in a position to recover the staff costs of those enforcement efforts.

8. Coordination With Dischargers Folded Into Prioritized Inspection and Enforcement by Regional Board: Along those same lines, any follow-up or coordination with growers re compliance would be part of the annual inspection effort. Compliance inspections would include appropriate compliance advice and be implemented consistent with State Board's existing enforcement policy. Growers would have to allow the Regional Board access to inspect. Prioritization of inspections and level of enforcement actions would be up to the Regional Board. Prioritization would be much easier because staff would already have farm specific FWQMPs and effluent data within the management areas where problems already have been identified, which data would make it much easier for Board staff to prioritize inspections and possible enforcement.

9. Regional Monitoring By Board Expanded to All Dischargers: There is no reason why WDRs or waivers in the ILRP should incorporate a regional monitoring program. No NPDES permits require all municipalities to conduct regional monitoring as part of their permits (CSPA is not suggesting any changes to receiving water quality monitoring currently required by most major NPDES permittees). The industrial storm water and construction storm water permit also do not include such a component. That being said, all of these dischargers should be

contributing a portion of their permitting fees toward an objective and agency-controlled (not discharger-controlled) regional monitoring program. Fees for all of these permittees should be assessed annually. Regional monitoring, including toxicity monitoring, would be conducted by the Regional Board, its consultants or other governmental research entities. CSPA believes regional monitoring is important to determining the overall health of waterways in the Central Valley. However, its inclusion in permits for irrigated lands dischargers takes away resources that need to be focused on implementing BMPs and evaluating their effectiveness at the points of discharge. It also would be fairer that all sources of pollution to the Valley's ambient waters contribute a proportionate share of the funds necessary to conduct regional monitoring. Lastly, by consolidating that program within the Regional Board and other non-discharger agencies – rather than under the current program with inexperienced coalitions made up of discharger representatives – the objectivity of the program will be maintained. Placing regional monitoring in another program outside of the ILRP will of course free up a vast quantity of time currently spent by staff attempting to track the coalitions' various monitoring efforts.

10. Request Additional Fee Authority: Critical to any alternative selected by the Regional Board is a frank request to the State Board to increase current fees to cover all of the costs of the program. It is unreasonable to base a regulatory program regulating the largest source of pollution to Central Valley waters on the political reluctance of the Board or Administration to assess appropriate fees to support a regulatory program that is capable of enforcing statutory and regulatory requirements. The fees for the irrigated lands dischargers, as well as fees on existing NPDES permittees, including stormwater permittees, should also be adjusted to accommodate a separate regional monitoring program.

The Regional Board's review and selection of the above alternative would address many of the legal flaws that currently hamper staff's proposal as well as most of the PEIR's alternatives, discussed at length below. More importantly, CSPA believes that, unlike staff's proposal or Alternatives 1 through 4 of the PEIR, the above alternative would have a reasonable chance of achieving significant reductions in irrigated lands pollution, achieving water quality standards and improving the region's overall economy and quality of life without any significant impact on the agricultural industry.

III. THE PEIR FAILS TO COMPLY WITH CEQA'S PROCEDURAL AND SUBSTANTIVE REQUIREMENTS.

The PEIR fails as an analytical document under CEQA. Arguably, rather than assist the Regional Board with making the tough decisions required to properly regulate the irrigated farm dischargers and ensure compliance with the high quality waters policy

and water quality standards, the PEIR erects a barrier to objective evaluation. Several flaws are worth noting right up front. First is the PEIR's failure to identify a proposed project or an environmentally superior alternative. These omissions make the PEIR unrecognizable as an EIR under CEQA.

The second most egregious flaw stems from the PEIR's premise that the current waiver (Alternative 1) will lead to implementation of the same best practicable control technologies as, for example, Alternative 5. This is entirely baseless given the fact that seven years into implementing Alternative 1, the Regional Board's staff cannot point to a single piece of evidence documenting the implementation of any management practices. Even the much touted management plans that already have been approved by staff under the existing waiver each address management practices by bobbing and weaving – replacing BPTC implementation and effectiveness monitoring with informal office meetings with groups of growers. Occasional meetings cannot verify the implementation or effectiveness of a management practice on a specific farm.

Similarly, the PEIR assumes that the four alternatives that rely on regional monitoring, rather than farm specific monitoring, will be able to evaluate the implementation of BPTC equally as well as Alternative 5, the one alternative that requires edge of field monitoring. Although as explained above, CSPA does not believe the universal and expansive monitoring proposed by Alternative 5 is necessary to take the program to its next effective level, CSPA believes it is obvious that only by monitoring the effectiveness of a claimed BPTC at its point of discharge can the Regional Board or its staff claim to ensure it is in fact BPTC and know what effect the discharge is having on compliance with water quality objectives. It also is even more evident that a regional monitoring location 10, 20, or 30 miles downstream of a specific farm tells neither the agency, the farm nor the general public about the presence or effectiveness of any management measures that may be installed there and whether they amount to BPTC.

These few concerns are only the highlights of a long list of deficiencies in the PEIR. The following addresses each of CSPA's concerns in turn.

A. General Purposes and Standards Under CEQA.

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances). *See, e.g.*, Pub. Res. Code § 21100. The EIR is the very heart of CEQA. *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652. "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal.App.4th 98, 109.

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project.

14 Cal. Code Regs. ("CEQA Guidelines") § 15002(a)(1). "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'" *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 564. The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs*. (2001) 91 Cal.App.4th 1344, 1354 ("Berkeley Jets"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures. CEQA Guidelines § 15002(a)(2) and (3); *See also Berkeley Jets*, 91 Cal.App.4th 1344, 1354; *Citizens of Goleta Valley*, 52 Cal.3d at 564. The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced." Guidelines §15002(a)(2). If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." Pub.Res.Code § 21081; CEQA Guidelines § 15092(b)(2)(A) & (B).

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A 'clearly inadequate or unsupported study is entitled to no judicial deference.'" *Berkeley Jets*, 91 Cal.App.4th at 1355 (emphasis added), quoting, *Laurel Heights Improvement Assn. v. Regents of University of California*, 47 Cal. 3d 376, 391 409, fn. 12 (1988). As the court stated in *Berkeley Jets*, 91 Cal.App.4th at 1355:

> A prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal. App. 4th 713, 722]; *Galante Vineyards v. Monterey Peninsula Water Management Dist*. (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946).

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B. The PEIR fails to include a stable project description - indeed, no proposed project is included.

The PEIR does not evaluate a proposed project. The PEIR attempts to portray this omission as a benefit: "Rather than the typical EIR approach of starting with a project and then looking at alternatives to that project, this draft PEIR will be used as a tool to inform decision makers during the selection process." PEIR, p. 2-1. *See also* p. 2-5 ("In this document, … no preferred project has been identified by the Lead Agency from among the considered alternatives"). The drafters overlook, however, that CEQA sets forth the necessary contents of an EIR that can properly serve as a tool to inform the Regional Board. The drafters, staff and the Regional Board do not have any authority to omit a description of the proposed project from the PEIR.

"An accurate, stable and finite project description is the *sine qua non* of an informative and legally adequate EIR." *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192; *Berkeley Jets*, 91 Cal.App.4th at 1354; *Sacramento Old City Assn. v. City Council* (1991) 229 Cal. App. 3d 1011, 1023; *Stanislaus Natural Heritage Project v. County of Stanislaus* (1996) 48 Cal. App. 4th 182, 201. "[A] curtailed or distorted project description," on the other hand, "may stultify the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental costs, consider mitigation measures, assess the advantage of terminating the proposal (*i.e.*, the "no project" alternative) and weigh other alternatives in the balance." *Id. See also*, CEQA section 15124; *City of Santee v. County of San Diego*, 263 Cal.Rptr 340 (1989). As one commenter has noted:

> The adequacy of an EIR's project description is closely linked to the adequacy of the EIR's analysis of the project's environmental effects. If the description is inadequate because it fails to discuss the complete project, the environmental analysis will probably reflect the same mistake. (Kostka and Zischke, "Practice Under the California Environmental Quality Act," p. 474 (8/99 update).)

A "rigorous analysis" is required to dispose of an impact as insignificant. *Kings County Farm Bureau v. City of Hanford*, 221 Cal.App.3d 692 (1990). Such a rigorous analysis is not possible if the project description is inaccurate, inconsistent, misleading or, in the case of the PEIR, completely absent.

C. The Objectives Borrowed From The Stakeholder Process Attempt To Lend Support To Purported Benefits of Elements of Alternative 1 – Including Its Regional Planning Basis And Lack Of Farm Specific Information of Any Sort – Which Are Its Main Faults.

The PEIR's objectives rely heavily on objectives formulated through the stakeholder process coordinated by the Regional Board's staff. The stakeholder process was dominated by agricultural interests. http://www.swrcb.ca.gov/centralvalley/water_issues/irrigated_lands/long_term_program_development/advisory_

wrkgrp_member_lst.pdf; *See, e.g.* 11 May 2010 Long-term ILRP Meeting Attendees (http://www.swrcb.ca.gov/centralvalley/water_issues/irrigated_lands/long_term_program_development/11may10_stakeholder_mtg/11may10_sum.pdf). Although CSPA, for example, nominally is identified as one of the stakeholders involved in the process, CSPA was one of many groups that did not have the resources to attend numerous meetings, conduct multiple reviews of numerous documents, and participate actively in the stakeholder process. Possibly as a result of the lack of representation from a broader spectrum of stakeholders, CSPA is concerned with language included in the objectives that biases the selection of an alternative in favor of those that do not address compliance with all water quality objectives throughout the region, that water down the high quality waters policy requirement that implementation of BPTC be ensured, and that include only regional monitoring.

An overly narrow definition of project objectives renders the alternatives analysis inadequate. To narrowly define the primary "objective" of the proposed project itself constitutes a violation of CEQA since such a restrictive formulation would improperly foreclose consideration of alternatives. *See City of Santee v. County of San Diego* (1989) 214 Cal.App.3d 1438 (holding that when project objectives are defined too narrowly an EIR's treatment of analysis may also be inadequate). As a leading treatise on CEQA compliance cautions, "[t]he case law makes clear that…overly narrow objectives may unduly circumscribe the agency's consideration of project alternatives." (Remy, Thomas, Moose & Manley, Guide to CEQA (Solano Books, 2007), p. 589).

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he project's objective to restore or maintain "appropriate" beneficial uses qualifies the Regional Board's duty to maintain all existing or designated beneficial uses.

The first objective identified for the ILRP is to "[r]estore and/or maintain appropriate beneficial uses established in Central Valley Water Board water quality control plans by ensuring that all state waters meet applicable water quality objectives." PEIR, p. 1-2. CSPA is concerned with the PEIR's inclusion of the term "appropriate." Neither the Water Code nor the Basin Plan qualify the Regional Boards' or dischargers' obligation to assure attainment of water quality standards by deeming some designated beneficial uses as inappropriate. This language should be revised to clarify that all designated or existing uses must be protected, including those designated by way of the Basin Plan's tributary rule.

2. The objective to encourage implementation of BMPs is inconsistent with Resolution No. 86-16's duty that the Regional Board ensure implementation of all best practicable control technologies.

The second objective is to "[e]ncourage implementation of management practices. . ." PEIR, p. 1-2. The notion that the Regional Board should limit its authority to "encouraging" the implementation of BMPs appears inconsistent with its duties under Porter-Cologne. The Regional Board must establish requirements that implement the

water quality objectives. Water Code § 13263(a) ("[t]he requirements shall implement any relevant water quality control plans. . . ."); § 13269(a) (waivers must be "consistent with any applicable state or regional water quality control plan . . ."). Merely encouraging BMPs will not achieve objectives.

3. The objective to provide incentives to minimize waste discharges cannot be construed to allow less monitoring without any proof that waste discharges have been minimized.

The third objective includes to "[p]rovide incentives (i.e., financial assistance, monitoring reductions, certification, or technical help) for agricultural operations to minimize waste discharge to state waters from their operations." PEIR, p. 1-2. By specifying the incentives, CSPA believes this objective greases the skids for an alternative that trades away important components of any successful program. In particular, by specifically trading away monitoring of specific discharges, the objective directly undermines the Regional Board's ability to implement the high quality waters policy's BPTC requirement as well as the Nonpoint Source Plan's monitoring requirements. CSPA believes an order with clear requirements is incentive enough and this objective merely opens the door to alternatives that violate relevant law and will once again prove ineffective. Any incentives should be based on encouraging growers to pollute less, not, for example, agreeing to give up essential site specific monitoring for participation in a less effective regional monitoring program.

4. If the objective to coordinate with other regional programs means to mimic the regional scope of other ineffective pollution control programs, then this objective is inconsistent with the other three objectives.

The fifth objective is to "[p]romote coordination with other regulatory and non-regulatory programs associated with agricultural operations . . . to minimize duplicative regulatory oversight while ensuring program effectiveness." PEIR, p. 1-2. This objective, although sounding innocuous, is interpreted by staff as favoring alternatives that take a regional perspective like other programs referenced in the objective. *See* Staff Report, p. 103 (Alternatives 1 and 2, "[r]egional configuration for water quality plans and monitoring would facilitate efficient coordination with other programs operating at the regional level" and Alternatives 3-5, "…the farm-level management would not promote this coordination.") Unfortunately, the record is clear that none of the other regional efforts have been successful at preventing the widespread surface water pollution and toxicity from irrigated lands. If coordination with regional programs means that the program must replicate the regional scales of other unsuccessful programs and thus replicate their inability to protect water quality since their inception, then this objective is inappropriate and inconsistent with the objective to restore water quality and meet water quality standards. The objective should be clarified to promote coordination without necessarily copying the ineffective regional programs already in place.

D. The PEIR fails to identify the superior alternative.

By choosing not to propose a project, it is hardly surprising that the PEIR does not identify the superior environmental alternative. One of CEQA's fundamental requirements is that the DEIR must identify the "environmentally superior alternative." CEQA Guidelines §1526.6(e)(2); Kostka & Zischke, *Practice Under the California Environmental Quality Act* §15.37 (Cont. Educ. Of the Bar, 2008). Typically, a DEIR identifies the environmentally superior alternative, which is analyzed in detail, while other project alternatives receive more cursory review.

The lead agency is required to select the environmentally preferable alternative unless it is infeasible. A "feasible" alternative is one that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors. Pub. Res. Code § 21061.1; CEQA Guidelines § 15364. California courts provide guidance on how to apply these factors in determining whether an alternative or mitigation measure is economically feasible.

Since the PEIR fails to identify the environmentally superior alternative, there is not adequate analysis of its impacts or feasibility. *See Burger v. County of Mendocino* (1975) 45 Cal.App.3d 322 (county's approval of an 80 unit hotel project over a smaller 64 unit alternative was not supported by substantial evidence); *County of El Dorado v. Dept. of Transp*. (2005) 133 Cal.App.4th 1376 (agency must consider small alternative to casino project). Here, although suffering from its own defects (*see infra*, Section IV), the economic analysis prepared for the Regional Board indicates that all of the alternatives identified in the PEIR are economically feasible. Indeed, the alternatives with the most regulatory oversight expand the overall economy of the Central Valley. Because the alternatives are all feasible, the PEIR needed to select an environmentally preferable alternative.

E. The PEIR Does Not Provide Meaningful Comparative Analysis of the Selected Alternatives Because the Assumption That All Five Alternatives Would Be Equally Effective at Implementing BPTC and Achieving Standards is Unsupported by Any Evidence

As noted above, the PEIR fails to facilitate the Regional Board's selection of a new ILRP because the PEIR is based on a fiction that any program – no matter how far removed from the discharge locations and no matter how hard it may avoid documenting and measuring the implementation and effectiveness of BMPs – will result in the same level of pollution control. That core fiction does not allow for a meaningful comparative analysis by the Regional Board of the various alternatives.

CEQA requires that an EIR provide a discussion of project alternatives that allows meaningful analysis. *Laurel Heights I,* 47 Cal.3d at 403. The analysis of project alternatives must contain an accurate quantitative assessment of the impacts of the

alternatives. In *Kings County Farm Bureau*, 221 Cal.App.3d at 733-735, the court found the EIR's discussion of a natural gas alternative to a coal-fired power plant project to be inadequate because it lacked necessary "quantitative, comparative analysis" of air emissions and water use.

The PEIR does not attempt to estimate the relative effectiveness of the five alternatives. It generally assumes that they will all lead to sufficient pollution reductions. For example, the PEIR "assume[s] that continuation of the program would result in implementation of a greater number of surface water management practices than are present under baseline conditions, due to continued use of the program's monitoring feedback loops." PEIR, p. 5.7-45. Given the current absence of information about any BMPs actually installed, never mind whether they amount to BPTC, after seven years of implementing Alternative 1, the PEIR's assumption is entirely unsupported. The PEIR also asserts that "[u]nder all program alternatives, when a constituent of concern is identified through monitoring, management practices would be used to reduce the level of that constituent in surface water or groundwater." PEIR, p. 5.7-43. The PEIR repeats that, for each alternative, the "[p]otential impacts related to vegetation and wildlife under Alternative 3 are expected to be as described for Alternative 2. Like Alternative 2, Alternative 3 would implement water quality management plans that would result in a beneficial impact on surface water quality and groundwater quality, which would ultimately benefit both vegetation and wildlife communities." PEIR, p. 5.7-48. By making believe that all of the alternatives will have a beneficial effect on water quality – despite their obvious differences – the PEIR makes no effort to compare the relative effectiveness and certainty of each alternative in meeting standards or reducing pollution.

Obviously, of the flawed alternatives included in the PEIR, some have more certainty of achieving pollution reductions than others. Nothing in the record demonstrates that Alternative 1, seven years after its enactment, has reduced the volume or toxicity of pollution discharges from irrigated lands. There is no evidence in the Regional Board's files or discussed in the PEIR of what, if any, management practices have been or will be installed under the existing program. There is no discussion of evidence of any observable trends in ambient water quality conditions related to the existing program. There is certainly no evidence of any data showing any trends in pollution reductions at the edge of fields based on management measures applied to those fields. As a result, all of the evidence is that implementation of Alternative 1 and the even weaker Alternative 2 will most likely allow increases in pollution.

Contrary to the claims that all of the alternatives are interchangeable from a water quality perspective, one section of the PEIR discussing impacts to fish acknowledges that some alternatives (Alternatives 4 and 5) will "probably be greater." PEIR, pp. 5.8-52-53. Although still sorely lacking in providing the "quantitative, comparative analysis" required by CEQA, the fisheries section does at least

acknowledge that additional monitoring and additional management practices will result in less pollution being discharged.

> given the probability of increased monitoring of individual farms, and especially those at higher risk of generating significant impacts—in addition to wellhead protection, nutrient management plans, tracking of nutrient and pesticide application, and monitoring of individual wells—the positive benefit of Impact FISH1 (improved water quality) would probably be greater under Alternative 4 than under Alternative 2 or Alternative 3.

PEIR, p. 5.8-52. Likewise, contrary to the discussion of water quality, the PEIR does acknowledge in the fisheries discussion that "the positive benefit of Impact FISH1 (improved water quality) probably would be greater under Alternative 5 than under any other alternative." PEIR, p. 5.8-53. These acknowledgements contradict the PEIR's earlier unreasonable assertions that the water quality benefits of each of the alternatives are similar despite their drastic differences in monitoring requirements and management practices oversight. The PEIR's refusal to acknowledge the failure of the existing program to document any BMP implementation or water quality improvements frustrates rather than facilitates the Regional Board's decision-making. A true quantitative comparison of alternatives 2, 3, and 4 incorporating one or more of the main flaws of Alternative 1, including for example reliance solely on regional monitoring to detect and evaluate BMPs, would demonstrate they will prove equally ineffective. CSPA believes the PEIR should be rewritten to include the required comparative analysis on staff's proposed alternative (perhaps with some improvements – *see* Section V below), CSPA's proposed alternative (Section II above), and perhaps one or two other of the existing alternatives.

F. The Regional Board May Not May Not Approve Four Out Of Five Of The Proferred Alternatives Because They Would Conflict With Other Laws, i.e. Porter-Cologne.

A lead agency may not approve a project with significant unavoidable impacts unless it is "otherwise permissible under applicable laws and regulations." CEQA §21002.1(c). Likewise, as the PEIR acknowledges, "[t]o be considered as an alternative under CEQA, ILRP alternatives . . . must . . . meet statutory requirements established in applicable state policy and regulations (e.g., . . ., the State Water Resources Control Board *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* [State Water Board 2004], and the State Antidegradation Policy [State Water Board 1968])." PEIR, p. 2-8.

The PEIR states that all of the alternatives will have a significant unavoidable impact on prime agricultural lands. PEIR, Summary, p. 1-13. CSPA also believes that every alternative considered in the PEIR will have unavoidable impacts to water quality and fisheries, at least in the near term and for several of the alternatives for the indefinite future. As discussed below, Alternatives 1 through 4 all violate the State's antidegradation policy and the Nonpoint Source Control program. Therefore, only one

of the alternatives considered by the Regional Board (at least as currently formulated) can be approved despite any significant unavoidable impacts – Alternative 5.

1. The first four alternatives all violate the state's antidegradation policy.

The State Board's "Statement of Policy With Respect to Maintaining High Quality of Waters in California" provides, in relevant part, that:

> Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

Resolution No. 68-16 (Oct. 28, 1968) (emphasis added). As Regional Board staff explains, "In determining BPTC, the discharger should compare the proposed method to existing proven technology; evaluate performance data (through treatability studies), compare alternative methods of treatment or control, and consider the method currently used by the discharger or similarly situated dischargers." Staff Report, p. 62 (citing SWRCB Order Nos. WQ 81-5, WQ 82-5, WQ 90-6, and WQ 2000-07)." To comply with Resolution No. 68-16's BPTC mandate, the Regional Board "must require the discharger to demonstrate that the proposed manner of compliance constitutes BPTC." *Id*. (citing SWRCB Order No. WQ 2000-7) (emphasis added). *See also id*. p. 67 ("where degradation is occurring, irrigated agricultural operators must *demonstrate* that any set of practices proposed for implementation represents BPTC and will be required to consider existing water quality data or conduct monitoring in support of this demonstration").

Under the existing program, not one irrigated lands discharger has complied with Resolution No. 68-16's BPTC requirement. The Regional Board is entirely in the dark regarding what, if any, measures have been implemented never mind whether they amount to BPTC. Given that the existing management plans' only map out a series of meetings between coalitions and groups of dischargers to discuss measures the dischargers may have planned, there is nothing in Alternative 1 or its mirror proposal, Alternative 2, that would cure these universal violations of the BPTC requirement. *See* Staff Report, p. 115 ("Alternative 1 would not implement the iterative BPTC and monitoring process for addressing degradation to groundwater").

Alternatives 3 and 4 also succumb to the absurd notion that downstream regional monitoring alone can somehow implement Resolution No. 68-16's BPTC requirement. Although these alternatives both close some of the gap in implementing the BPTC requirement by requiring irrigated lands dischargers to prepare farm-specific Farm Water Quality Management Plans ("FWQMPs"), the omission of monitoring to determine the effectiveness of those measures means the Regional Board will not know whether

the measures are BPTC. Alternative 3 omits any surface or groundwater quality monitoring, essentially erasing the BPTC requirement. *See* Staff Report, p. 116 ("Surface and/or groundwater quality monitoring would not be required under Alternative 3 to determine effectiveness of BPTC and whether degradation is occurring"). Alternative 4, to the extent it allows dischargers to forego farm specific monitoring in exchange for participating in regional monitoring, cannot reasonably be claimed to identify BPTC many miles upstream of the monitoring location. Nor would measurements of pollution downstream at levels below applicable criteria indicate whether or not waters upstream – shallower and perhaps closer to various pollution discharges – were being degraded by irrigated lands discharges. Any resort to regional monitoring without a farm-specific monitoring component cannot meet Resolution No. 68-16's requirement. The Staff Report does not explain how regional monitoring would suffice to determine whether upstream measures are BPTC or the presence and extent of upstream degradation. *See* Staff Report, p. 116.

Of the five alternatives considered in the PEIR, only Alternative 5 is consistent with Resolution No. 68-16. That alternative requires discharges to identify the measures they are installing or implementing and it requires monitoring of the measure's effectiveness (though as CSPA notes below, Alternative 5 is weighted down with too much monitoring).

As the staff acknowledges, "With regard to selection of measures and practices, the Central Valley Water Board and USEPA recognize that there is often site-specific, crop-specific, and regional variability that affects the selection of appropriate management measures, as well as design constraints and pollution-control effectiveness of various practices." Staff Report, p. 66-67. Because BPTC and compliance with the state's antidegradation policy is ultimately a farm specific question, there is no getting around the fact that to implement the policy, one must identify and measure BPTC at the farm level. *See PEIR, p. 3-9* ("The appropriate management practice is typically selected on a site-specific or property-specific basis"). It is simply ridiculous to claim that one can determine that a discharger has installed BPTC by measuring ambient water quality many miles downstream. If that were the case, the regional monitoring that has occurred under Alternative 1 for the last seven years would already allow the Regional Board to evaluate BPTC throughout the region. Of course, the opposite is true. The Regional Board has no idea what, if any, measures have been installed and whether they amount to BPTC. Alternatives that continue the current failure to apply Resolution No. 68-16 to tens of thousands of dischargers of toxic and impairing pollutants and vast swaths of the State's inland waters amount to licenses to degrade water. CSPA agrees that farmers can have flexibility but they have to tell the Boards and the public what they decided to implement and then measure its effectiveness to comply with the BPTC requirement.

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2. Alternatives 1 through 4 violate the NPS Policy

Alternatives 1 through 4 also are inconsistent with the State Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (May 20, 2004) ("NPS Policy"). Any NPS program must be consistent with five key elements of the NPS Policy. Alternatives 1 through 4 are all inconsistent the NPS Policy's element requiring compliance with Resolution No. 86-16. Alternatives 1 and 2, as well as the staff's recommended program, fail to comply with second and fourth key elements as well. Alternatives 3 and 4 also fall short of the second and fourth elements to the extent they call for no water quality monitoring or only regional water quality monitoring. Each of the four relevant elements is discussed in turn.

Key element 1 states that "[a]n NPS control implementation program's ultimate purpose shall be explicitly stated. Implementation programs must, at a minimum, address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements." NPS Policy, pp. 11-12. As discussed above, Alternatives 1 through 4 do not comply with Resolution No. 68-16. Hence, they also cannot comply with Key Element 1 of the NPS.

Key element 2 provides that: "[a] nonpoint-source control implementation program must include a description of the management practices and other program elements that are expected to be implemented to ensure attainment of the implementation program's stated purpose, the process to be used to select or develop management practices, and the process to be used to ensure and verify proper management practice implementation." NPS Policy, p. 12. "A RWQCB must be convinced there is a high likelihood the MP will be successful." *Id*. In regard to discharges from irrigated lands, this element of the NPS Policy effectively requires farm-based water quality management plans, or their equivalent. "MPs must be tailored to a specific site and circumstances, and justification for the use of a particular category or type of MP must show that the MP has been successfully used in comparable circumstances. If an MP has not previously been used, documentation to substantiate its efficacy must be provided by the discharger." *Id*., p. 12. In this case, the dischargers are the individual farms and the only way to document the efficacy of a specific management practices for their particular lands is for them to tell the Regional Board what they are doing and why. Likewise, in order "to ensure and verify proper management practice implementation" for irrigated lands, the farms must report on their implementation, including pollutant specific monitoring of the BMP's resulting effluent. Because Alternatives 1 and 2 do not include FWQMPs, they cannot comply with key element 2. Likewise, Alternatives 1 and 2 and Alternative 4's reliance on regional monitoring also cannot comply with key element 2's verification requirement. Alternative 3 has no water quality monitoring at all and, thus, in the context of irrigated lands management practices, cannot verify the effectiveness of any management practice.

Key element 3 of the NPS Policy provides that "[w]here the Regional Water Board determines it is necessary to allow time to achieve water quality objectives, the nonpoint-source pollution control implementation program must include a specific time schedule and corresponding quantifiable milestones designed to measure progress toward reaching the specified requirements." NPS Policy, p. 13. Although CSPA may not be opposed to reasonable time frames for irrigated lands dischargers to come into compliance with the requirements of a revised program, the PEIR and staff report need to be clarified to acknowledge that the Regional Board may not have authority to include schedules of compliance in either WDRs or conditional waivers because the Central Valley Bain Plan fails to include any such authority in its program to achieve the applicable water quality standards. *See* Water Code § 13242(b) (program to achieve standards must include "[a] time schedule for actions to be taken" – if no time schedule provided in Basin Plan, no authority); Basin Plan, p. IV-16 (compliance schedules only authorized for NPDES permits). The Board's authority appears to be limited to adopting time schedules through enforcement orders. The documents also should be careful to emphasize the NPS Policy's requirement that, assuming such schedules are authorized in the Basin Plan, the schedules "may not be longer than that which is reasonably necessary to achieve an NPS implementation program's water quality objectives."

Key element 4 requires that "[a]n NPS pollution control implementation program must include sufficient feedback mechanisms so that the Regional Water Board, dischargers, and the public can determine whether the program is achieving its stated purpose, or whether additional or different management practices or other actions are required." NPS Policy, p. 13. "In all cases the NPS control implementation program should describe the measures, protocols, and associated frequencies that will be used to verify the degree to which the MPs are being properly implemented and are achieving the program's objectives, and/or to provide feedback for use in adaptive management." *Id*. "[I]f the program relies upon dischargers' use of MPs, there should be a strong correlation between the specific MPs implemented and the relevant water quality requirements." *Id*., p. 12. In the context of irrigated lands, this key element requires reporting and monitoring. It is impossible to describe the management practices that were used and a "strong correlation" between the management practices and water quality standards without FWQMPs and annual reporting. And it is impossible to determine that the management practices are effective without reports from the discharger that they have been properly implemented and monitored to confirm they have reduced pollution. Alternatives 1 through 4 do not achieve this level of comprehensible feedback.

Key element 5 requires that "[t]he Regional Water Board must make clear, in advance, the potential consequences for failure to achieve a nonpoint-source pollution control implementation program's stated objectives." Neither Alternative 1 nor 2 make clear the consequences of any failures by coalitions. No coalition or discharger takes seriously the notion that a coalition will be dissolved for failing to comply with the program's requirements. In essence, the coalition-based alternatives require the Regional Board to dissolve an entire watershed program – with nothing in place to back

it up once it is gone. The Regional Board would appear to punish itself as much as the dischargers under these scenarios. Likewise, as for Alternatives 3 and 4, the consequences of failure also are not clear because the proposals do not include monitoring of the individual dischargers. Although these alternatives have the Regional Board involved (CSPA believes unrealistically) in the development of the FWQMPs, without management practice effluent data and only sporadic site inspections by staff, there are no clear consequences for noncompliance by individual dischargers.

G. The PEIR Fails To Consider a Reasonable Range of Alternatives Because Most of the Alternatives are Weighted Down With Components That Render Them Ineffective.

Because four out of the five alternatives considered in the PEIR are not viable because they violate some of the elemental water quality regulations, the Regional Board is left with only a single feasible alternative – Alternative 5. *See* PEIR, p. 2-8 ("Alternatives must … meet statutory requirements established in applicable state policy and regulations"). This is not a reasonable range of alternatives. Even assuming one additional alternative – Alternative 4 – comes close to being legal and thus feasible, the Board is still left with only two options. The Regional Board should redraft the PEIR to focus on feasible alternatives. These would include in addition to Alternative 5, staff's proposed program (although as discussed below, staff's proposal is also inconsistent with the PS Policy and Resolution No. 68-16), CSPA's proposed alternative above, and at least one other variation that includes FWQMPs and farm-specific monitoring for at least some portion of the discharging farms.

An EIR must describe a range of reasonable alternatives to the Project, or to the location of the Project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. "An EIR's discussion of alternatives must contain analysis sufficient to allow informed decision making." *Laurel Heights I*, 47 Cal.3d at 404. An EIR must also include "detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project." *Id*. at 405.

In addition to their failure to comply with Resolution No. 68-16 and the NPS Policy, CSPA also believes the alternatives considered in the PEIR suffer from the following defects.

1. The ILRP Should Not Rely on Coalitions to Implement or Comply with Irrigated Lands Program.

What, if any, value the existing coalitions may have brought to the program to facilitate some of the regional monitoring and performing outreach to growers, has now passed. The ILRP, to be effective, must now concentrate on getting individual farmers to take actions necessary to control their pollution discharges and document implementation of BPTC. CSPA's review of the coalitions' management plans approved

by the Regional Board under the existing program shows that the coalitions have no intention of documenting each farm's management measures or their effectiveness. Instead, as their management plans make clear, the coalitions propose to replace various office meetings with groups of growers as a surrogate for documenting each farm's BMPs and their effectiveness. Of course, to confirm the selection, implementation and monitoring of BPTC on each farm, each farm must provide that information. Adding a layer of unofficial bureaucracy with an interest in obscuring information from both the Board and the public does not add any efficiency to the program. In 2003, CSPA pointed out that:

> If one thing is clear, the existing Coalition program has managed to mask from the Regional Board what is going on on-the-ground at most of the farms around the Valley. As several Board members commented and as is painfully evidenced from reviewing the available documents, we still do not have the most basic information about what, if any, BMPs are being applied in the fields, where they're being applied, whether they are working or improving the quality of discharges and what other BMPs might be tried in the future.

Letter from Law Office of Michael R. Lozeau on behalf of Deltakeeper, pp. 5-6 (Nov. 4, 2005). Remarkably, seven years later, the mask erected by the coalitions remains in place. Neither the Board nor the public has any idea what if any management practices have been proposed or implemented by any of the estimated 30,000 farms in the Central Valley. *See e.g.*, Technical Memo, p. 1-2 ("Although Alternative 1 represents the continued implementation of current Central Valley Water Board policies, limited information was available to determine the extent of management practice implementation to date"); *Id*., p. 2-2 ("Conceptually, the best source of this type of information would be growers or grower coalitions. Because this information was not widely available, other sources were used to estimate the existing conditions (NRCS 2005; DWR 2001)"); Staff Report, p. 117 (explaining that only effort to date by coalitions to "track the progress of management practice implementation through the results of periodic surveys sent to growers"). Nor does the informal effort of the coalitions to collect the farm-specific data appear to have changed since the Regional Board's approval of management plans. *See, e.g.* East San Joaquin Water Quality Coalition Web Site ("Properties adjacent to or in close proximity to each waterway sampled by the Coalition are the primary focus of mailings and notices for local workshops that cover BMPs to solve the water quality problem"); San Joaquin County and Delta Water Quality Coalition, 2010 Annual Monitoring Report, p. 4 (March 1, 2010) (focused outreach in three subwatersheds consists of asking growers to complete surveys and then conducting unspecified follow-up with growers). The next phase of the ILRP cannot allow coalitions to continue and further obstruct the Board's collection of <u>discharger</u> information.

The use of coalitions also will continue to undermine the Regional Board's enforcement discretion. As the staff acknowledges, by relying on coalitions, the Board effectively limits the availability of all of its enforcement tools. 'The Central Valley

Water Board does not have any direct enforcement authority over a third-party group that is not responsible for the waste discharge (i.e., the Board cannot take enforcement against the coalition." Staff Report, p. 117. The only option available to the Regional Board to address coalitions' noncompliance is not to enforce the requirements, but to eliminate the entire program within large areas of the Central Valley. Rather than a readily available and precise tool available to the Regional Board, like a notice of violation or an administrative civil liability, a decision to dismantle the ILRP for an entire area would be the least likely response the Board would want to take and would not be commensurate with the scope and seriousness of most of the violations the Board was trying to address. The coalitions also undermine the Board's ability to effectively enforce against individual dischargers as well by failing to collect the necessary data regarding management practices on individual farms and otherwise obstructing or slowing down the review and analysis of that information. *See* Staff Report, p. 140 (discussing Alternative 1, "the Board . . . would not have information regarding the method(s) and practices the operation has or plans to implement to work toward solving identified water quality concerns").

Staff's proposal argues that the presence of coalitions will "take advantage of local knowledge and administrative/cost efficiencies in dealing with a few groups versus thousands of individual operations." Staff Report p. 3. The only administrative/cost efficiencies visible from the record are those realized by the coalitions' successful effort to date to avoid gathering the key information and data that is necessary to implement a successful program – farm-specific management practices and monitoring data to prove they have been implemented and are effective at reducing the pollutants of concern. It makes no sense that establishing an intermediate layer of bureaucracy between the dischargers who have the information and the agency that needs to know the information makes that process more efficient.

Nor do the coalitions bring the local knowledge necessary for a successful ILRP. If anything, the coalitions are preventing local knowledge of each farm from reaching the Board. As far as CSPA can tell, staffing by the coalitions consists of a few staff for each coalition. There is no reason that the Regional Board itself could not provide the same local presence by modestly expanding its staff and gain efficiencies by cutting out the middleman. To the extent any alternative proposes to rely on coalitions who are not themselves dischargers to conduct sampling, gather information, and prepare plans and reports pursuant to a conditional waiver or WDRs, the program will continue to fail to measurably reduce any pollution discharges and perpetuate or worsen the existing pollution discharges from irrigated lands.

2. Alternatives that rely solely on regional monitoring to determine the adequacy of BPTC or enforcement of individual farms are destined to fail and do not meet CEQA's duty to mitigate impacts.

The four alternatives that rely on regional monitoring to determine that the program is reducing, rather than increasing, pollution discharges and that management

practices are installed and equal to BPTC, do not provide for the mitigation of impacts required by CEQA. CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and mitigation measures. CEQA Guidelines § 15002(a)(2) and (3); *See also*, *Berkeley Jets*, 91 Cal. App. 4th 1344, 1354; *Citizens of Goleta Valley*, 52 Cal.3d at 564. The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced." CEQA Guidelines §15002(a)(2). If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." Pub. Res. Code § 21081; CEQA Guidelines § 15092(b)(2)(A) & (B).

In general, mitigation measures must be designed to minimize, reduce or avoid an identified environmental impact or to rectify or compensate for that impact. CEQA Guidelines § 15370. Where several mitigation measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified. *Id.* at § 15126.4(a)(1)(B). A lead agency may not make the required CEQA findings unless the administrative record clearly shows that all uncertainties regarding the mitigation of significant environmental impacts have been resolved. A public agency may not rely on mitigation measures of uncertain efficacy or feasibility. *Kings County Farm Bureau*, 221 Cal.App.3d at 727 (finding groundwater purchase agreement inadequate mitigation measure because no record evidence existed that replacement water was available). "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors. CEQA Guidelines § 15364. Mitigation measures must be fully enforceable through permit conditions, agreements or other legally binding instruments. *Id.* at § 15126.4(a)(2).

By not requiring any farm-specific mitigation measures, Alternatives 1 and 2 fail to meet CEQA's mitigation requirements. These two alternatives make no effort to resolve the vast uncertainties surrounding the selection and implementation of management practices on irrigated lands throughout the Central Valley, the very mitigation measures relied upon by the PEIR to find that impacts to water quality will be less than significant. Despite the PEIR's acknowledgement that "[t]he appropriate management practice is typically selected on a site-specific or property-specific basis[,]" Alternatives 1 and 2 do not include any site-specific BPTC requirements that are or will be fully enforceable.

Similarly, Alternatives 3 and 4, although requiring FWQMPs that would require, in the future, individual farms to describe their management practices, the absence of any farm specific and BMP-specific monitoring to confirm their implementation and effectiveness also fails to eliminate the rampant uncertainty regarding BMP implementation and their effectiveness at reducing pollution from specific farms. And, again, making believe that one can monitor for the implementation and effectiveness of

management practices on a specific farm from several miles downstream makes any management practice mitigation unenforceable, never mind fully enforceable.

3. Alternative 3 includes components that begin to address the shortcomings of the current program but is weighed down with odious requirements and illegal delegation of Board responsibilities.

Although flawed, some of the alternatives described in the PEIR include components that CSPA believes are necessary to an effective ILRP. However, in each instance, the PEIR weighs down the effective components with various poison pills and odious requirements that stifle any serious consideration of alternatives that substantially change the current program. Additional comments and flaws in Alternative 3, in addition to the absence of any effluent quality monitoring discussed above, include the following.

Alternative 3 does include the important requirement that all irrigated land dischargers prepare a FWQMP. CSPA believes this requirement is fundamental to a program that will achieve BPTC, achieve water quality standards and allow proper oversight by the Regional Board. However, the 2-year time period for developing a FWQMP should be shortened to 6 months for surface water discharges and one year for groundwater discharges.

Alternative 3's proposal that the Regional Board review and approve every FWQMP is unrealistic and unnecessary. *See* PEIR, p. 3-14 ("Review applications and determine priorities for FWQMP review and approval"); p. 3-16 ("Submit the FWQMP for review and approval by the Central Valley Water Board"). As proposed, the task of reviewing in advance each and every FWQMP is unrealistic. Moreover, such review and approval would be a desk top review of whatever information is included in the FWQMP without the benefit of any field observations. This process would simply repeat the currently inadequate surveys and informal meetings which the coalitions claim can accurately evaluate management practice implementation and effectiveness. Rather than requiring review of and approval of all FWQMPs, the program should specify in sufficient detail the contents of the FWQMP and require them to be submitted under penalty of perjury. CSPA also believes there is a role for an iterative process. The requirements for the FWQMP should include requiring additional management practices wherever effluent data indicates that pollutant discharges are not decreasing or standards are being violated. Any review by the Board staff would be in the context of reviewing for compliance and prioritizing any inspections and enforcement investigations. Staff also could, of course, require additional measures or monitoring for specific problem farms.

Similarly, because such up front review and approval is unnecessary, any resources expended to review proposals by third-parties to take over such review and approval of FWQMPs is also unnecessary. To the extent the Board thought it was

possible to review and approve every FWQMP, farming that task out to third parties would be an illegal delegation of discharge requirements. Water Code § 13223.

CSPA certainly agrees that the Regional Board should prioritize and conduct a significant number of site inspections every year. It is through this oversight and enforcement process that CSPA believes the Regional Board can realistically and accurately review a specific farm's FWQMP to determine its compliance with the program requirements. Likewise, to the extent the Board staff wanted to "coordinate" with a specific farmer or even a group of farmers, such an inspection would be the opportunity for coordination. By including effluent monitoring, the Regional Board would have a better means of prioritizing its inspections and evaluating whether management practices are BPTC. By publicizing through Board meetings and the web site the outcome of these inspections including any "certifications" issued or, equally important, enforcement responses by the Board or staff, CSPA believes that the Regional Board would be taken seriously by a much larger percentage of individual dischargers who would then seek to comply with BPTC and water quality standards.

As discussed in various sections of these comments above, Alternative 3's failure to require any farm-specific water quality monitoring is a fatal flaw. *See* PEIR, p. 3-16 ("unless specifically required in response to water quality problems, owners/operators would not be required to conduct water quality monitoring of adjacent receiving waters or underlying groundwater"). CSPA believes that monitoring of discharged effluent is what needs to be required to determine compliance with both the BPTC requirement and applicable water quality standards. As outlined in CSPA's proposed alternative, such monitoring should be limited to Tier 2 and Tier 3 dischargers within areas covered by management plans and limited to basic parameters plus any pollutants triggering the management plan. CSPA agrees that visual monitoring does have a role but cannot be the only monitoring. CSPA has many years of experience reviewing annual reports and initiating enforcement actions under the Statewide General Industrial Storm Water Permit. The visual monitoring conducted under that permit is of limited value to documenting pollution discharges or BMP effectiveness (though with appropriate photographs, visual monitoring can document the installation of BMPs and their condition).

4. Alternative 4 includes fewer poison pills but its failure to require BMP and effluent monitoring means that it would not achieve water quality objectives or ensure implementation of BPTC.

Alternative 4 also includes a number of components that CSPA believes are key components to a successful ILRP, including FWQMPs and a tiering component to guide both BMP implementation and different levels of monitoring. Alternative 4 proposes the same procedures for preparing, reviewing and approving FWQMPs. CSPA agrees with requiring all dischargers to prepare and implement FWQMPS but CSPA has the same concerns with the FWQMP procedures discussed for Alternative 3 above.

The key difference proposed in Alternative 4 would be the inclusion of a tiering system to guide dischargers on the proper levels of BMPs they should be considering as well as the intensity of monitoring that is required. PEIR, p. 3-17 ("The tiers represent fields with minimal (Tier 1), low (Tier 2), and high (Tier 3) potential threat to water quality. Requirements to avoid or minimize discharge of waste would be the least stringent for Tier 1 fields and the most stringent for Tier 3 fields"). CSPA agrees that a tiering system is important to controlling the costs of implementing and overseeing the program and assuring that limited resources are aimed at potentially significant pollution dischargers. CSPA believes that the three tiers proposed in the PEIR for both surface and groundwater make sense in providing some initial guidance on the selection and implementation of BMPs. However, CSPA believes both Tier 2 and 3 should conduct similar levels of farm-specific water quality monitoring, albeit not as extensive as that proposed for Alternative 5 and, at least theoretically, for Alternative 4. In addition, CSPA also would use the information gleaned from the ambient monitoring and water quality management plans to further prioritize the farms that must conduct effluent water quality monitoring.

Alternative 4's monitoring requirements for both Tier 2 and 3 dischargers fail to implement Resolution 68-16, evaluate management practice effectiveness and assure compliance with water quality standards by allowing regional monitoring by discharger coalitions to replace the outlined farm-specific monitoring. *See* PEIR, p. 3-19. The inclusion of farm specific monitoring is an illusion as every discharger obviously will opt for the cheaper monitoring far away from their activities and effluent. Monitoring required by the ILRP should be focused on effluent monitoring and BMP effectiveness.

Likewise, for groundwater monitoring the Alternative should focus on onsite wells and leave the regional monitoring to the Regional Board and its consultants. Regional monitoring could also be supplemented by use of the California Department of Public Health public drinking water supply database. Use of the database, in selecting for pesticide and nitrate concentrations in Central Valley wells, would allow for an analysis of the effectiveness of the Alternative as implemented. CSPA believes the monitoring of existing wells is a reasonable proposal and should be implemented by both Tier 2 and 3 groundwater dischargers. Most farms will have one or more functional wells already in place. It is a simple step to require nutrient and pathogen monitoring of those existing wells. The data also would be much more relevant (though perhaps initially not sufficient to define the scope of any water quality exceedances) to that particular discharger. Any regional groundwater problem would simply measure in that locale and say little if anything about dischargers several miles away.

The proposed monitoring frequency for Tier 2 dischargers of once every five years is also woefully inadequate, whether considered on a farm-specific or regional basis. It is already difficult enough to make determinations about compliance with standards or implementation of BPTC based on edge of field monitoring four times in a single year. To then wait five more years before the next set of samples would prevent

any determination of trends and any improvements to BMPs for that amount of time or longer. Sampling needs to occur every year, whether a discharger is in Tier 2 or Tier 3.

Although not ideal, CSPA believes the proposed number of sampling events in any given year strikes a proper balance. PEIR, p. 3-24 ("Tailwater discharges during the first discharge of the irrigation season and once mid-season. Storm water discharges during the first event of the wet season (between October 1 and May 31) and once during the peak storm season (typically February). Discharges of subsurface (tile) drainage systems annually"). CSPA incorporates this proposal into its preferred alternative.

Alternative 4 again discloses staff's penchant for encouraging the formation of intermediate bureaucracies and entities over whom they have no enforcement authority by inviting groups of dischargers to form "legal entities that could serve a group of growers who discharge to the same general location and share monitoring locations." PEIR, p. 3-20. CSPA agrees that there exist opportunities for neighboring farms to work together to monitor shared irrigation ditches and implement joint control measures. CSPA does not see any reason for the individual dischargers to have to form a separate entity to accomplish this goal. Each of them could incorporate the measure into their respective FWQMPs and each would simply be jointly and severally responsible for its implementation and effectiveness. The Regional Board could respond to one or all, though obviously any inspection and follow-up would want to be with all of the cooperating farms.

5. Alternative 5's aggressive agency reviews and approvals and expensive monitoring proposals go beyond the reasonable next step but it is the one alternative reviewed in the PEIR that, if implemented would dramatically reduce irrigated lands pollution discharges.

Of the five alternatives described in the PEIR, Alternative 5 is the only one that proposes an effective framework that (1) would comply with Resolution 68-16's requirement that each discharger demonstrate BPTC and prevent degradation, (2) assure the attainment of water quality standards not only miles downstream but in the immediate area of a discharger's effluent, and (3) provide information sufficient for the Regional Board staff to properly prioritize its inspections and enforcement. Alternative 5 is modeled on the successful industrial and construction site storm water permit programs, with a few important exceptions. Unfortunately, in their apparent excitement, the PEIR drafters could not refrain themselves from layering in too many requirements the sole purpose of which appears to be to make the alternative so expensive that it would never be selected. CSPA believes that, although the regulatory framework of Alternative 5 is sound, the monitoring frequency and constituents (at least as defined in the accompanying economic analysis) are excessive and the absence of any tiering that would prioritize the riskier dischargers also misses a reasonable method of reducing costs.

Alternative 5 proposes monitoring that goes well beyond, for example, the storm water general permits' focus on basic parameters and representative metals monitoring. Technical Memo, pp. 2-17 – 2-19. *See* Kings River Coalition Annual Monitoring Report (2010) (according to the Technical Memo, the monitoring constituents are based on the regional samples taken by the Kings River Coalition). This is overkill for site specific monitoring. The frequency of monitoring also is dramatically increased in this Alternative for tailwater discharges. For example, Alternative 5 would require monthly sampling of tailwater as compared to Alternative 4's proposal of twice per irrigation season (albeit with its regional monitoring exception). CSPA believes the extensive and costly monitoring parameters proposed for Alternative 5 go well beyond what is necessary for the Board and a discharger to determine whether they have installed BPTC and are protecting water quality objectives.

The most obvious poison pill in Alternative 5 is the proposal that every farmer drill and install groundwater monitoring wells. Focusing on existing wells would be much more reasonable. Additionally, use of the California Department of Public Health public drinking water supply database would allow for an analysis of the effectiveness of Alternative 5 as implemented. The database could be queried for pesticide and nitrate concentrations in wells in the Central Valley to determine of concentrations are increasing or decreasing. The database could also be used for analysis to determine the role of the Alternative in contributing to trends (*i.e.* what role the Alternative plays in increases or decreases).

As for the FWQMPs, CSPA does not believe there is any basis for allowing dischargers two-years to prepare and implement FWQMPs. PEIR, p. 3-27. They have been on notice for the last seven years that they need to implement management measures. In many areas, management plans that supposedly will not lead to implementation of BMPs have been in place for some time. CSPA believes that all dischargers should prepare and implement FWQMPs within 6 months.

Alternative 5 does drop the proposal to have the Regional Board coordinate with dischargers regarding their FWQMPs and review and approve each plan as well. CSPA believes this is a reasonable omission. However, the FWQMPs need to be submitted to the Regional Board, ideally as pdfs that could be posted on-line. The proposal to have them on-site and available upon the Regional Board's request would eliminate their utility for staff to rely upon them to make decisions about enforcement priorities, undercuts the public's ability to review FWQMPs, precludes other dischargers from reviewing similar dischargers' plans, and sends a message to dischargers that they need not worry until the Board shows up.

Alternative 5 states that Board staff will "[f]ollow up and coordinate with growers to ensure that FWQMPs and implemented management practices are addressing identified water quality problems." PEIR, p. 3-26. The economic analysis presumes that by merely interacting directly with growers, Board staff will have to provide them

technical assistance on their FWQMPs. *See* Technical Memo, p. 2-24 ("Board staff will be required to interact directly with growers and provide technical assistance when requested"). In so presuming, the economic analysis comes up with an estimated staffing level of 356 staff. *Id*. This number completely exaggerates the level of staff necessary to implement this alternative. Indeed, the industrial and construction storm water program covers more than 7,500 facilities throughout the Central Valley. Currently, the Regional Board assigns fewer than a dozen staff to implement and enforce that entire program, which also includes overseeing the 93 Phase I and II municipal stormwater permits. More staff is clearly necessary to more effectively implement that program. Even with those few staff however, it is clear that almost all of the 7,500 facilities have implemented some level of management measures.

Alternative 5 itself does not suggest that Board staff are obliged to act as dischargers' consultants. That notion, expressed in the economic analysis, is entirely improper. Any follow-up by staff should be pursuant to its oversight and enforcement authority. The Regional Board need not add 356 staff to effectively implement this alternative. As CSPA also proposed for Alternatives 3 and 4, the Board should focus its limited resources by using the monitoring data and FWQMPs to prioritize site inspections and distribute the results – providing examples of good compliance and issuing enforcement orders and penalties where compliance falls short.

6. The PEIR fails to consider the true no project alternative – automatic termination of the waiver and implementation of individual WDRs

The PEIR's formulation of the no project alternative is wrong because the PEIR incorrectly treats the existing general waivers as continuing in perpetuity. PEIR, p. 3-4 ("no project alternative" identified as <u>future</u> renewal of existing program and continued implementation) (emphasis added). The PEIR claims that a future extension or renewal of the existing waiver is of a "ministerial nature." *Id*. Both of these assertions are incorrect as a matter of law. If the Board takes no action, the existing waiver terminates on June 30, 2011. Order No. R5-2006-0053, p. 17; Water Code § 13269(a)(2). Any renewal of the existing waiver is not ministerial but discretionary, requiring the Regional Board to hold a hearing and exercise its discretion to determine whether renewing an existing waiver complies with the Basin plan, is in the public interest and includes adequate monitoring. Water Code §§ 13269(a)(2), (f). Hence, the no project alternative is allowing the existing waiver to automatically terminate on June 30, 2011 and what would reasonably be expected to occur once that happens.

The PEIR cites out-of-context a single sentence from the CEQA Guidelines relating to revising a regulatory plan. The PEIR quotes the following sentence from CEQA Guideline § 15126.6(e)(3)(A) – "When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the 'No Project' Alternative will be the continuation of the existing plan, policy, or operation into the future." PEIR, p. 1-3. The PEIR suggests that guidance allows the Regional Board to make believe that

doing nothing somehow magically renews the existing waivers come June 20, 2011. That, of course, is not a "no action" or "no project" alternative. Renewing the waivers would be selecting a discretionary action.

CEQA requires that an EIR consider a no project alternative. CEQA Guidelines § 15126.6(e)(1) ("The specific alternative of "no project" shall also be evaluated along with its impact"). "The purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." *Id*. "The "no project" analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. CEQA Guidelines § 15126.6(e)(2). "The [no project] description must be straightforward and intelligible, assisting the decision maker and the public in ascertaining the environmental consequences <u>of doing nothing</u>; requiring the reader to painstakingly ferret out the information from the reports is not enough." *Planning & Conservation league v. Dept. of Water Resources* (2000) 83 Cal.App.4th 892, 911 (emphasis added).

The Guidelines note that "[a] discussion of the "no project" alternative will usually proceed along one of two lines . . . CEQA Guidelines § 15126.6(e)(3). The PEIR attempts to rely on the first category, which states in full that:

> When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the "no project" alternative will be the continuation of the existing plan, policy or operation into the future. <u>Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed</u>. Thus, the projected impacts of the proposed plan or alternative plans would be compared to the impacts that would occur under the existing plan.

CEQA Guidelines § 15126.6(e)(3)(A) (emphasis added). However, the existing waiver, unlike a typical land use or general plan (or for example the Regional Board's Basin Plan) that does not expire by a date certain, expires as a matter of law on a date certain, June 30, 2011. The Guidelines make clear that the Regional Board cannot treat one of its alternatives to a proposed project (assuming the PEIR included a proposed project) as a no project alternative:

> After defining the no project alternative . . ., the lead agency should proceed to analyze the impacts of the no project alternative by projecting what would reasonably be expected to occur in the foreseeable future <u>if the project were not approved</u>, based on current plans and consistent with available infrastructure and community services.

CEQA Guidelines § 15126.6(e)(3)(C). The current relevant plans germane to the PEIR are the existing waivers. If the Regional Board were to do nothing by June 30, 2011, *i.e.*, a true no project alternative, the waivers will automatically expire. The Board cannot assume it will select one of the project's alternatives and pretend it is not approving the project. This methodology was firmly rejected by the Court in *Planning & Conservation League*:

> A no project description is nonevaluative. It provides the decision makers and the public with specific information about the environment if the project is not approved. It is a factually based forecast of the environmental impacts of preserving the status quo. It thus provides the decision makers with a base line against which they can measure the environmental advantages and disadvantages of the project and alternatives to the project. By contrast, the discussion of alternatives is evaluative.

Planning & Conservation League, 83 Cal.App.4th at 917-918. The PEIR fails to project out an actual no project alternative, incorporating the reality that the existing waivers are temporary with only 10 months to live.

The PEIR's assertion that the existing waivers can be ministerially extended or renewed is blatantly incorrect. *See* PEIR, p. 3-29 ("If the Central Valley Water Board fails to take the ministerial action to extend or renew the waiver program, regulation of irrigated agriculture would not cease"); *id*., p. 1-3 ("Given the ministerial nature of the extension or renewal of the ongoing waiver, which would allow continuation of the existing program, Alternative 1 is best characterized as the "No Project" Alternative"). Pursuant to Water Code § 13269, the Regional Board must apply its discretion to adopt or renew a conditional waiver. Water Code §§ 13269(a)(2), (f). *See* CEQA Guidelines §§ 15002(i)(2) ("[w]hether an agency has discretionary or ministerial controls over a project depends on the authority granted by the law providing the controls over the activity"). The initial decision as to whether to renew a waiver or adopt waste discharge requirements or a prohibition are highly discretionary. Assuming the Regional Board chooses to pursue issuance of a conditional waiver, the Regional Board wields considerable discretion in adopting the necessary conditions of the waiver. The Regional Board must employ its discretion to make the fundamental determinations that the conditional waiver will be consistent with the Basin Plan and in the public interest. Lastly, Section 13269 precludes the Regional Board from renewing any waiver without holding a public hearing where it must review the terms of the waiver.

Porter-Cologne's waiver renewal process cannot be equated even remotely with a ministerial action. "'Ministerial' describes a governmental decision involving little or no personal judgment by the public official as to the wisdom or manner of carrying out the project. The public official merely applies the law to the facts as presented but uses no special discretion or judgment in reaching a decision." CEQA Guidelines, 14 CCR § 15369. "A ministerial decision involves only the use of fixed standards or objective

measurements, and the public official cannot use personal, subjective judgment in deciding whether or how the project should be carried out." *Id*. As we are all well aware, having gone through this waiver process several times now, the decisions to be made by the regional Board are loaded with subjective, personal judgment. *See* CEQA Guidelines § 15357 ("'Discretionary project' means a project which requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations"); § 15002(i) ("[a] project subject to . . . judgmental controls is called a 'discretionary project'"). *See also* CEQA Guidelines § 15268(d) ("Where a project involves an approval that contains elements of both a ministerial action and a discretionary action, the project will be deemed to be discretionary and will be subject to the requirements of CEQA").

The PEIR must be revised and recirculated with a properly defined and evaluated no project alternative.

H. The PEIR Ignored CSPA's and Others Scoping Comments.

As the PEIR recognizes, "[i]n accordance with State CEQA Guidelines Section 15123(b)(2), the areas of controversy known to the lead agency, including issues raised by agencies and the public, shall be identified in the EIR." PEIR, p. 1-8. *See* CEQA Guidelines § 15123 ("(a) An EIR shall contain a brief summary of the proposed actions and its consequences. . . . (b) The summary shall identify: . . . (2) Areas of controversy known to the lead agency including issues raised by agencies and the public. . .).

CSPA and others have participated in the development of the EIR from its inception, submitting detailed scoping comments that fully advised the Regional Board of CSPA's long-standing criticisms of the existing ILRP and the need for FWQMPs, farm-specific monitoring and compliance with antidegradation requirements. *See* CSPA/Baykeeper Scoping Comments (May 30, 2008); CSPA et al. Scoping Comments (March 12, 2003). In those comments, CSPA emphasized the main controversies surrounding the ILRP – embellished further by these PEIR comments – that the ILRP and EIR "must directly address and eliminate . . . violations of water quality standards in light of the fact that, under the present program, the Regional Board cannot know who is actually discharging pollutants, what specific pollutants are being discharged, what are the localized water quality impacts in the vicinity of the discharge, who has or has not implemented best management practices (BMPs) and whether any reductions in pollutant loading or improvements in water quality have occurred." CSPA/Baykeeper Scoping, p. 3 (May 30, 2008). CSPA also reiterated the ongoing controversy "that Reports of Waste Discharge and individual farm-based management plans (similar to pollution prevention plans under the industrial or construction stormwater permits) are fundamentally necessary for any meaningful program addressing discharges from irrigated lands." *Id*., p. 4. The scoping comments also highlighted the ongoing controversy that the ILRP, to be successful and comply with Resolution No. 68-16, must

include farm specific water quality monitoring. *See id*., p. 2 ("[EIR] cannot rely on information collected far downstream to adequately address and mitigate upstream adverse impacts to sensitive biological resources, *i.e.*, it must identify localized impacts in the vicinity of actual discharge locations"). Many of these same issues have been raised by CSPA and others in their comments on the previous waivers as well, debated by the Regional and State Boards, and been the subject of previous litigation. *See, e.g.* CSPA et al. Comments (May 23, 2003); Deltakeeper et al. Comments (November 4, 2005).

Despite these well-known areas of controversy, the PEIR fails to include them in the summary as required by CEQA. This blatant omission underscores the bias built-into the PEIR and ultimately informing staff's separate recommendation in its staff report. Indeed, the few controversies listed in the summary are for the most part restricted to those articulated by the coalitions. PEIR, p. 2-9. The PEIR's summary needs to be rewritten to comply with the CEQA Guidelines.

I. The PEIR Overlooks a Number of Important Significant Impacts.

The PEIR opts not to discuss any impacts on at least three issue categories – recreation, aesthetics, public health and cultural impacts – which common sense would indicate will be adversely affected by the Regional Board's selection of an ILRP that is ineffective and fails to significantly reduce pollution discharges from irrigated lands. PEIR, p. 1-8. Since the EIR fails entirely to analyze the impact of the alternatives on these issues, these impacts are subject to the fair argument, rather than the substantial evidence standard. Fair argument standard applies even to EIRs if the EIR fails entirely to analyze a particular impact. *Bakersfield Citizens For Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1208.

Under the "fair argument" standard, an EIR must analyze an impact if *any* substantial evidence in the record indicates that a project may have an adverse environmental effect – even if contrary evidence exists to support the agency's decision. CEQA Guidelines § 15064(f)(1); *Pocket Protectors*, 124 Cal.App.4th at 931; *Stanislaus Audubon v. Stanislaus* (1995) 33 Cal.App.4th 144, 150-151 (1995); *Quail Botanical Gardens Found., Inc. v. City of Encinitas* (1994) 29 Cal. App. 4th 1597, 1602. The "fair argument" standard creates a "low threshold" favoring environmental review through analysis in an EIR. *Pocket Protectors*, 124 Cal.App.4th at 928.

1. The PEIR fails to address impacts to Recreation and Aesthetics.

In its scoping comments, CSPA pointed out the need to evaluate the ILRP's alternatives on recreational uses in the Central Valley. *See* CSPA et al. Scoping Comments (March 12, 2003) (EIR should analyze impacts on "recreational, tourism and beneficial uses"). There is clearly a "fair argument" that any version of the ILRP may have significant impacts on both recreation and aesthetics in the Central Valley,

especially within the Delta. By authorizing irrigated lands discharges without FWQMPs or "edge-of-field" effluent quality monitoring, any new ILRP could further exacerbate pollution discharges from irrigated lands. Discharges of both nutrients and pesticides likely would have adverse affects on recreational and aesthetics by continuing to support the growth of nuisance aquatic species, including for example water hyacinth. The growth of water hyacinth in turn results in further water quality impacts to the Delta, including depressed dissolved oxygen levels, increased herbicide spraying, including toxic surfactants, and other pollution concerns. None of these potential impacts were discussed in the PEIR. *See* PEIR, p. 5-11-2 ("It is not anticipated that the program alternatives would substantially increase or decrease the use of recreational facilities, create the need for such facilities, or result in any other foreseeable significant impact on recreational opportunities in the program area"); p. 5.11-1 (no review of impacts to aesthetics).

Discharges of nutrients from farms contribute to the explosive growth of water hyacinth (*Eichhornia* crassipes) and Brazilian elodea (*Egeria densa*) in the Sacramento-San Joaquin River Delta. Both Brazilian elodea *Egeria densa* and water hyacinth *Eichhornia crassipes* "form dense growths that block waterways and destroy natural habitat by slowing water flow and drastically changing water quality. http://www.dbw.ca.gov/PDF/Egeria/WHSciProbsExcerpts.pdf. As the San Francisco Estuary Institute reports, "[d]ense contiguous mats" of water hyacinth "create navigation and safety concerns in waterways, harbors, and marinas." http://legacy.sfei.org/nis/hyacinth.html. Hyacinths "[i]nterfere[] with irrigation and power generation by clogging pumps and siphons." *Id*. Hyacinth "[c]an completely exclude native floating and submerged vegetation, shade habitat, change water temperature [and] … deplete dissolved oxygen." *Id*. As Dr. G. Fred Lee has summarized,

> Delta waters experience excessive growths of aquatic plants such as water hyacinth and *Egeria densa*. These water weeds interfere with recreational use of Delta waters for boating, swimming, water skiing, fishing, etc. The water weeds develop on nutrients added to Delta tributaries from urban, agricultural and wetlands sources in the Delta watershed, and from Delta island discharges. The California Department of Boating and Waterways spends several hundred thousand dollars per year to apply chemicals for controlling water weeds. There is concern about the potential toxic and other impacts of these chemicals on non-target organisms, such as fish food organisms, in the water column and sediments.

Lee, G. Fred and Anne Jones Lee, "Overview of Sacramento-San Joaquin River Delta Water Quality Issues," p. v (June 24, 2004). Because of the significant contribution of nutrients from irrigated lands, there is plainly a fair argument that the Regional Board's authorization of irrigated lands discharges may have a significant impact on recreational boaters and persons recreating in the Delta and observing vast areas of water hyacinth.

Because of the navigational, recreational and aesthetic impacts resulting from excessive water hyacinth growth, the State of California expends resources every year spraying herbicides into Delta waterways. *See* Lee, p. 19 ("large amounts of aquatic herbicides are used in the Delta to control excessive growths of water hyacinth this could be an important issue impacting Delta water quality"). *See* Dept. of Fish & Game, "Acute Toxicities of Herbicides Used to Control Water Hyacinth and Brazilian Elodea on Larval Delta Smelt and Sacramento Splittail (June 8, 2004).

In addition to increasing herbicide discharges to the Delta, water hyacinths also provide habitat for other nonnative crabs and parasites, which ultimately may affect endangered salmon in the Central Valley. As one recent study reports,

> [t]he newfound presence of these crustaceans could have significant ramifications apart from just adding their names to the already lengthy list of non-indigenous species in the Delta. Amphipods and isopods are known to be intermediate hosts of a number of parasites, including acanthocephalan parasites of fish (Nagasawa et al. 1983, Yasumoto and Nagasawa 1996). *Asellus hilgendorfii* has specifically been shown to serve as an intermediate host for numerous species of acanthocephalans that parasitize salmonids and other fish in waters of Japan (Nagasawa and Egusa 1981, Nagasawa et al. 1983, Mayama 1989). Infection occurs when fish prey upon *A. hilgendorfii* that contain acanthocephalan larvae. Adult acanthocephalans parasitize the intestinal tract of the definitive host fish (Nagasawa et al. 1983). Studies have shown that salmonids can have infection levels of 83-100% depending on the season, when *A. hilgendorfii* is only 2.1 % of the total wet weight of food items in the fish diet (Nagasawa et al. 1983). Thus, even though *A. hilgendorfii* occurs in low abundance in the diets of fish in the Sacramento/San Joaquin Delta, it could still potentially infect the entire population of salmonids with acanthocephalan parasites."

Toft, Jason David, "Community Effects of the Non-Indigenous Aquatic Plant Water Hyacinth (*Eichhornia crassipes*) in the Sacramento/San Joaquin Delta, California" (2000). All of these direct and indirect effects must be discussed and analyzed in the PEIR.

In addition, the presence of bacteria in samples collected by the existing ILRP obviates the need to address the affect of PEIR's alternatives and their ability to reduce fecal discharges on recreation, especially swimming, and human health. In CSPA's experience, it is not possible to keep kids from playing in water. As the staff report summarizes:

> The fecal pathogen indicator *E. coli* is the most common parameter with surface water exceedances of water quality objectives in the ILRP; it was detected in 99 percent of all samples. Fecal contamination is a concern

> because certain pathogenic bacteria found in feces can cause gastrointestinal illness.

Staff Report, p. 33. Indeed, 24 and 55 management plans in the Sacramento River and San Joaquin, respectively, have been triggered because of exceedances of E. coli standards in those rivers. Staff Report, p. 26, Table 3. The PEIR makes a passing reference to the fecal coliform problem, noting that "[t]oxicity, and bacteria are also known water quality problems in the Sacrament River Basin." PEIR, p. 5.9-6. The obvious impacts of fecal coliform discharges on recreational uses like swimming and boating in the Delta and other waters of the Central Valley must be addressed in the PEIR.

Lastly, CSPA is aware of numerous individuals who once recreated in and on the Delta and other Central Valley waters who have stopped or reduced such recreation because of fears of contaminants and experiencing health effects that were associated with exposure to Central Valley waters. For example, one of CSPA's members, Linda Forbes, reports:

> I was a frequent visitor to the Delta region for five years, enjoying water skiing, camping, boating and swimming. I experienced several strange skin rashes after weekends of recreation at the Delta, with the severity increasing over time. Two summers ago I began to feel more and more uncomfortable about the risks of pursuing my water sports passion there; I have not gone swimming or skiing in Delta waters for over a year.

E-mail from Linda Forbes to Bill Jennings, CSPA (Sept. 23, 2010). Another example is from Barbara Barrigan-Parrilla, a CSPA member and the Director of Restore the Delta. She tells of her daughter's first swim in the Delta as an infant resulting in an emergency room visit and her refusal to swim in the Delta since that day. E-mail from Barbara Barrigan-Parrilla to Bill Jennings, CSPA (Sept. 25, 2010). Kari Burr, a fisheries biologist, also describes the adverse impacts of agricultural discharges on her professional and recreational activities. E-mail from Kari Burr to Bill Jennings, CSPA (Sept. 26, 2010). *See also* E-mail from Frank T. Rauzi to Bill Jennings (Sept. 26, 2010) (Mr. Rauzi, a lifelong resident and fisherman of the Delta, recounts his refusal to eat fish and concerns about swimming in the Delta). Based on conversations between Bill Jennings and other CSPA members over the years, CSPA does not believe Ms. Forbes,' Ms. Barrigan-Parilla's, Ms. Burr's or Mr. Rauzi's experiences are isolated incidents but unfortunately are shared by numerous people who would recreate in waters of the Central Valley but for the incredible levels of toxic and health-threatening pollution that is discharged from irrigated lands.

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2. PEIR fails to analyze cultural impacts re: traditional uses of salmon or other fish.

The PEIR opts not to evaluate any cultural impacts of the various ILRP alternatives. PEIR, p. 5.3-9. Contaminants affecting Central Valley salmon and contributing to their decline have adverse impacts on Native American culture and religious practices. It is widely acknowledged by scientists and government agencies that agricultural runoff is one of the factors adversely affecting Chinook salmon. *See* PEIR, p. 5.8-22 ("Other factors affecting the fall-run/late fall–run Chinook salmon include . . . pollution (*e.g.*, municipal discharges and agricultural runoff), ... (Moyle et al. 2008:141–143)"). *Id*. at 5.8-39 ("NMFS (2008) concluded that EPA registration of chlorpyrifos, diazinon, and malathion would jeopardize the continued existence of, and destroy or adversely modify critical habitat for, the Central Valley spring-run Chinook salmon ESU, the Sacramento River winter-run Chinook salmon ESU, and the California Central Valley steelhead DPS"); National Academy of Sciences, "A Scientific Assessment of Alternatives for Reducing Water Management Effects on Threatened and Endangered Fishes in California's Bay–Delta," p. 42 (2010) ("It has long been recognized that contaminants are present in the delta, have had impacts on the fishes, and may be increasing (Linville et al., 2002; Davis et al., 2003; Edmunds et al., 1999).

Native American traditional uses and religious ceremonies involving salmon continue on the Sacramento River and, to a lesser degree, the San Joaquin River, and their tributaries. As the United States District Court for the Eastern District of California recently ruled, "salmon have sustained the Winnemem Wintu and have formed the foundation of the Tribe's cultural and spiritual ceremonies and beliefs." Order, p. 88. (May 18, 2010). Judge Wanger specifically recognized the "significant cultural and spiritual interests of the Winnemem Wintu" tied to the health of salmon. *Id*., pp. 88-89. The District Court relied upon the declaration of Gary Hayward Slaughter Mulcahy, the Governmental Liaison and a Tribe member of the Winnemem Wintu Tribe. As Mr. Mulcahy testified to the Court,

> For centuries, the Winnemem Wintu have had a deep cultural and spiritual relationship with the salmon that utilize the Sacramento River and its tributaries. We sing to the salmon and the waters that sustain them. Our history, traditions, ceremonies, and culture are filled with respect, reverence, appreciation, and dependence on the salmon and these waters. Salmon were the staple of the Winnemem Wintu. Salmon are the food necessary to complete and fulfill many of the Winnemen Wintu's very special sacred ceremonies. Salmon are the sustainer of health and life of the Winnemem Wintu. We believe that when the first spirits were choosing what form they would take (i.e., Salmon, Eagle, Bear, Human, etc.), when Human chose to be human, the Grandfather spirit said that these Humans will need lots of help, and each of the other spirits gave something to Humans to help them through life. We believe that Salmon gave us speech and in return we promised to always speak for them. This

> is remembered and celebrated in ceremonies on the McCloud River, Sacramento River, Squaw Creek and at Mt. Shasta several times a year. We believe that if the salmon go, the Winnemem Wintu will also disappear.

Declaration of Gary Hayward Slaughter Mulcahy, ¶ 3 (March 12, 2010). The Tsi-Akim Maidu Tribe conducts a "calling back the salmon" ceremony on the Yuba River. http://www.callingbackthesalmon.com/ceremony.php. The PEIR must gather in and discuss relevant information regarding Native American cultural and religious uses of salmon that may be affected by the Regional Board's proposal to authorize contaminants affecting salmon in the Central Valley.

3. The PEIR fails to address public health impacts of authorizing continued discharges of pesticides and other pollutants from irrigated lands effluent to groundwater.

As early as March 2003, CSPA and others urged the Regional Board to consider human health impacts of authorizing irrigated land discharges in its EIR. CSPA et al. Scoping Comments (March 12, 2003) (EIR must consider "human health throughout the Central Valley and California in terms of both acute and chronic impacts including, but not limited to: - children, including residents and school children - laborers, including farmworkers, farmers, pesticide appliers, etc. – residents – anglers - pregnant women - newborn infants"). Despite that request, the PEIR has opted to ignore potential human health impacts of the various ILRP alternatives approval of continuing irrigated land discharges.

More than two million Californians have been exposed to harmful levels of nitrates in drinking water over the past 15 years and the population of those exposed keeps growing. The PEIR acknowledges the extent of nitrate contamination and includes, as Figure 5.9-17, a map that shows nitrate contamination to be concentrated in the Central Valley. Incredibly, however, the PEIR makes no attempt to analyze how nitrogen-based fertilizer application in the Central Valley results in the exposure of the public to contaminated groundwater, the health impacts of that exposure, or how implementation of any of the five alternatives would reduce exposure, other than to say, for Alternative 1:

> Nutrient management would improve both surface water quality and groundwater quality by improving the use of chemicals and using improved application techniques, and by limiting the use of nutrients as fertilizer that could potentially seep to groundwater and add nitrate to the groundwater table.

PEIR, p. 5.9-14.

The assertion that ongoing nutrient management efforts would somehow improve water quality is not borne out by recent data. In fact, the status quo, as proposed in Alternative 1, has resulted in an increase, statewide, in the number of wells that exceeded the health limit for nitrates, from nine in 1980 to 648 by 2007. http://articles.sfgate.com/2010-05-17/news/20901575_1_nitrate-contamination-water-supply-water-systems. In Tulare County, more than 40% of private domestic water wells exceed the drinking water standard for nitrate. http://www.swrcb.ca.gov/ gama/docs/ekdahl_gra2009.pdf. On the basis of more than 25 years of data, the number of wells that exceed the drinking water standard for nitrate is growing as a percentage of all nitrate detections. http://www.swrcb.ca.gov/gama/docs/ekdahl_gra2009.pdf Clearly the status quo is not working.

Health effects of exposure to nitrates most notably results in methemoglobinemia or "blue baby syndrome." Toxic effects of methemoglobinemia occur when bacteria in the infant stomach convert nitrate to more toxic nitrite, a process that interferes with the body's ability to carry oxygen to body tissues. Infants with these symptoms need immediate medical care since the condition can lead to coma and eventually death. Pregnant women are susceptible to methemoglobinemia and should be sure that the nitrate concentrations in their drinking water are at safe levels. Additionally, some scientific studies suggest a linkage between high nitrate levels in drinking water with birth defects and certain types of cancer. http://www.swrcb.ca.gov/water_issues/ programs/gama/docs/coc_nitrate.pdf.

The PEIR should be rewritten to include an assessment of the potential for the public to be exposed to nitrates in drinking water from agricultural practices in the Central Valley and measures implemented as a result of the ILRP. This is especially important to the extent the Regional Board anticipates the installation of numerous tailwater recovery systems. *See* Technical Memo, p. A-2. The assessment of each alternative should include an estimate of nitrogen loading to fields; nitrogen fate and transport in soil, surface water, and groundwater; nitrogen monitoring; and a summary nitrogen impacts to water supplies. Linking monitoring to measurement of each of the alternatives is critical. An annual assessment of the performance of the alternative that is selected should be required and use of the 10,000-well California Department of Public Health database should be required as a tool for evaluation.

Another potential health impact unaddressed by the PEIR is the potential threats from fecal contamination of wells and surface waters. As the Existing Conditions Report tells us:

> The presence of pathogen indicators, such as fecal coliform and *E. coli*, are ubiquitous in water samples collected throughout the Central Valley and are frequently measured at levels higher than the EPA recommended criterion for *E. coli*. Not all strains of *E. coli* are pathogenic, but the presence of *E. coli* or fecal coliform is an indicator of fecal contamination.

> Several coalitions funded a study to determine the sources of *E. coli* contamination.

Existing Conditions Report, p. 3-11. See also U.S. EPA, "Conceptual Model For Pathogens and Pathogen Indicators in The Central Valley and Sacramento-San Joaquin Delta - Final Report, " p. ES-1 (Aug. 24, 2007) (highest concentrations of E. coli data "were observed for waters affected by urban environments and intensive agriculture in the San Joaquin Valley") (http://www.swrcb.ca.gov/rwqcb5/water_issues/drinking_water_policy/concept_path_indicators/cover_toc_es.pdf). As the California Department of Public Health's health notices explain:

> Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

DPH, Tier 1 Fecal Coliform or E. coli Notice Template (http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Notices/Tier%201%20Fecal%20Coliform%20or%20E%20coli%20Notice.doc). Despite its ubiquitous presence and clear connection to irrigated land discharges, the only mention of pathogens in the PEIR is a passing reference in the Fisheries section. PEIR, p. 5.8-49 ("Pathogens are monitored for potential exceedance of trigger limits in relation to human health. Pathogens of concern to fish may affect fish populations in the program area, but data are insufficient to draw any conclusions about existing effects"). Like nitrates, no effort is made in the PEIR to discuss the obvious human health and recreational impacts that are adversely affected by an ILRP that authorizes coliform discharges from farms.

Lastly, the PEIR fails to consider any human health impacts PEIR associated with discharges of other pollutants, including certain metals, that will be authorized through the ILRP. The Existing Conditions Report acknowledges that irrigated land discharges authorized by the ILRP will mobilize various metals that can pose serious human health risks, including lead and arsenic. Existing Conditions Report, p. 3-55 ("elevated levels of naturally occurring metals that are mobilized and suspended in agricultural return flows are common in these watersheds—such as copper, arsenic, cadmium, boron, nickel, lead, and selenium"). The PEIR also should explore the human health impacts of ILRP-authorized discharges of metals.

J. PEIR's Analysis of Many Key Potential Impacts and the Alternatives' Proposed Mitigations Are Not Supported by Substantial Evidence.

The alternatives, at their core, are projects by which the Regional Board proposes to authorize discharges of polluted effluent from irrigated lands to surface and

groundwater throughout the Central Valley. Each alternative includes various program elements which are the mitigations proposed to purportedly reduce the effect of the Regional Board authorizing the discharge of hundreds of millions of gallons of polluted effluent. The PEIR's discussion of impacts boils down to a discussion of the alternatives' proposed mitigation measures. In addition to those proposed mitigations, the actual dischargers would have to implement site-specific mitigation measures, *i.e.* BPTC, in order to address the impacts of discharging to the State's waters.

The PEIR fails to substantiate or properly analyze the alternatives' programmatic-level mitigation measures, including for example the effectiveness of any FWQMPs and reporting requirements, monitoring requirements, and third party actions. Nor does the PEIR adequately discuss the effectiveness in reducing pollution of any of the BMPs that are listed and which might achieve BPTC. The PEIR leaves out any discussion of numerous management measures that likely will be applied on irrigated lands. Lastly, the PEIR fails to analyze cumulative impacts of the alternatives when considered with numerous other projects in the Central Valley relating to water diversions, dam operations, proposed development, pending pesticide registration proceedings, dredging projects and others that are and will affect water quality, fisheries, and other impacts.

Mitigation measures must be designed to minimize, reduce or avoid an identified environmental impact or to rectify or compensate for that impact. CEQA Guidelines § 15370. Mitigations may be proposed as part of the project but must still be fully discussed and analyzed. "The discussion of mitigation measures shall distinguish between the measures which are proposed by project proponents to be included in the project and other measures proposed by the lead, responsible or trustee agency or other persons which are not included but the lead agency determines could reasonably be expected to reduce adverse impacts if required as conditions of approving the project." CEQA Guidelines § 151126.4(a)(1)(A)

Where several mitigation measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified. *Id.*, § 15126.4(a)(1)(B). A lead agency may not make the required CEQA findings unless the administrative record clearly shows that all uncertainties regarding the mitigation of significant environmental impacts have been resolved. A public agency may not rely on mitigation measures of uncertain efficacy or feasibility. *Kings County Farm Bureau*, 221 Cal.App.3d at 727 (finding groundwater purchase agreement inadequate mitigation measure because no record evidence existed that replacement water was available). "Feasible" means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors. CEQA Guidelines § 15364.

CEQA requires the lead agency to adopt feasible mitigation measures that will substantially lessen or avoid the Project's potentially significant environmental impacts and describe those mitigation measures in the CEQA document. Pub. Res. Code §§ 21002, 21081(a), 21100(b)(3); CEQA Guidelines § 15126.4. Mitigation measures must be fully enforceable through permit conditions, agreements or other legally binding

instruments. *Id.* at § 15126.4(a)(2). If a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed. CEQA Guidelines § 151126.4(a)(1)(D).

1. The analysis of impacts to water quality is flawed because there is no evidentiary support for the assumption that mitigation measures proposed by each alternative would be equally effective.

The most obvious impact of the Regional Board authorizing discharges of waste from irrigated lands to surface or groundwater is impaired water quality. The PEIR, however, takes an entirely cavalier approach to evaluating this obvious impact. No effort is made in the PEIR to discuss the efficacy and uncertainty of the various monitoring and management plans proposed by each alternative. The PEIR makes no effort to quantify or compare the actual pollution reductions that would be likely to occur under each alternative. Nor does the PEIR discuss whether the monitoring proposed or omitted by each alternative would be effective in informing the Regional Board and public about whether irrigated lands pollution in specific areas is increasing or decreasing. Nor does the PEIR compare how long it would take to figure out pollution trends based on the level of monitoring proposed or omitted in each alternative.

As mentioned above, a fundamental flaw in the PEIR is its failure to estimate the relative effectiveness of the five alternatives. It generally assumes that they will all lead to sufficient pollution reductions. This flaw is magnified in the discussion of impacts to water quality. In addressing water quality impacts, the PEIR assumes that surface water quality improvements under Alternative 1 would be the same as all of the other alternatives, including Alternative 5. As for groundwater, the PEIR makes a similar assumption – that Alternatives 2 through 5 will be equally effective at reducing pollution to groundwater (the PEIR does acknowledge that not addressing groundwater at all would be less effective).

Thus, for Alternative 1, the PEIR states that "[i]t is expected that existing water quality conditions, such as the surface water quality impairments detailed in the environmental setting section above and in the ECR, would improve over time as the program would continue to implement surface water management practices and management plans." PEIR, p. 5.9-14. The same is said for Alternatives 2 and 3, even though the former reduces water quality monitoring and the latter eliminates water quality monitoring. *Id*, pp. 5.9-16 ("Under Alternative 2, existing water quality impairments are expected to improve over time as third parties develop and implement surface water and groundwater quality management plans"), 5.9-17 ("Alternative 3, existing surface water quality and groundwater quality impairments are expected to improve over time as the FWQMPs are developed and implemented"). The same unexplained expectation is stated for Alternatives 4 and 5, simply incorporating the assertion made for Alternative 2. Id., p. 5.9-18 (Alternative 4) ("Potential impacts to water quality and hydrology under Alternative 4 would be similar to those described for

Alternative 2"); p. 5.9-18 ("Potential impacts to water quality and hydrology under Alternative 5 would be similar to those described for Alternative 2").

These expectations are unsupported by any evidence in the record. The Regional Board cannot point to anything in its current record that "clearly shows that all uncertainties" of the mitigations set forth in each alternative will eliminate the well-documented significant environmental impacts of allowing irrigated lands to discharge waste to surface and ground water.

The PEIR's simplistic and conclusory assertions fail to assist the Regional Board or the public in discerning the real life differences in pollution discharge rates that the different mitigations incorporated into each of the proposed alternatives will have. For example, in regard to FWQMPs, it is simply not realistic to assume that the two alternatives that do not require FWQMPs – Alternatives 1 and 2 – will be as effective at identifying and implementing measures as the alternatives that do require dischargers to prepare FWQMPs and, at least for two of them, require them to be submitted to the Regional Board. Likewise, for the alternatives that require FWQMPs, there would have to be some difference in effectiveness and pollution reductions between the two alternatives (3 and 4) that would have the Regional Board review and approve FWQMPs and Alternative 5's provision that FWQMPs not be reviewed or approved. Conversely, if the proposal to have the Regional Board approve every FWQMP before they go into effect slows down their implementation, then there would undoubtedly be an impact during the term the Board did not act on any FWQMPs. Until the PEIR can remove the uncertainty of how the Regional Board can assure BPTC is implemented without requiring FWQMPs, the Regional Board may not rely on alternatives that do not propose FWQMPs.

In terms of monitoring, no evidence could support the PEIR's assumption that Alternative 3's omission of any water quality monitoring for surface or groundwater discharges could somehow be as effective as any of the alternatives that do provide some water quality monitoring. And as between Alternative 5's farm-specific monitoring requirement and Alternatives 1, 2 and in effect 4's proposal to rely on regional monitoring, no evidence could support the PEIR's assertion that the regional monitoring measures will tell the Board or anyone whether a particular dischargers' management measures in fact reduce any pollution discharges and would address specific dischargers' pollution problems as promptly as a measure that required them to monitor their discharges. Until the PEIR sufficiently discusses and eliminates the obvious uncertainty of a regional monitoring mitigation measure to evaluate the effectiveness of an on-site management measure miles upstream, the Regional Board cannot rely on alternatives relying on such regional monitoring.

As noted above, the PEIR's assumption that the monitoring required by each of the proposed alternatives is equally effective, is inconsistent with the PEIR's acknowledgment in its discussion of fisheries that more farm-specific monitoring results in more pollution reductions and fewer impacts. PEIR, p. 5.8-52 ("given the probability

of increased monitoring of individual farms, and especially those at higher risk of generating significant impacts—in addition to wellhead protection, nutrient management plans, tracking of nutrient and pesticide application, and monitoring of individual wells—the positive benefit of Impact FISH1 (improved water quality) would probably be greater under Alternative 4 than under Alternative 2 or Alternative 3"); *Id*., p. 5.8-53 (Alternative 5) ("Given the emphasis on monitoring of individual farms, wellhead protection, nutrient management plans, tracking of nutrient and pesticide application, monitoring of individual wells, and potential installation of monitoring wells, the positive benefit of Impact FISH1 (improved water quality) probably would be greater under Alternative 5 than under any other alternative"). Although as discussed below, these analyses also must be better analyzed, the general observation is obvious and the PEIR's failure to discuss these differences in the water quality section renders it inadequate.

Nor is there any attempt in the water quality discussion to quantify the effectiveness of management measures that will likely be employed by individual farms. The PEIR lists a handful of likely measures. This list is incomplete, omitting numerous measures that one can find by reviewing some of the management plans that have been developed. Of particular note is the complete omission in the PEIR of any discussion of integrated pest management options to reduce the use or rate of pesticide applications. Until the Regional Board can sufficiently discuss the available management measures and whether any of them, alone or in combination will effectively eliminate the significant impacts of the Board authorizing waste discharges from irrigated lands, then the Board cannot rely on them.

2. The analysis of impacts to fisheries is flawed because there is no evidentiary support for the assumption that all alternatives would be equally effective at protecting fisheries

The PEIR's handling of impacts to fisheries suffers from flaws similar to those described in the discussion of water quality above. The PEIR's discussion of fisheries impacts, again without any evidence or common sense, simply assumes that the same level of management measures and surface water pollution control effectiveness will result with implementation of any of the alternatives, with or without FWQMPs and without regard to how far away some water quality monitoring may (or may not) be occurring. PEIR, p. 5.8-50 ("Under this alternative, management practices would be implemented to reduce the levels of identified constituents of concern below the baseline conditions. Monitoring and management plan requirements of Alternative 1 are expected to result in further implementation of management practices by growers") As for groundwater, the same is true with the exception of Alternative 1.

The PEIR's assertion that Alternative 1 will improve surface water quality is entirely unsupported by any evidence. Alternative 1, now in its seventh year of implementation, has failed to result in the Regional Board documenting the installation of a single management measure anywhere in the Central Valley. Nor is there any evidence of a trend that the rampant violations of water quality standards throughout the

Central Valley resulting from irrigated lands discharges are on the mend. Nevertheless, the PEIR asserts that "[i]mprovements to surface water quality from implementation of management practices [under Alternatives 1] in impaired water bodies receiving inputs from lands in the program area are likely to benefit fish (e.g., by reducing contaminant loads and decreasing sedimentation and total suspended solids)." PEIR, p. 5.8-50. The PEIR makes the same assertion for Alternative 2. *Id*., p. 5.8-52. As discussed above, the coalitions' current plans are to have informal meetings with some farms to discuss BMPs. *See supra*, Section F.1. The coalitions have no legal authority to require implementation of any BMPs by any of their members. What, if any, BMPs may result from the proposed meetings is anybody's guess. And, without FWQMPs, whether or not the Regional Board would even be aware of a specific farmer's installation of measures is not clear. The PEIR's cavalier assertion that Alternatives 1 and 2, despite omitting any FWQMPs or farm-specific monitoring could somehow lead to the certain implementation of pollution reduction measures, does not resolve the uncertainties that coalitions and regional monitoring will resolve irrigated land's water pollution impacts.

Although the PEIR does acknowledge some relevant benefit from the mitigations included in Alternatives 4 and 5 farm-specific monitoring proposals, coupled with the farm-specific plan requirements, the discussion is still insufficient to remove uncertainties about the efficacy of Alternative 4's proposal. *See* PEIR, pp. 5.8-52; 5.8-53. Specifically, because a discharger may opt out of farm-specific monitoring in exchange for participation in regional monitoring, it is uncertain whether any discharger will conduct farm-specific water quality monitoring. As a result, and as discussed above, there is no certainty that the Regional Board will be able to determine that any measures installed on that farm will amount to BPTC or assure compliance with water quality standards. In addition, the PEIR's discussion of the relative benefit to water and additional pollution reductions one should expect from requiring FWQMPs coupled with farm-specific monitoring is not specific enough for the Regional Board to compare those benefits to the other alternatives.

Even assuming all of the alternatives may have some benefit on water quality, the PEIR also makes no effort to determine the time frames within which any such improvements would be realized under the various alternatives. Given the frames of reference in each alternative, it appears clear that some, for example, Alternative 5, would result in measures being installed faster and hence pollution reductions being achieved more quickly, as compared to any other alternative.

The PEIR cannot succeed in achieving the goals of CEQA if it shies away from frankly addressing the mitigations proposed in each alternative and comparing their ability or inability to reduce pollution that will be discharged to surface and groundwater from irrigated lands.

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3. The PEIR fails to discuss numerous cumulative impacts to water quality and fisheries habitat currently plaguing the Delta and other areas of the Central Valley.

The PEIR attempts to pass on evaluating the cumulative impacts of the ILRP. PEIR, p. 6-1 ("Because of the unidentified location of potential impacts, the Lead Agency has not identified any projects or programs adequately similar in nature, location, and type to result in a meaningful comparative analysis"). The notion that either the geographic area or obvious water quality and fisheries impacts of allowing discharges of irrigated lands waste is unknown is patently incorrect, as the preceding sections of the PEIR make clear despite their obvious flaws. The PEIR recognizes a number of specific categories of actions in the Central Valley that are contributing to impacts to fisheries and water quality, in addition to discharges from agricultural lands. Of particular note is the operation of the massive state and federal water projects, which are having obvious cumulative impacts to fish in the Central Valley by killing massive numbers of fish at their respective pumping facilities. *See* http://www.swr.noaa.gov/ocap/Executive_summary_to_NMFS'_CVP-SWP_operations_BO_RPA.pdf; 5.8-17 ("water projects have adversely modified [longfin smelt's] habitat, distribution, food supply, and probably abundance"); *See* NMFS Biological Opinion Regarding Proposed Long-Term Operations of the Central Valley Project And State Water Project (June 4, 2009) (http://www.swr.noaa.gov/ocap/NMFS_Biological_and_Conference_Opinion_on_the_Long-Term_Operations_of_the_CVP_and_SWP.pdf). Both EPA's registration of various pesticides that the National Marine Fisheries Service has determined will jeopardize the continued existence of listed salmon must be considered, especially considering NMFS's proposed mitigation requirements prohibiting pesticide application on irrigated lands within 1000 feet of water. PEIR, p. 5.8-39 ("NMFS (2008) concluded that EPA registration of chlorpyrifos, diazinon, and malathion would jeopardize the continued existence of, and destroy or adversely modify critical habitat for, the Central Valley spring-run Chinook salmon ESU, the Sacramento River winter-run Chinook salmon ESU, and the California Central Valley steelhead DPS"); NMFS Biological Opinion on the Effects of the U.S. Environmental Protection Agency's Proposed Registration of Pesticide Products (Nov. 18, 2008) (http://www.nmfs.noaa.gov/pr/pdfs/pesticide_biop.pdf).

The proposed Peripheral Canal being pursued by various agencies also is a reasonably foreseeable project that will enormously exacerbate water quality and fisheries impacts within the Delta. *See* Bay Delta Conservation Plan, Status Update 3 (June 2010). Likewise, the Regional Board is in the best position to evaluate the cumulative impacts of the hundreds of discharge permits it has issued to dischargers throughout the Central Valley. *See* Central Valley Regional Board Web Site, Adopted Orders (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/index.shtml). The PEIR also should evaluate, for example, cumulative bacterial issues resulting from rampant sewage overflows from municipalities throughout the Valley in combination with the bacteria coming from farms. http://www.waterboards.ca.gov/water_issues/programs/sso/sso_map/sso_pub.shtml (accessed September 27, 2010).

These and other cumulative impacts must be addressed in the PEIR. Recognizing that several projects may together have a considerable impact, CEQA requires an agency to consider the "cumulative impacts" of a project along with other projects in the area. Pub. Resources Code §21083(b); CEQA Guidelines §15355(b). It is vital that an agency assess "'the environmental damage [that] often occurs incrementally from a variety of small sources . . .'" *Bakersfield Citizens*, 124 Cal.App.4th at 1214. This requirement flows from CEQA section 21083, which requires a finding that a project may have a significant effect on the environment if "the possible effects of a project are individually limited but cumulatively considerable. . . . 'Cumulatively considerable' means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." "Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." CEQA Guidelines §15355(a). "[I]ndividual effects may be changes resulting from a single project or a number of separate projects." CEQA Guidelines § 15355(a).

"The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." *Communities for a Better Environment v. Cal. Resources Agency ("CBE v. CRA")* (2002) 103 Cal.App.4th 98, 117. A legally adequate cumulative impacts analysis views a particular project over time and in conjunction with other related past, present, and reasonably foreseeable probable future projects whose impacts might compound or interrelate with those of the project at hand.

As the court recently stated in *CBE v. CRA,* 103 Cal. App. 4th at 114:

> Cumulative impact analysis is necessary because the full environmental impact of a proposed project cannot be gauged in a vacuum. One of the most important environmental lessons that has been learned is that environmental damage often occurs incrementally from a variety of small sources. These sources appear insignificant when considered individually, but assume threatening dimensions when considered collectively with other sources with which they interact.

In *Kings County Farm Bureau v. City of Hanford,* 221 Cal.App.3d at 718, the court concluded that an EIR inadequately considered an air pollution (ozone) cumulative impact. The court said: "The [ ] EIR concludes the project's contributions to ozone levels in the area would be immeasurable and, therefore, insignificant because the [cogeneration] plant would emit relatively minor amounts of [ozone] precursors compared to the total volume of [ozone] precursors emitted in Kings County. The EIR's analysis uses the magnitude of the current ozone problem in the air basin in order to trivialize the project's impact." The court concluded: "The relevant question to be addressed in the EIR is not the relative amount of precursors emitted by the project

when compared with preexisting emissions, but whether any additional amount of precursor emissions should be considered significant in light of the serious nature of the ozone problems in this air basin."[1] The *Kings County* case was recently reaffirmed in *CBE v. CRA,* 103 Cal.App.4th at 116, where the court rejected cases with a narrower construction of "cumulative impacts."

Similarly, in *Friends of Eel River v. Sonoma County Water Agency,* (2003) 108 Cal. App. 4th 859, the court held that the EIR for a project that would divert water from the Eel River had to consider the cumulative impacts of the project together with other past, present and reasonably foreseeable future projects that also divert water from the same river system. The court held that the EIR even had to disclose and analyze projects that were merely proposed, but not yet approved. The court stated, CEQA requires "the Agency to consider 'past, present, and probable future projects producing related or cumulative impacts . . . .' (Guidelines, § 15130, subd. (b)(1)(A).) The Agency must interpret this requirement in such a way as to 'afford the fullest possible protection of the environment.'" *Id.*, at 867, 869. The court held that the failure of the EIR to analyze the impacts of the project together with other proposed projects rendered the document invalid. "The absence of this analysis makes the EIR an inadequate informational document." *Id.,* at 872.

The court in *Citizens to Preserve the Ojai v. Bd. of Supervisors* (1985) 176 Cal.App.3d 421, held that an EIR prepared to consider the expansion and modification of an oil refinery was inadequate because it failed to consider the cumulative air quality impacts of other oil refining and extraction activities combined with the project. The court held that the EIR's use of an Air District Air Emissions Inventory did not constitute an adequate cumulative impacts analysis. The court ordered the agency to prepare a new EIR analyzing the combined impacts of the proposed refinery expansion together with the other oil extraction projects.

As the PEIR notes, water quality standards already are not being met in locations throughout the Delta. As the National Academy of Sciences report and a plethora of other reports and agency decisions make clear, fisheries and water quality already are adversely affected by the massive water diversions of the State and Federal water projects and flow reductions caused by dams throughout the Valley. As NMFS makes clear, pesticide use currently approved by EPA registrations throughout the Valley is

[1] *Los Angeles Unified v. City of Los Angeles*, 58 Cal.App.4th at 1024-1026 found an EIR inadequate for concluding that a project's additional increase in noise level of another 2.8 to 3.3 dBA was insignificant given that the existing noise level of 72 dBA already exceeded the regulatory recommended maximum of 70 dBA. The court concluded that this "ratio theory" trivialized the project's noise impact by focusing on individual inputs rather than their collective significance. The relevant issue was not the relative amount of traffic noise resulting from the project when compared to existing traffic noise, but whether any additional amount of traffic noise should be considered significant given the nature of the existing traffic noise problem.

threatening salmon with extinction throughout the Central Valley. In short, the need for a cumulative impact analysis of water quality, fisheries, and other related impacts like human health, cultural, recreational, air quality, and aesthetic cannot be seriously questioned. It is plain that massive cumulative impacts from water diversions, pesticide use approvals and, with the ILRP, massive pollution from irrigated lands are occurring throughout the Central Valley and particularly in the Delta.

4. The PEIR's discussion of possible agricultural impacts is inadequate because it relies on a flawed economic analysis.

CSPA retained the economic consulting firm ECONorthwest to evaluate and comment on the economic analysis accompanying the PEIR. *See infra*, Section IV. The PEIR's consideration of agricultural impacts relies almost exclusively on the economic analysis. PEIR, p. 5.10-1 ("The catalyst for these impacts is the cost of achieving and maintaining compliance with the alternatives as discussed in *Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (ICF International 2010) (Draft ILRP Economics Report), incorporated herein by reference"). Because the economic analysis is not reliable, as is discussed in detail below and in the accompanying ECONorthwest Review, the PEIR's discussion of asserted impacts to agricultural production is unsupported by substantial evidence.

IV. THE ECONOMIC ANALYSIS RELIED UPON BY THE PEIR AND STAFF REPORT IS SUBSTANTIALLY DEFICIENT AND BIASED TOWARD THE LEAST EFFECTIVE AND COALITION-PREFERRED ALTERNATIVES.

Both the PEIR, especially in its discussion of potential agricultural impacts, and the Staff Report rely extensively on ICF International's Technical Memo. A review of that analysis by ECONorthwest, a firm exclusively dedicated to expert economic consulting, reveals fundamental errors and biases. Because of the following errors, any reliance on the Technical Memo by the Regional Board and its staff would be an abuse of discretion. The Regional Board cannot substantiate a finding under Resolution No. 68-16 or the federal antidegradation policy that under a newly adopted ILRP, "the highest water quality consistent with maximum benefit to the people of the State will be maintained." Resolution No. 68-16 (emphasis added). Similarly, to the extent the Board intends to rely on any conditional waivers to implement the next version of the ILRP, a finding by the Regional Board pursuant to Water Code § 13269 that such waiver is in the public interest also would not be supported by substantial evidence.

The ECONorthwest Review discloses the following fundamental errors in the preparation of the Technical Memo.

1. **The Analytical Objectives and Approach**: ECONorthwest demonstrates that the Technical Memo ignores generally accepted guidelines for this type of analysis, including for example guidelines prepared by the California Department

of Water Resources, an agency with, of course, considerable experience interfacing with California's agricultural community. Because of this failure, ECONorthwest concludes that the Technical Memo "provides decision-makers and stakeholders with biased and unreliable descriptions of the economic outcomes likely to materialize if the Board were to implement any of the alternatives in the EIR." ECONorthwest Review, pp. 1, 2-5.

2. **Baseline**: ECONorthwest's review establishes that ICF International's analysis "does not compare the alternatives against an appropriate baseline that describes potential future conditions absent implementation of each alternative" further biasing its conclusions. Hence, it provides an incomplete, biased representation of the alternatives' economic consequences. ECONorthwest Review, pp. 1, 5-7.

3. **Management Practices**: ECONorthwest's review discloses that ICF International only considered a truncated range of the more expensive management practices in determining projected costs of the various alternatives and excluding the less expensive and more efficient practices. ECONorthwest Review, pp. 1, 7-9. As a result, "the EIR and *Technical Memo* provide an incomplete and biased representation of the choices that realistically are available to the [Regional] Board." *Id*., p. 1.

4. **Costs and Benefits**: ECONorthwest's review shows that the Technical Memo incorrectly calculates the costs of adopting practices that improve water quality and completely overlooks major categories of economic costs and benefits, once again skewing its conclusions to support the less rigorous and coalition-preferred alternatives. *See* ECONorthwest Review, pp. 1, 9-11.

5. **Risk and Uncertainty**: ECONorthwest also criticizes the Technical Memo for failing to provide information and analysis of the risks and uncertainty facing irrigators and others from each proposed alternative. The omission of this standard component of any complete economic analysis of a program such as the IRLP is a fatal flaw in the Technical Memo. *See* ECONorthwest Review, pp. 1, 11.

6. **Regional Impacts**: Lastly, ECONorthwest's review demonstrates that the Technical Memo's discussion of regional impacts "emphasize[s] negative outcomes and ignore[s] the analytical assumptions that overstate costs and the resulting negative outcomes." ECONorthwest Review, p. 1. Even with this built-in bias, the Technical Memo still must acknowledge the improvement to the Central Valley's economy by implementation of Alternatives 3 through 5. An accurate economic analysis likely would further support the economic benefit of the alternatives that incorporate farm specific measures.

Because of these fundamental flaws, the Technical Memo, as well as the portions of the PEIR and Staff Report that rely upon it, must be redone and recirculated in order to provide the Regional Board with substantial evidence upon which it may rely.

V. THE STAFF REPORT FAILS TO ACKNOWLEDGE THE LEGAL AND POLLUTION CONTROL SHORTCOMINGS OF THE CURRENT ILRP

The Staff Report disingenuously seeks to justify a predetermined and environmentally non-protective course of action by misrepresenting the present program and carefully crafting a needlessly expensive and overly bureaucratic strawman to reject alternatives that would better protect water quality. Water quality problems and the adverse impacts resulting from the continuing discharge of agricultural pollutants are largely ignored while the Staff Report focuses on potential impacts to farmers from having to comply with water quality standards.

A. Rather Than Keep Its Eye On The Regional Board's Primary Mission To Protect Water Quality, Staff's Analysis And Proposed Alternative Make Believe The Serious Flaws In The Current Program Are Actually Benefits.

The "elements" from each of the alternatives selected by Regional Board staff to be included in the long-term irrigated lands program (or recommended alternative) are flawed and represent the continuation of a program that has failed to protect water quality.

There can be no doubt that, after seven years, the ILRP has not demonstrated any success at protecting or even reducing the rampant pollution of Central Valley waters by irrigated land dischargers. According to the *Revised Draft of the 2007 Review of Monitoring Data for the Irrigated Lands Conditional Waiver Program*, 12 July 2007, between 2003 and 2007, agricultural coalitions and the U.C. Davis Irrigated Lands Monitoring Project collected data from 313 sites throughout the Central Valley. Coalitions or individual water agencies monitored 148 sites and U.C. Davis monitored the remaining 165 sites. While the adequacy of monitoring (*i.e.*, frequency and comprehensiveness of monitoring) varied dramatically from site to site, the report presents a dramatic panorama of the epidemic of pollution caused by the discharge of agricultural wastes. Toxicity to aquatic life was present at 63% of the sites monitored for toxicity (50% were toxic to more than one species). Pesticide water quality standards were exceeded at 54% of sites monitored for pesticides (many for multiple pesticides). One or more metals violated criteria at 66% of the sites monitored for metals. Human health standards for bacteria were violated at 87% of sites monitored for coliform. More than 80% of the locations reported exceedances of general parameters (dissolved oxygen, pH, salt, TSS). It would be difficult for anyone reading the Surface Water Summary (p. 23-44) of the Staff Report to appreciate the extent of pollution caused by irrigated agriculture. An Examination of the Draft 2007 Review of Monitoring Data, Irrigated Lands Condition Waiver Program, CSPA, p. 1-2. The PEIR

Staff Report discussion of surface water quality also fails to describe and discuss the monitoring results from other programs (i.e., NPDES, SWAMP, etc.).

After seven years of the irrigated lands program, the Central Valley Regional Water Quality Control Board still does not know who is actually discharging pollutants, the points of discharge, the constituents discharged, receiving water impacts, whether management measures have been implemented or if those measures are BPTC that are effective in reducing pollutant discharges. The Board cannot enforce against recalcitrant dischargers because it cannot know who they are and dischargers have little incentive to comply because they know that monitoring far downstream cannot produce the evidence to hold them accountable.

The irrigated lands waiver adopted by the Central Coast Regional Board in 2004 is illustrative. The Central Coast Board conditional waiver is substantially more rigorous than the waiver adopted by Region 5. The Central Coast Board had hopes that, because there were fewer irrigated lands dischargers in the region, they would be able to see significant water quality improvements within the first term of the waiver. The Central Coast waiver requires farmers to enroll with the Board, prepare individual farm management plans, attend water quality education courses and participate in a third-party watershed monitoring program. Yet, it has proved incapable of protecting water quality, even in that smaller region, because it fell short of requiring farm-specific monitoring. If that more robust program in a smaller region could not protect water quality, the less stringent program currently in place and proposed to be continued by staff for the much larger Central Valley will certainly fall even further short of protecting water quality.

Unlike the Central Valley staff's report, the Central Coast staff frankly addressed their existing program's shortcomings . As the Central Coast *Preliminary Draft Staff Recommendations For An Agricultural Order* (February 2010) puts it, "[t]he current Conditional Waiver . . . lacks clarity and does not focus on accountability and verification of directly resolving the known water quality problems" and "[c]urrently, the Water board and the public have no direct evidence that water quality is improving due to the 2004 Conditional Waiver." Central Coast Staff Report, p. 6. It goes on to note, "[t]he current watershed monitoring program only indicates long-term (multi-year), receiving water changes without measuring: 1) if individual agricultural dischargers are in compliance with Conditional Waiver conditions or water quality standards, or 2) if short-term progress towards water quality improvements on farms or in agricultural discharges is occurring" and "[c]urrently, information that provides evidence of on-farm improvements and reductions in pollutant loading from farms is not required, and therefore probably does not exist for most farms. The public, including those who are directly impacted farm discharge, and the Water Board, do not have the necessary evidence of compliance or improvements. This is unacceptable given the magnitude and scale of the documented water quality impacts and the number of people directly affected. At a minimum, we continue to observe that agricultural discharges continue to severely impact water quality." *Id.*, 7.

Acknowledging the failure of its present program (i.e., "Most of the same areas that showed serious contamination from agricultural pollutants five years ago are still seriously contaminated," (*id.* Page 11), Central Coast Board staff has recommended a revised program where dischargers must; 1) enroll to be covered by the order, 2) develop and implement a farm plan that includes management practices, 3) eliminate non-storm water discharges, or use source control or treatment such that non-storm water discharges meet water quality standards, 3) demonstrate through water quality monitoring that individual discharges meet certain basic water quality targets (that are or indicate water quality standards that protect beneficial uses), 4) demonstrate through water quality monitoring that receiving water is trending toward water quality standards that protect beneficial uses or is being maintained at existing levels for high quality water and 5) farm operation must support a functional riparian system and associated beneficial uses. *Id.*, p. 20. Individual monitoring is in addition to the watershed monitoring program. *Id.*, p. 23.

Inexplicably, Central Valley Board staff persists in the illusion that inserting an unaccountable bureaucracy between the Board and actual dischargers and relying upon a monitoring program that ignores numerous waterways and collects ambient data far removed from the point of actual discharges will somehow protect water quality. Right from the opening paragraphs, the Staff Report predetermines its analysis by conjuring up five "[e]lements of the long-term ILRP alternatives found to best achieve evaluation measures are summarized below." Staff Report, p. 2. Four out of five of these elements are baseless. Staff boldly asserts that unaccountable coalitions' "local knowledge" and claimed efficiencies somehow trump the Regional Board taking a lead role in implementing an ILRP; that regional monitoring is more effective at implementing measures than farm-specific monitoring; that providing incentives is better than requiring; and that in order to coordinate with other failed regional programs, the ILRP must also avoid focusing on individual dischargers and only address problems from a distance. As is discussed above in CSPA's comments on the PEIR, these are not attributes of an effective or legal program. Staff's generalizations dramatically conflict with the Central Coast Regional Board staff's more objective and frank assessment. Contrary to Central Valley staff's blind optimism that doing less equals more, the evidence in the record demonstrates that the staff's recommendation will not be able to document any improvements in water quality, the effectiveness of applied management measures or compliance with water quality standards by individual dischargers.

1. Staff cannot continue to pretend that relying on discharger coalitions conducting regional monitoring and management plans with no plan to require BMPs by dates certain will implement BPTC on individual farms and achieve standards in a timely manner.

The first element that staff claims best achieve its "evaluation measures" is the reliance on "[t]hird-party lead or coalitions groups, as opposed to Central Valley Board lead, to take advantage of local knowledge and administrative/cost efficiencies in dealing with a few groups versus thousands of individual operations."

There is no evidence coalition groups have successfully used their purported "local knowledge" to secure and verify implementation of management measures at the farm level and quantitatively reduce the mass loading of agricultural contaminates. *See supra*, Section G.1. Nor is there any evidence of cost efficiencies that would materialize if coalitions actually instituted a comprehensive program that successfully complied with regulatory requirements and held farmers accountable for implementing management measures and reducing pollutant loading.

Other Central Valley Board regulatory programs with inadequate resources have been far more successful in protecting water quality than the irrigated lands program. For example, the Board has less than a dozen staff to manage a stormwater program that oversees more than 7,500 industrial and construction operations and more than 93 Phase I and Phase II municipal permits. *State of the Central Valley Region*, slide 32, presentation by Executive Officer Pamela Creedon at the Central Valley Water Board meeting of August 2007. The stormwater program requires industrial and construction program applicants to submit a Notice of Intent, develop a comprehensive Stormwater Pollution Prevention Plan (SWPPP), implement BMPs, monitor individual discharges, revise BMPs, iteratively install new BMPs as needed and submit annual reports. Municipal permits are complicated, resource draining and consume the majority of staff time. However, CSPA has reviewed the files of literally hundreds of industrial and construction program permittees and found that the severely understaffed program (the program has less than 12% of needed staff, *Id.*) has been able to routinely review annual reports, conduct many routine site evaluations, send corrective and enforcement notices to numerous facilities. The relative successes of the stormwater program stand in stark contrast to the black hole of the irrigated lands program that remains unable to document any implementation of management measures or reduction of pollutant mass loading. For staff to claim still unproven coalitions as a key element to success is contrary to the available evidence.

2. Staff cannot protect water quality by making believe that regional monitoring results in clear expectations for dischargers or by putting reducing paperwork ahead of protecting water quality.

The next key element to success identified by the Staff Report is to rely upon "[r]egional surface and groundwater quality management plans, as opposed to individual water quality management plans, to minimize paperwork/administrative burdens while clearly defining the expectations and approach for addressing water quality problems." Staff Report, p. 2. Again, staff cannot cite to any evidence that this statement is reliable. Avoiding paperwork is simply a euphemism for not collecting information. At some point, staff has to acknowledge that the Board cannot claim to regulate 30,000 farms without at some point gathering information from them about their pollution discharges. The notion that the requisite information becomes less bureaucratic and involves less paperwork by inserting fictitious entities – with their own layers of management and paperwork – between the Regional Board and the dischargers is nonsensical. And staff has no explanation as to how plans devised on a

regional basis can clearly define expectations of all relevant dischargers in that area. Especially where, as the PEIR acknowledges, "[t]he appropriate management practice is typically selected on a site-specific or property-specific basis." PEIR, p. 3-9. Even the Staff Report admits that "[w]ith regard to selection of measures and practices, the Central Valley Water Board and USEPA recognize that there is often site-specific, crop-specific, and regional variability that affects the selection of appropriate management measures, as well as design constraints and pollution-control effectiveness of various practices." Staff Report, p. 66-67. Only by addressing site-specific measures that are at least BPTC and assure compliance with standards can expectations and water quality measures be clearly defined. To rely exclusively on regional management plans rather than FWQMPs, the Board will only continue to maintain the existing fog that obscures individual farm's actions or, more likely, inactions. *See supra*, Section F-2.

3. Staff cannot protect water quality by making believe that repeating the regional scale of other monitoring efforts that have not curtailed irrigated lands' pollution dischargers will miraculously characterize effluent quality and BPTC implementation at individual farms.

Staff continues to regulate in a dream state by claiming a third element to achieve success is that "[r]egional surface and groundwater quality monitoring, as opposed to individual or no water quality monitoring, to take advantage of cost efficiencies in coordinating with other monitoring efforts while providing sufficient information to characterize water quality." Once again, staff's claim that regional monitoring miles downstream from a farm's discharge location would characterize that discharger's water quality is absurd. It is not clear what monitoring efforts staff is referring to, but there is no evidence that any regional monitoring effort to date has reduced any irrigated lands pollution in the Central Valley. For example, the Rice Pesticide Program has not succeeded in reducing pesticide discharges from rice fields by relying on regional monitoring. Rice farmers monitor specific fields before releasing their irrigation waters. As discussed above, like the absence of FWQMPs, allowing farm dischargers to rely solely on regional monitoring to determine water quality impacts occurring near their discharge locations or to evaluate whether their management measures are BPTC defies common sense. *See supra*, Sections F.1 - .2, G.2. No current monitoring program is monitoring only farm discharges. Nor has any existing program, including even the current ILRP regional monitoring, reduced the massive pollution from irrigated farms. Any "cost efficiencies" claimed by staff are simply another way of saying they do not want the most relevant information necessary to implement BPTC and achieve water quality standards.

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B. The "Goals and Objectives" selected by a stakeholder group dominated by agriculture protect the regulated community more than they protect water quality, in contrast to virtually every other regulatory program.

As discussed in Section III.C above, CSPA is concerned with the language of the objectives selected by the coalition-dominated stakeholder process. CSPA's concerns are heightened by the further spin placed on the objectives by staff's interpretations of those objectives applied in the staff report. Invariably, staff's interpretation of each objective favors the status quo and avoiding any site specific regulation of farms and trumping resolution 68-16.

Staff restates the PEIR's goals and objectives. Staff Report, pp. 98-99. The objectives, other than the objectives of restoring and/or maintaining beneficial uses, ensuring that all state waters with the Central Valley meet applicable water quality objectives and ensuring that irrigated agricultural discharges do not impair Central Valley communities' and residents' access to safe and reliable drinking water are flawed. In fact, the other four objects work against the successful attainment of restoring beneficial uses and meeting standards. Yet, invariably, the non-water quality or public safety objectives are the hooks which staff uses to propose an ineffectual ILRP recommendation.

For example, the goal of maintaining the economic viability of agriculture in California's Central Valley is highly subjective because it contains no yardsticks by which to measure impacts to irrigated agriculture and is buttressed by a seriously deficient economic analysis. Retirement of some farmland may be an overall economic benefit where overproduction has depressed commodity prices. Retirement of lands because of an inability to continue externalizing adverse costs of production benefits farmers who internalize those costs and comply with regulatory requirements. Economic viability of agriculture cannot be considered in a vacuum where the costs of agricultural pollution are simply transferred to other economic sectors, *i.e.*, recreation, commercial fishing, public health, municipalities, etc. It is unreasonable to establish a program goal of maintaining the economic viability of agriculture at the expense of other sectors of society who comply with requirements to protect water quality.

Also for example, the objective of maintaining "appropriate" beneficial uses ignores mandates to protect all identified beneficial uses. Encouraging "implementation of management practices that improve water quality in keeping with the first objective without jeopardizing the economic viability for all sizes of irrigated agriculture" ignores the fact that discharging pollutants is a privilege allowable only so long as measures are implemented to reduce or eliminate conditions of pollution. Likewise, providing "incentives for agricultural operations to minimize waste discharge to state waters" ignores that this is a mandated requirement. The objective to coordinate with other programs, such as the Grasslands Bypass Project, TMDLs, CV-Salts and WDRs for dairies is simply a non sequitur as none of those programs have been effective in cleaning up polluted waterways. For example, the Central Valley Board recently

extended the compliance schedule for the Grasslands Bypass Project to more than 20 years. To "promote coordination with other regulatory and non-regulatory programs associated with agricultural operations" is simply an attempt to replicate other regional programs that have failed to protect water quality. The Central Valley Board has apparently forgotten the failures of the Management Agency Agreement with the Department of Pesticide Regulation (DPR), where after the five-year agreement had expired, DPR claimed it didn't have the authority to implement the measures it had agreed to.

The last four objectives simply provide Regional Board staff the rationale to avoid rigorously implementing what staff believes to be a politically unpalatable program that would meet the first objective of maintaining beneficial uses and meeting water quality standards. Consequently, staff dismisses individual edge-of-field monitoring because it would be expensive, *i.e.*, subject farmers to the same requirements applicable to every other segment of society that discharges pollutants to waters of the state. However, without individual discharger monitoring, the Board will never know the impacts of individual discharges or whether implemented management measures are effective.

Direct Regional Board administration is rejected because it would require the Regional Board to candidly acknowledge the politically unpalatable need to assess additional fees to provide sufficient staff to regulate 30,000 plus farms spread over eight million acres. In 2002-05, Regional Board staff estimated that 40 to 70 staff would be needed to effectively implement the program. This seems to be a reasonable estimate based upon the stormwater program.

C. Staff's Recommended Alternative Continues The Existing Flaws Of The Existing Program.

1. The "recommended alternative" cannot identify sources of pollution, localized water quality impacts, the implementation of Best Management Practices (BMPs) or the effectiveness of BMPs.

The reality is that the regional monitoring approach embraced by staff has been woefully inadequate, as revealed by even a cursory review of coalition monitoring reports. What staff characterizes as cost efficiencies is simply insufficient monitoring that is incapable of characterizing all receiving waters, let alone identify specific sources or quantify the effectiveness of management measures. Coalition monitoring only represents a small percentage of irrigated acres. For example, review of recent monitoring reports submitted to the Regional Board by coalitions representing irrigated lands that discharge into the Sacramento-San Joaquin Delta estuary or waters tributary to the estuary shows that:

The San Joaquin County and Delta Water Quality Coalition comprises approximately 609,134 acres of irrigated land. SJCDWQC Annual Monitoring Report

2010, p. 6. Between October 2008 and March 2009, the Coalition monitored 10 sites and six sites from April 2009 through December 2009. In addition, three sites were monitored for Management Plan monitoring. *Id.*, p. 1. The report observes, "…water quality is still not protective of beneficial uses across most of the Coalition." *Id.*, p. 4. Rough calculations reveal that irrigation season monitoring represented approximately one site for every 60,000 plus acres.

The East San Joaquin Water Quality Coalition comprises approximately 919,730 acres of irrigated land. ESJWQC Annual Monitoring Report 2010, p. 5. Between October 2008 and December 2009, the Coalition monitored 20 sites and eleven additional sites were monitored for Management Plan monitoring. *Id.*, p. 1. Fourteen sites were monitored during the 2009 irrigation season and 12 sites were monitored during the 2009 wet season. *Id.*, p. 23-24. The report observes, "…water quality is still not protective of beneficial uses across most of the Coalition." *Id.*, p. 4. Rough calculations reveal that irrigation season monitoring represented approximately one site for every 54,000 plus acres.

The Westside San Joaquin River Watershed Coalition comprises approximately 460,500 acres. Westside Coalition Semi-Annual Report, 15 June 2010, p. 3. The Coalition monitors 17 discharge sites during the irrigation and wet seasons. *Id.*, Table 3, p. 5. This represents approximately one site for every 27,000 acres.

The Sacramento Valley Water Quality Coalition comprises approximately 27,000 square miles and contains over a million acres of farms. SVWQC Annual Monitoring Report 2009, March 2010, p. 3. Apparently, the Coalition monitored 32 sites, of which 18 were sampled during the irrigation season. *Id.*, Table 5, Planned Annual Sampling Frequency, p. 19. This would represent irrigation season monitoring of one site for approximately every 55,000 acres.

Monitoring a downstream point draining thousands of acres accomplishes little other than long-term trend analysis. And trend analysis requires a program that consistently monitors the same set of constituents over many years. Most coalition sites are not monitored every year for the same parameters and, consequently, existing coalition monitoring programs are unreliable even for trend analysis. In any case, trend analysis of downstream monitoring points can never establish whether an individual upstream discharger is in compliance with water quality standards or implementing BPTC.

Staff has apparently forgotten that the 2003 waiver originally required coalitions to yearly monitor all major drainages, 20% of intermediate drainages on a yearly rotating basis and minor drainages where downstream problems are identified. Those requirements have been substantially relaxed and currently large areas of the Central Valley are not monitored and have never been monitored, despite identification of serious downstream water quality problems.

Monitoring of actual discharge points is important because upstream waterways are disproportionally important as their increased energy inputs, higher invertebrate production, spawning, nursery and rearing habitat and lower discharge make these smaller aquatic systems vital to the overall health of the aquatic system. Larval fish and their food supplies found in these areas also are particularly vulnerable to adverse impacts of pesticides and other pollutants. Monitoring at the edge-of-field is crucial for evaluating the presence of BPTC and determining if recommended management practices are being implemented properly or if benefits from adopted practices are actually being realized.

2. The "recommended alternative" cannot ensure that dischargers will demonstrate that they have implemented Best Practical Treatment and Control (BPTC) or prevent degradation of water quality.

The Staff Report states, "… the Regional Water Board still must require the discharger to demonstrate that the proposed manner of compliance constitutes BPTC (SWRCB Order No. WQ 2000-7)." Staff Report, p. 62. And that, "…implementation of the program must work to achieve site-specific antidegradation requirements through implementation of BPTC and representative monitoring to confirm the effectiveness of the BPTC measures in preventing or minimizing degradation. Any regulatory program adopted will rely on implementation of practices and treatment technologies that constitute BPTC, based to the extent possible on existing data, and require monitoring of water quality to ensure that the selected practices in fact constitute BPTC where degradation of high quality waters is or may be occurring." *Id.*, p. 66
However, staff's recommended alternative abandons any effort to implement staff's own admonition. *See supra*, Section C.2.

3. The "recommended alternative" cannot ensure that the Regional Board can enforce program requirements.

As discussed above, any enforcement efforts by the Regional Board will be hampered by staff's recommendation. *See supra*, Section F.2. Staff's concept that enforcement will be vigorous by not having information available in the form of FWQMPs and individual monitoring data to assist in prioritizing inspections and enforcement cannot be rationalized. Without this information, staff's enforcement efforts will be as nominal as we have seen for the last seven years. Instead of enforcing water quality requirements, staff will be lead down a well-papered path of regional coalition monitoring – none of which will identify a single potential violator.

4. The "recommended alternative" is clearly inconsistent with the state's Non-Point Source Control Policy.

For the same reasons discussed above, staff's recommendation fails to comply with the NPS Policy. *See supra*, pp. Section F.2. Like the PEIR's first four alternatives,

staff's recommendations falls well short of all five key elements required by the NPS Policy. *Id*.

5. The "recommended alternative" cannot be in the public interest.

Staff continues to treat irrigated agriculture as a privileged sector by allowing farmers to externalize adverse production impacts by transferring the costs of pollution from the polluter to the general public. The recommended alternative does not serve the interests of California's 35 million residents. It arguably does not even serve the interests of the discharger's it seeks to immunize from monitoring, reporting and permitting requirements applicable to everyone else.

Central Valley fisheries are experiencing catastrophic collapse. The team of federal and state scientists investigating the decline of fisheries has identified toxic pollutants as one of the three major suspected causes of the collapse of the Delta's pelagic fishery. This collapse has cost the recreational and commercial fishing communities tens upon tens of millions of dollars.

The degraded aquatic ecosystem in the Delta threatens the reliability of the delivery system that supplies water to 23 million Californians. Polluted waters have forced municipalities to spend hundreds of millions of dollars on increased wastewater and drinking water treatment. Degraded waters threaten public health and have diminished the aesthetic and recreational enjoyment of millions of individuals.

Central Valley agriculture is a relatively small part of the California community. According to the July 2010 (revised) employment data by the California Employment Development Department, total employment in the 34 Central Valley counties under the ILRP and analyzed in the PEIR's economic analysis is 3,509,620, of which farm labor comprises 237,000 or 6.758%. EDD, Employment by Industry Data at: http://www.labormarketinfo.edd.ca.gov/?pageid=166. Statewide, the agriculture production and processing industry directly accounts for approximately 4.3% of the state output, 3.8% of the jobs, 2.5% of labor income and 2.9% of value added in the state. The Measure of California Agriculture, 2006, Agricultural Issues Center, University of California, Chapter 5, Table 5.5, p. 10.

The PEIR's severely deficient economic analysis with its unrealistic assessment of the cost impacts of potential management measures, acknowledges that Alternative 5, despite being burdened with absurd administrative and monitoring requirements, would be of negligible cost to the overall economy. In fact the economic analysis predicts that, under Alternative 5: 1) jobs in the Central Valley would increase, 2) personal income and industrial output would increase in the Tulare Lake Basin, 3) personal income would only decrease by 0.013% in the Sacramento River Basin and by 0.019% in the San Joaquin River Basin and 4) industrial output would only decrease by 0.045% in the Sacramento River Basin and by 0.043% in the San Joaquin River Basin. And the economic analysis inexplicably failed to analyze the cost benefits of reduced pollution. Had the advantages of better water quality been evaluated, implementation of

Alternative 5 would be shown to result in significant economic benefit across the spectrum for the entire Central Valley.

The recommended alternative will not reduce agricultural pollution any time in the near future. Nothing in the recommended alternative precludes agricultural dischargers from continuing the historic trend to discharging wastes into the foreseeable future. At its core, the recommended alternative will perpetuate substantial discharges of wastes from thousands of farms to impaired waters throughout the Central Valley, causing irreversible and substantial harm to degraded and stressed ecosystems, threatening public health and imposing increased costs to millions of Californians.

It cannot be in the public interest to exempt one small segment of the California economy from regulatory requirements applicable to everyone else. It clearly cannot be in the public interest, as the recommended alternative does, to exempt farmers from having to monitor their discharges in order to establish compliance with water quality standards and BPTC requirements.

6. **CSPA agrees ILRP must restrict groundwater pollution but unfortunately staff's proposed reliance upon regional efforts is unlikely to be more successful than existing programs that have chaperoned groundwater degradation.**

Groundwater pollution is a serious problem and relying upon regional efforts is unlikely to address site-specific sources of groundwater pollution. The staff alternative of requiring farmers to participate in a regional groundwater program once every five years ignores the obvious protective step of requiring individual farms to monitor their own wells to evaluate groundwater pollution. The staff recommendation also contains no specific measures to identify and prevent contamination of groundwater from management measures implemented to prevent surface water pollution.

The California Department of Water Resources (DWR) has concluded that water from California's groundwater basins "has been the most important single resource contributing to the present development of the state's economy." Between 25% and 40% of California's water supply comes from groundwater. That figure can rise to as much as two-thirds during critically dry years. Fifty percent of California's population depends upon groundwater for all or part of their drinking water. Data from the waterboards, USGS, Department of Health, DPR and others, demonstrate that groundwater has been severely degraded. DWR has stated that three-fourths of the impaired groundwater in California was contaminated by salts, pesticides, and nitrates, primarily from agricultural practices. Thousands of public drinking water wells have been closed because of pollution. Many of California's more than 71,000 agricultural irrigation wells are degraded or polluted. USGS data collected over a ten-year period in Fresno County showed that some 70% of the wells sampled exceeded the secondary MCL and agricultural goal for total dissolved solids. Kings County was even worse, with 87% exceeding criteria. Even the State Board's own data indicates that more than one third of the areal extent of groundwater assessed in California is so polluted that it

cannot fully support at least one of its intended uses, and at least 40 percent is either impaired by pollution or threatened with impairment.

For example, a study conducted by the United States Geological Survey documented extensive contamination of groundwater by pesticides applied to rice fields. Dawson, B., USGS, "Shallow Ground-Water Quality Beneath Rice Areas in the Sacramento Valley, California 1997" (2001). Pursuant to an existing Basin Plan prohibition, rice growers are required to hold their irrigation waters for up to 30 days in order to facilitate the breakdown of toxic pesticides. Rice fields are typically flooded from April to September with some significant portion also flooded during winter months to help break down leftover straw. Detections of pesticides and nitrites in groundwater beneath rice fields were attributed to pesticide and fertilizer applications to the fields. The study explains that holding irrigation waters on the fields in order to protect surface water may be allowing more recharge containing the pesticides molinate and thiobencarb to reach shallow groundwater. Another study in the record documents routing of pesticide-contaminated surface runoff from orchards into drainage wells that drain the contaminated runoff into groundwater. Troiano, J, et al., Cal. Dept. of Pesticide Regulation, "Movement of Simazine in Runoff water from Citrus Orchard Row Middles as Affected by Mechanical Incorporation" (1998) ("evidence linked contamination [of groundwater] to movement of [pesticide] residues in orchard runoff water that was directed into drainage wells"). *See also* Ingalls, Charles A., U.C. Davis, pp. 5-10, "Movement of Chemicals to Groundwater," of "Protecting Groundwater Quality in Citrus Production" (1994)).

The USGS study and other studies show that one potential negative environmental impact of a management measure that stores polluted water as a means of protecting surface water quality is an acceleration of the pollutants discharged into groundwater through recharge or existing pathways such as wells. Nevertheless, staff's proposed alternative relying upon regional monitoring efforts is unlikely to identify impacts from implementation of management measures and specific monitoring requirements must be included to prevent redirected impacts of management measures employed to protect surface waters.

VI. CONCLUSION.

After seven years of the irrigated lands program, the Central Valley Regional Water Quality Control Board still does not know who is actually discharging pollutants, the points of discharge, the constituents discharged, receiving water impacts, whether management measures (or BMPs) have been implemented or if those BMPs have been effective in reducing pollutant discharges. The Board cannot enforce against recalcitrant dischargers because it cannot know who they are and dischargers have little incentive to comply because they know that monitoring far downstream cannot produce the evidence to hold them accountable. The PEIR continues the theme of not providing the Regional Board the necessary information to make a decision that will protect water quality and human health. Staff proposes an alternative that perpetuates the existing program's flaws, including basic compliance with the NPS Policy and Resolution No. 68-

16. On the other hand, CSPA's alternative sets forth a reasonable program that would comply with statutory requirements, protect water quality and, where it is consistent with those two goals, reduce the potential burden on the farming community. CSPA respectfully requests that the Regional Board instruct staff to redraft their recommended program, send the PEIR back to be supplemented with necessary elements and include detailed analysis of an improved staff recommendation, CSPA's recommendation, and other required elements. We appreciate staff's and the Regional Board's consideration of these comments.

Sincerely,

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Encls.

An Economic Review of the Draft Irrigated Lands Regulatory Program Environmental Impact Report

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ECONorthwest specializes in the economic and financial analysis of public policy. ECONorthwest has analyzed the economics of resource-management, land-use development, and growth-management issues for municipalities, state and federal agencies, and private clients for more than 30 years.

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This work was produced for Lozeau Drury LLP.

I. INTRODUCTION

The Central Valley Water Board (Board) authorized the preparation of an Environmental Impact Report for the Irrigated Lands Regulatory Program (ILRP). The ILRP regulates water discharges from irrigated agricultural lands. ILRP goals include preventing agricultural discharges from impairing receiving waters. At the Board's direction, consultants prepared the *Draft Irrigated Lands Regulatory Program Environmental Impact Report (Draft EIR)*. Appendix A to the *Draft EIR* is the *Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program* (*Technical Memo*).

Michael Lozeau of Lozeau Drury LLP, contracted with ECONorthwest (ECONW) to review and provide preliminary comments on the *Technical Memo*. Specifically, he asked that we review the economic analysis described in the *Technical Memo*, including the analytical approach, simplifying assumptions, data, analyses and conclusions, to determine if it provides reliable information on which the Board can base decisions regarding the alternatives described in the *Draft EIR*. In this report we describe our preliminary findings to date. If we are asked to review additional information, or address additional topics, we may revise our critique and findings.

II. OVERVIEW OF RESULTS

The following discussion substantiates our conclusion that the *Technical Memo* developed in support of the *Draft EIR* has serious errors of omission and commission that violate the generally accepted standards of practice that apply to this type of economic analysis. Because of these errors, the report does not provide a reliable basis for understanding the full potential economic consequences of each the five alternatives the *Draft EIR* considers. It also does not fully depict the differences in potential economic consequences among the five alternatives. The various errors are interrelated but, to facilitate our discussion of them, we separate them into these six categories:

A. **The Analytical Objectives and Approach**: The study's analytical objectives and approach do not follow generally accepted guidelines. The analysts ignored standards and procedures developed by the California Department of Water Resources specifically for this type of economic analysis. The resulting analysis is flawed and incomplete, and, hence, it provides decision-makers and stakeholders with biased and unreliable descriptions of the economic outcomes likely to materialize if the Board were to implement any of the alternatives in the *Draft EIR*.

B. **Baseline**: The economic analysis described in the *Technical Memo* does not compare the alternatives against an appropriate baseline that describes potential future conditions absent implementation of each alternative. Hence, it provides an incomplete, biased representation of the alternatives' economic consequences.

C. **Management Practices**: The management practices considered in the *Draft EIR* and *Technical Memo* do not reflect the full range of options available to irrigators. They particularly exclude low-cost, high-benefit options. Hence, the *Draft EIR* and *Technical Memo* provide an incomplete and biased representation of the choices that realistically are available to irrigators or the Control Board.

D. **Costs and Benefits**: The analysis described in the *Technical Memo* incorrectly calculates the costs of adopting practices that improve water quality. The analysis also overlooks major categories of economic costs and benefits that would be affected by the alternatives. Hence, it provides an incomplete, biased representation of the alternatives' economic costs.

E. **Risk and Uncertainty**: The *Technical Memo* provides no information on how each of the five alternatives would affect the risks and uncertainty facing irrigators and others. Economic analyses of the scale and scope described in the *Technical Memo* typically include analyses of risk and uncertainty as a matter of course. The analysts' failure to comply with this generally accepted standard of practice gives decision-makers and stakeholders incomplete descriptions of the economic significance of the alternatives' outcomes.

F. **Regional Impacts**: The *Technical Memo* provides a biased and incomplete description of the regional impacts of the alternatives. The conclusions in this section emphasize negative outcomes and ignore the analytical assumptions that overstate costs and the resulting negative outcomes.

We describe each category in the following sections.

III. Analytical Objectives and Approach

The study's analytical objectives and approach do not follow generally accepted guidelines. In particular, the analysts ignored standards and procedures developed by the California Department of Water Resources specifically for this type of economic study. The resulting analysis is flawed and incomplete, and provides decision-makers and stakeholders with biased and unreliable descriptions of the economic outcomes likely to materialize if the Board were to implement any of the five alternatives in the *Draft EIR*.

The *Technical Memo* gives this description of its analytical objectives and approach:

> "The analysis of economic (and fiscal) effects for the long-term Irrigated Lands Regulatory Program (ILRP) focuses on addressing the following three analytical questions.
>
> - "How much currently is being spent annually by growers, landowners, and administering entities in the Central Valley on compliance with the ILRP pollution control implementation program?

- "What are the expected additional costs, both to growers and administering entities, of compliance with the long-term ILRP alternatives?
- "How is imposition of these additional costs expected to affect the economic viability of farming in the Central Valley? (*Technical Memo* p. 1-1)

By focusing on just these three questions, the study's authors restricted their analysis to a subset of the economic issues the Board must consider to satisfy its obligations. Hence, the *Technical Memo* cannot provide an adequate basis for the Board's consideration of these issues. The Board's responsibilities extend well beyond the narrow set of costs described in the *Technical Memo*. For example, the Board's website describes its mission as, "To preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and *efficient use* for the benefit of present and future generations."[1] [emphasis added] The Board can assess the extent to which the *Draft EIR's* alternatives promote efficient water use only if it weighs all of their relevant economic costs and benefits, not just those that are the focus of the *Technical Memo*.

The Board's website also lists the strategic goals for California's nine water boards, including the Central Valley Board. These goals include:

- "Goal 1 - The Boards' organizations are effective, innovative and responsive."
- "Goal 2 – Surface waters are safe for drinking, fishing, swimming, and support healthy ecosystems and other beneficial uses."
- "Goal 3 – Groundwater is safe for drinking and other beneficial uses."
- "Goal 6 – Water quality is comprehensively measured to evaluate protection and restoration efforts."[2]

From an economic perspective, the analysis described in the *Technical Memo* is neither effective nor innovative given the study's limited and incomplete focus relative to the generally accepted guidelines for these types of economic analyses. We describe these guidelines below. For example, the study ignores the economic benefits of the *Draft EIR's* alternatives on drinking water, fishing, swimming, ecosystems and other beneficial uses. A comprehensive assessment of the changes in water quality brought about by the *Draft EIR* alternatives would include these and other relevant costs and benefits.

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[1] California Water Boards web site http://www.swrcb.ca.gov/centralvalley/about_us/water_boards_structure/index.shtml, accessed September 22, 2010.

[2] California Water Boards web site http://www.swrcb.ca.gov/centralvalley/about_us/water_boards_structure/index.shtml, accessed September 22, 2010.

Specific to the study at issue, the *Existing Conditions Report (Existing Conditions)* referenced throughout the *Technical Memo,* describes the regulatory setting for the economic analysis and notes the purpose of water quality regulations in California:

> "Water quality regulation and permitting processes are designed to limit the discharge of pollutants to the environment in an effort to achieve the highest surface water and groundwater quality, protect fish and wildlife and their habitats, and protect other beneficial uses (e.g., domestic and agricultural water supply and recreational resources)." (*Existing Conditions* p. 2-1)

The study's analytical approach focuses on a narrow subset of the full range of potential economic outcomes of the *Draft EIR's* alternatives, and, hence, provides limited and biased information regarding the proposed regulations' overall economic costs and benefits. Board members and others interested in furthering the Board's goals will find little useful information in the economic analysis described in the *Technical Memo*. This study does not serve these groups well.

Those interested in an unbiased and comprehensive assessment of the economic outcomes of adopting the *Draft EIR* alternatives will find the study's deficiencies especially troubling, given the fact that the study area includes a large part of California. It also includes the majority of the state's irrigated land. The study leaves uncounted many of the economic costs and benefits that would occur throughout much of the state with the adoption of the *Draft EIR* alternatives. The *Existing Conditions* describes the geographic extent of the Board's responsibilities.

> "The jurisdiction of the California Regional Water Quality Control Board, Central Valley Region … extends from the Oregon border to the northern tip of Los Angeles County and includes all or part of 38 of the State's 58 counties. … The three basins [major watersheds included in the study area] cover about 40% of the total area of the State and approximately 75% of the irrigated acreage [citation omitted]." (*Existing Conditions*, page ES-1)

An economic study of this magnitude should conform to generally accepted analytical guidelines. Many such guidelines apply here.[3] The California Department of Water Resources' *Economic Analysis Guidebook* (*Guidebook*), is particularly relevant, given the study area and topic. The *Guidebook* notes,

> "… the Department of Water Resources (DWR) has a policy that all economic analyses conducted for its internal use on programs and projects be fundamentally consistent with the federal *Economics and Environmental*

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[3] Examples include: California Department of Water Resources. 2008. *Economic Analysis Guidebook*, January; U.S. Army Corps of Engineers. 1983. *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*. March—and 2009 Draft Update; U.S. Environmental Protection Agency. 200. *Guidelines for Preparing Economic Analyses*. EPA 240-R-00-003. September.

Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G) …

"It is also DWR policy to adopt, maintain, and periodically update its own Economics Analysis Guidebook, which is consistent with the P&G but can also incorporate innovative methods and tools when appropriate."

"*The Economic Analysis Guidebook* (Guidebook) was developed to assist DWR economists in performing economic analyses …"(*Guidebook*, p. vii)

Comparing the approach described in the *Technical Memo* with the *Guidebook's* recommended approach shows the extent of the study's analytical deficiencies. For example, the *Guidebook* describes generally accepted methods of conducting economic analyses of public policies that affect water. The *Guidebook* describes three methods of economic analysis (*Guidebook* p. 12):

- A cost-effectiveness study identifies the least cost method of achieving the stated goals. The analysis in the *Technical Memo* is not a cost-effectiveness analysis because, as the *Memo* states, the analysis did not include information on the effectiveness of the management practices in the *Draft EIR* alternatives.
- A benefit-cost (B-C) analysis compares the social benefits of a proposed action with the social costs. The economic analysis at issue is not a B-C analysis because it considered only a subset of relevant costs and benefits. This narrow focus yields a biased and incomplete description of the direct or initial economic outcomes of adopting the *Draft EIR* alternatives.
- A socioeconomic impact (SI) analysis describes a broader set of impacts than a B-C study because it considers regional or indirect impacts in addition to direct benefits and costs. Given that an SI analysis is more comprehensive than a B-C analysis, the economic analysis in the *Technical Memo* falls far short of the generally accepted standards for SI analyses.

The approach described in the *Technical Memo* does not satisfy the *Guidebook's* standards. The *Technical Memo's* description of analytical methods also lacks foundation or citation to relevant economic literature that supports the approach.

IV. BASELINE CONDITIONS

The *Technical Memo* does not compare the alternatives against an appropriate baseline that describes potential future conditions absent implementation of each alternative. Hence, it provides an incomplete, biased representation of the alternatives' economic consequences.

Generally accepted standards applicable in this context include establishing a baseline against which analysts compare the economic outcomes of policy alternatives. Analysts calculate the amount of economic change attributed to a policy by comparing economic conditions that would result with the policy against baseline economic conditions. A properly defined baseline takes into

account economic changes that will occur for reasons other than the policy alternative. Analyses that lack a baseline, or use an improperly defined baseline, yield biased results because costs or benefits that would have otherwise occurred are mistakenly attributed to the policy alternative. The *Guidebook* describes the importance of establishing a baseline using a *with* and *without* analytical approach.

> "The objective of economic analysis is to determine if a project represents the best use of resources over the analysis period …:
>
> > The test of economic feasibility is passed if the total benefits that result from the project exceed those which would accrue without the project by an amount in excess of the project costs. It is important that the comparison be *with* and *without* rather than *before* and *after* because many of the after effects may even occur without the project and can thus not properly be used in project justification. …" (*Guidebook* p. 5)

The *Technical Memo* lacks a clear and concise description of baseline conditions. The available information indicates that analysts did not control for factors other than the *Draft EIR's* alternatives that can affect irrigators' costs of managing water quality. For example, the analysis incorrectly attributes costs of management practices previously implemented to the future costs of adopting the *Draft EIR's* alternatives. This overstates the costs of adoption.

> "Although Alternative 1 represents the continued implementation of current Central Valley Water Board policies, limited information was available to determine the extent of management practice implementation to date. Further, the existing conditions information used as a baseline for analysis dates from the early 2000s. As a result, changes from Alternative 1 relative to existing conditions do not capture implementation that has already occurred at the time of this report, and thus likely overstate the impacts of further implementation of Alternative 1." (*Technical Memo* p. 1-2)

The analysis also incorrectly attributes adoption costs to the *Draft EIR's* alternatives in cases where growers adopt management practices for reasons other than the alternatives. The authors recognize the importance of accounting for costs attributable to other factors:

> "Existing conditions corresponds to the level of water quality management practices that are in the baseline. It is acknowledged that most practices are not implemented to improve water quality but rather to provide for another agronomic or economic need. … Therefore adjustments were made to best capture costs attributable only to improvements in water quality. …."(*Technical Memo* p. 2-2)

Here they describe the adjustment:

> "Potential cost savings or other benefits from the irrigation system changes also were considered. These included estimates of savings in grower's costs for water, fertilizer, and labor and revenue increases resulting from improved crop yield and quality. These benefits were subtracted from the implementation cost of the irrigation system or management changes, so the analysis considered only the net cost to growers of implementing a change." (*Technical Memo* p. 3-1)

This "adjustment," however, ignores the fact that the management practices at issue were adopted for reasons *other than* the *Draft EIR* alternatives. Such changes belong in the baseline conditions and not the *Draft EIR* alternatives. The authors provide no citations to economic literature or other relevant sources that support such an adjustment. The resulting adjusted costs overstate the true costs of the alternatives.

Our critique of the *Technical Memo's* treatment of the alternatives' costs (see below) notes that the analysts selected some of the most expensive management alternatives available. Assuming for the sake of argument that we agree with the described adjustment—which we do not—using more realistic adoption costs would yield lower or negative "net" costs of adopting the practices in the *Draft EIR* alternatives.

Had the analysts used a *with* vs. *without* analytical approach they could have isolated the extent to which irrigators adopt management practices that have water-quality impacts, but were adopted for other reasons. For example, they may change irrigation practices from flood to drip or sprinkler systems not to improve water quality but to reduce their fertilizer and pesticide costs. The analysts acknowledge the likelihood that irrigators make such changes for purposes other than to accomplish the Board's water-quality goals. But they then do not account for these changes in a manner that yields an accurate, unbiased representation of the costs of the alternatives being considered by the Board.

A similar conclusion applies to the *Technical Memo's* treatment of various laws that affect irrigators' behavior. Chapter 2 of the *Existing Conditions* report, for example, notes that the Federal Endangered Species Act (ESA) could affect future irrigation practices. The *Technical Memo*, however, makes no provision for the potential impacts of the ESA or other laws and regulations on irrigation methods and costs. Instead, it attributes all future irrigation changes and costs to the *Draft EIR* alternatives. A *with* vs. *without* analytical approach would acknowledge that regulations other than the *Draft EIR* alternatives can influence irrigators' practices and costs in the future.

V. Management Practices

The management practices considered in the *Draft EIR* and *Technical Memo* do not reflect the full range of options available to irrigators. Instead, they consider seven practices that emphasize high-cost options and exclude low-cost, high-

benefit options. Hence, the *Draft EIR* and *Technical Memo* provide an incomplete and biased representation of the choices that realistically are available to irrigators and the Control Board.

The *Technical Memo* identifies the management practices in the analysis but provides no justification for how the analysts selected these practices.

> "Although a wide variety of management practices could be used to reduce impacts on water quality, this suite [the seven practices selected and listed in Table 2-1] of management practices is deemed sufficient from a programmatic point of view to encompass all flow path and management needs that must be addressed to reduce impacts on water quality." (*Technical Memo* p. 2-2)

The *Technical Memo* provides no assessment of how these practices were "deemed sufficient" for the analysis. More fundamentally, the authors provide no discussion of selection criteria they applied to reach their conclusion. Without this information, the Board, other decision-makers and stakeholders cannot assess the appropriateness of the selected practices. This is especially important given that, as we describe in our critique of adoption costs, the selected practices are some of the most expensive available.

As described in the *Existing Conditions* report, over 100 practices exist with proven potential to improve water quality.

> "This section provides a summary of the management and hardware actions that have been proven to provide a water quality benefit. … The single most comprehensive reference for individual management practices is the NRCS [citation omitted]. This website lists over 100 proven practices, that provide information for physical actions that apply to several of the management measure categories. Although the NRCS guides were developed for general use, they contain sufficient guidance for local implementation." (*Existing Conditions* p. 5-5)

Without information on the "deemed sufficient" selection criteria, the choice of management practices appears arbitrary, and lacks analytical rigor.

The *Technical Memo* also provides no information on the effectiveness of the management practices in the analysis.

> "Management practices were assumed to be 100 percent effective." (*Technical Memo* p. 2-1)

Assuming complete effectiveness strays outside the bounds of rational expectations. The analysts make this assumption without support or citation to relevant studies. The assumption thus appears arbitrary and devoid of analytical veracity.

Given these considerations, the standard analytical approach applicable to the *Draft EIR* and *Technical Memo* would entail describing the full range of options before the Board and their respective consequences. The *Draft EIR* and *Technical Memo* exhibit neither of these characteristics. Consequently, they do not (and cannot) provide a reliable basis for the Board to make decisions that will satisfy its obligations to "preserve, enhance, and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations".[4]

VI. COSTS

The *Technical Memo* incorrectly calculates the costs associated with irrigators adopting practices that reduce their impacts on water quality. The analysis also overlooks major categories of economic costs and benefits that the *Draft EIR* alternatives would affect. Hence, it provides an incomplete, biased representation of the alternatives' overall economic costs.

The *Technical Memo* describes that the management practices in the *Draft EIR* alternatives are "relatively expensive." The report provides no information about the criteria the authors used to reach this judgment, no evaluation of the extent to which the projects included in the *Draft EIR* are more expensive than those excluded from it, and no justification for why those who constructed the alternatives selected the more expensive projects. The inclusion of more expensive projects and exclusion of less expensive ones has an important impact on the economic analysis and biases its conclusions, insofar as the large majority of the acres in the study produce field, forage, grain, and other crops whose value is lower than crops in other categories. By selecting more expensive projects, the analysis also increases the number of acres that growers take out of production as operating costs increase.

> "Some key analytical assumptions and data limitation contributed to the relatively large estimated change in acreage.
>
> "More importantly, management practices assumed to be implemented for the analysis are relatively expensive, especially for lower-revenue crops … As a result, crops such as irrigated pasture, hay, and some small grains would have difficulty supporting such costs. The analysis indicated large reductions in their acreages in the regions where those costs were incurred. "
>
> "Irrigated pasture, hay, and other field corps … accounted for more than 95 percent of the acreage reductions shown in Table 3-7. To the extent growers of these crops could identify less-expensive ways to comply, such as avoiding

[4] California Water Boards web site http://www.swrcb.ca.gov/centralvalley/about_us/water_boards_structure/index.shtml, accessed September 22, 2010.

the use of certain pesticides, the acreage and revenue impacts would be substantially reduced." (*Technical Memo* p. 3-8, 3-9)

"… acreage revenue and net income changes were *relatively sensitive to the implementation cost assumptions*. The same general conclusion applies to the results for all alternatives. If growers can identify and implement more cost-effective methods to comply with ILRP requirements, impacts on production and income can be reduced substantially, especially for lower-value field and forage crops." [emphasis added] (*Technical Memo* p. 3-19)

With this conclusion, the authors, themselves, acknowledge the underlying flaws and biases in the *Technical Memo.* These characteristics render it and its findings unsuitable as a basis for decision-making by the Board, or any other entity.

The analysts who conducted the economic work described in the *Technical Memo* apparently ignored existing models that describe economic outcomes of changes in water quality. The *Guidebook* describes two such models specific to water-quality assessments in California:

"The maintenance of good water quality is an important project objective [and the focus of the study at issue in our critique]. The State Water Resources Control Board (SWRCB) and the Metropolitan Water District of Southern California (MWD) in cooperation with the US Bureau of Reclamation (Bureau) and other agencies have developed economic models to assess the impacts of changes in water quality." (*Guidebook* p. 37)

- SWRCB Lost Beneficial Use Value Calculator estimates the lost benefits attributed to diminished water quality.

- MWD Salinity Economics Impacts Model estimates regional economic impacts of changes in salinity of water sold by the Metropolitan Water District of Southern California. (*Guidebook* p. 37)

The analysis in the *Technical Memo* also overlooks major categories of costs and benefits that the *Draft EIR* alternatives will affect. Given the Board's mission and goals (which we cite above) regarding efficient use of water and protecting beneficial water uses, this omission constitutes a fatal deficiency in the study.

Improving water quality may increase irrigators' costs relative to baseline conditions—though, as we note above, the analysis in the *Technical Memo* grossly overstates these costs—but it will also generate economic benefits for other water users by lowering the costs they incur from water polluted by farm runoff. The current analysis ignores these benefits. For example, improving water quality can reduce filtration costs for downstream users. Recreational-water users, including sport and commercial fishing interests, can also benefit from improved water quality. Board members and other interested parties will find no information in the *Technical Memo* on these economic benefits of the *Draft EIR* alternatives.

Readers can look no further than the Central Valley Region's own Water Quality Control Plan (Plan) for information on the significance of beneficial water uses. Chapter II of the Plan describes these uses.

> "Beneficial uses are critical to water quality management in California. State law defines beneficial uses of California's waters that may be protected against quality degradation to include (and not be limited to) '…domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources of preserves' [citation omitted]. Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning."[5]

The *Technical Memo* provides a biased and incomplete assessment of the economic outcomes of adopting any of the *Draft EIR* alternatives. This is especially true regarding the economic benefits of the alternatives. Consideration of these benefits is essential, given the "primary goal" of water quality planning, as described by the Central Valley Region. Because of these flaws, Board members cannot not rely on the analysis and conclusions in the *Technical Memo* for a balanced, comprehensive, or informed assessment of the relevant economic outcomes of the *Draft EIR* alternatives.

VII. Risk and Uncertainty

The *Technical Memo* provides no information on how each of the five alternatives would affect the risks and uncertainty facing irrigators and others. Economic analyses of the scale and scope described in the *Technical Memo* typically include analyses of risk and uncertainty as a matter of course. The analysts' failure to comply with this generally accepted standard of practice gives decision-makers and stakeholders incomplete descriptions of the economic significance of the alternatives' outcomes.

The *Guidebook* describes the importance of accounting for risk and uncertainty in economic analyses of policies that affect water management.

> "Although it is impossible to account for all sorts of uncertainty and risk in a planning study, there are techniques that can be used to acknowledge their existence and to assign some quantitative importance to them in the analysis. These techniques include …." (*Guidebook*, p. A-17)

The economic analysis described in the *Technical Memo* violates generally accepted standard by not assessing how the *Draft EIR* alternatives affect the risks and uncertainty that irrigators and other water users face.

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[5] California Regional Water Quality Control Board Central Valley Region. 2009. The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region Fourth Edition. Page II-1.00.

VIII. REGIONAL IMPACTS

The *Technical Memo* provides a biased and incomplete description of the regional impacts of the alternatives. The conclusions in this section emphasize negative outcomes and ignore the analytical assumptions that overstate costs and the resulting negative outcomes.

In spite of the fact that the analysis described in the *Technical Memo* overestimates the costs of adopting the alternatives in the ILRP, Alternatives 3, 4, and 5 yield *net positive* impacts on employment and personal income. According to the *Technical Memo*, total personal income and total regional employment would *increase* with the adoption of Alternatives 3, 4, or 5. (*Technical Memo* p. 4-35)

The Conclusions subsection of the Regional Impacts portion of the *Technical Memo* describes reasons why the analysis likely underestimated the net adverse effects of the alternatives, which overstates the positive impacts on employment and personal income. A more balanced summary of this portion of the analysis would also comment on the reasons why the analysis likely overstates—perhaps significantly—the estimated costs of the alternatives.

The analysts present their IMPLAN assessment of regional impacts without disclosing the limitations of these types of multiplier models, or the implications of these limitation for their conclusions. For example, IMPLAN and other input-output models assume a static economy, or an economy that cannot respond to economic forces and trends, e.g., increasing market pressure to improve irrigation efficiency by switching from flood to sprinkler irrigation. In this example, the IMPLAN limitation compound the deficiencies associated with the study's baseline, which we describe above.

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September 27, 2010

Mr. Michael Lozeau
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Subject: Comments on the Draft Program Environmental Impact Report for the Long-term Irrigated Lands Regulatory Program

Dear Mr. Lozeau:

I have reviewed the "Draft Program Environmental Impact Report (PEIR) for the Long-term Irrigated Lands Regulatory Program (ILRP) within the Central Valley Region" ("PEIR") (July 28, 2010). I have also reviewed the "Irrigated Lands Regulatory Program Long-Term Program Development Staff Report (July 2010) and the "Draft Technical Memorandum Concerning the Economic Analysis of the Irrigated Lands Regulatory Program" (July 2010). I have prepared comments on the PEIR that address proposed surface water and groundwater monitoring and management practices.

1. The Alternatives are not Adequately Evaluated

The PEIR does not evaluate the relative effectiveness of the five alternatives in the control of contaminated discharges from agricultural operations in the Central Valley. Furthermore, the PEIR provides no quantitative analysis of the amount of contaminant loading to surface water and groundwater that would result from implementation of the alternatives. These are fundamental flaws of the PEIR that leave the reader with no basis to judge the merits and shortcomings of the alternatives. Because contaminant loads are not quantified, the cumulative impact to water quality cannot be predicted, as discussed in Comment (2) below. Finally, the PEIR fails to provide a basis to determine best practicable control or technology (BPTC) as required by Resolution No. 68-16 (Oct. 28, 1968).

Our brief qualitative analysis of the alternatives is as follows.

Alternative 1, because it is the status quo would fail to reduce contaminant loads and improve water quality and, because it relies on regional or watershed scale monitoring, would not allow for a determination of BPTC. To determine BPTC, monitoring and data comparison is necessary upgradient and downgradient of points of control, i.e., where measures are implemented in the field. Because of the reliance on current management practices and because only regional monitoring is to be used, Alternative 1would not result in measureable improvement to water quality and in fact foster further degradation of water quality.

Alternative 2, which includes some groundwater management practices, would not demonstrably reduce contaminant loads and improve water quality. The groundwater management practices include only token wellhead protection measures involve only the placement of dirt in berms adjacent to the wellhead to prevent movement of surface water to the wellhead. These minor improvements are already required under Title 3, California Code of Regulations Division 6 (effective May 27, 2004) for areas where pesticides are mixed, rinsed and stored. (http://www.cdpr.ca.gov/docs/emon/grndwtr/gwregsinfo0702.pdf) Implementation of these measures more broadly, i.e., at all farms, is not likely to result in significant water quality gains because the berms would only marginally protect against pesticide and nitrate transport in stormwater in the areas where wellheads are located and would not address subsurface transport of pesticides and nitrates.

No farm-scale monitoring requirements are included under Alternative 2 and therefore, a determination of BPTC is not possible. Because only token wellhead protection measures are to be undertaken, Alternative 2, like Alternative 1, would not result in measureable water quality improvements and may be just as likely to result in water quality degradation.

Alternative 3 requires farm plans that use a tiered approach to address water quality concerns. This alternative is an improvement and may result in some gains in water quality; however, because no surface water or groundwater monitoring is required, the implementation of this alternative would not result in measureable improvement to water quality and the lack of monitoring does not allow for BPTC determinations.

Alternative 4 provides for nutrient management and regional or individual monitoring under a tiered hierarchy. Whereas use of tiering is acceptable in determining the intensity of monitoring, the option to participate in regional scale monitoring would not allow for the determination of BMP effectiveness nor BPTC. Costs under Alternative 4 could also be reduced by incorporating groundwater quality information from public water supply systems into a database to compliment the data obtained from Tier 2 and Tier 3 farms that would be required to participate in regional groundwater monitoring. As with Alternative 3, Alternative 4 may provide some gains in water quality; however, those gains would not be measurable because only regional monitoring is required.

Alternative 5 requires surface water and groundwater monitoring at individual farms and would likely be most protective of water quality. Because discharger-scale monitoring

would be required, BMP effectiveness could be evaluated and a determination of BPTC could be made. As monitoring data from BMPs are evaluated, BPTC can be determined and deployed in the field.

The monitoring under this alternative, however, is duplicitous and overly burdensome. Instead, use of a tiering scheme (i.e., to reduce monitoring at low risk farms in low risk environments) would reduce costs as would better coordination between farms in fulfilling monitoring requirements. For example, if groundwater wells were to be installed, groundwater monitoring at neighboring farms could be coordinated with one farm's downgradient well serving as the adjacent farm's upgradient location. Alternative 5, while inefficient, would result in the greatest potential for water quality gains because of the monitoring that would be required at farms.

To properly evaluate the five alternatives, a quantitative estimate of the contaminant loads to surface water and groundwater needs to be integrated into Chapter 3 of the PEIR, Program Description. Additionally, consideration of each alternative's capability to meet BPTC needs to be incorporated into Chapter 3, including specification of monitoring at a scale that allows for the determination of BPTC.

2. Cumulative Impacts on Downstream Ecologic Receptors are not Assessed

The PEIR fails to consider cumulative impacts of the alternatives on ecologic receptors downstream of the agricultural discharges in the Central Valley, namely the Delta and the San Francisco Bay and Estuary. Wildlife in the Delta and the Bay at risk include, for example, special-status fish species such as the Delta Smelt and anadromous fish such as Chinook Salmon and Steelhead Trout. Clearly, contaminant loading of pesticides and nutrients to upstream waters impacts habitat for these fish and their prey yet no consideration of these or any individual species is given in Section 6, Cumulative and Growth-Inducing Impacts. The PEIR states only in Chapter 6:

> Because many of the existing effects discussed in the section "Existing Effects of Impaired Water Quality on Fish" are cumulative, it is difficult to determine the relative contribution of irrigated lands and other sources. For example, low DO in the Stockton Deepwater Ship Channel is a result of contamination from upstream nonpoint sources (possibly including agricultural runoff) and discharges from the Stockton sewage treatment plant (Lehman et al. 2004; Central Valley Water Board 2005). Application of pesticides to non-agricultural lands such as urban parks and the resultant contaminant runoff also cumulatively contribute to impacts of inputs from irrigated lands.

This level of analysis is insufficient and provides no basis for comparison of the cumulative impacts that would result from the five alternatives. Section 6 should be re-written to estimate and incorporate contaminant loads from agricultural practices on irrigated lands to both surface water and groundwater under each alternative. The contaminant loads should be compared to other contaminant loads (other agricultural operations (e.g, dairies) and industrial discharge (e.g., treated sewage discharges) that are

contributed to downstream water bodies, including the Delta and the San Francisco Bay, to predict cumulative impacts from Central Valley irrigated agricultural operations.

Cumulative effects are essential to consider, given the impact of poor water quality on downstream ecologic receptors. For example, pelagic organisms such as the delta smelt are in decline in the upper San Francisco Estuary. The decline is not only because of direct smelt mortality from entrainment at pump intakes but also because of exposure of smelt and smelt prey to toxics and nitrogen. (http://www.sciencedaily.com/releases/2010/05/100517161144.htm and http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/pelagic_organism/docs/pod_ieppodmt_2007synthesis_011508.pdf) Studies have also shown that contaminants, including pesticides, have been linked to the decline of striped bass in the Upper Sacramento River http://www.sciencedaily.com/releases/2008/12/081209100940.htm. Cumulative impacts are also important to consider in the decline of anadromous fish, where contaminants are one factor contributing to significant population reductions (see, for example PEIR p. 5.8-20)

Cumulative impacts are also important to consider in impacts on recreation. For example, the growth of water hyacinth (Eichhornia crassipes) in the Sacramento-San Joaquin River Delta as a result of increased nutrient loads (nitrogen and phosphorus). (http://www.dbw.ca.gov/PDF/Egeria/WHSciProbsExcerpts.pdf) The rapid growth of water hyacinth has resulted in impacts to boating and recreational use by impeding waterway navigation and swimming.

Despite these and other well-known and significant impacts, the PEIR fails to discuss cumulative impacts to water quality, fisheries, and recreation from implementation of the five alternatives. The failure to consider cumulative impacts stems from the fact that contaminant and nutrient loads were not quantified in the PEIR, by alternative, as noted in Comment 1. The PEIR needs to conduct a thorough assessment of cumulative impacts that will include consideration of contaminant contributions from irrigated agricultural lands to surface water and groundwater under each alternative.

3. Surface Water Monitoring Required under Alternatives 4 and 5 is Vague

The PEIR lacks fundamental detail regarding those alternatives where farm-scale surface water monitoring may be conducted (i.e., Alternatives 4 and 5). The PEIR describes Tier 2 and Tier 3 monitoring for Alternative 4 as follows (p. 3-19):

> Tier 2: Individual tailwater, stormwater, tile drainage monitoring for constituents of concern 1 year of every 5 years
>
> Tier 3: Individual tailwater, stormwater, tile drainage monitoring for constituents of concern

The PEIR describes surface water monitoring under Alternative 5 as follows:

Under Alternative 5, each operation would be required to conduct the following monitoring and tracking for each field and submit the results to the Central Valley Water Board annually.

- Discharge monitoring for constituents of concern
- Tailwater discharges monthly.
- Storm water discharges during the first event of the wet season (between October 1 and May 31) and once during the peak storm season (typically February).
- Discharges of subsurface (tile) drainage systems annually. (PEIR, p. 3-28)

The PEIR is vague on how surface water monitoring practices and resultant data would be reviewed stating only that the Regional Board would review and approve monitoring plans of third parties and legal entities and would review monitoring reports (PEIR, p. 3-21). The PEIR does not specify criteria that would define acceptable practices for monitoring including use of appropriate QA/QC, use of state-certified laboratories, methodology for selection of constituents of concern, and required locations for stormwater sampling (i.e., upgradient/downgradient, pre- and post BMP). We understand the PEIR is a programmatic EIR; however, some level of detail is needed in a revised PEIR to evaluate the effectiveness of the farm-scale surface water monitoring that is proposed in Alternatives 4 and 5.

4. Public Health Impacts from Exposure to Contaminated Groundwater is not Considered

More than two million Californians have been exposed to harmful levels of nitrates in drinking water over the past 15 years and the population of those exposed keeps growing. The PEIR acknowledges the extent of nitrate contamination and includes, as Figure 5.9-17, a map that shows nitrate contamination to be concentrated in the Central Valley. Incredibly, however, the PEIR makes no attempt analyze how nitrogen-based fertilizer application in the Central Valley results in significant exposure of the public to contaminated groundwater, the health impacts of that exposure, or how implementation of any of the five alternatives would reduce or increase exposure, other than to say, for Alternative 1:

> Nutrient management would improve both surface water quality and groundwater quality by improving the use of chemicals and using improved application techniques, and by limiting the use of nutrients as fertilizer that could potentially seep to groundwater and add nitrate to the groundwater table. (PEIR, p. 5.9-14)

The assertion that ongoing nutrient management efforts would somehow improve water quality is not borne out by recent data. In fact, the status quo, as proposed in Alternative 1, has resulted in an increase, statewide, in the number of wells that exceeded the health limit for nitrates, from nine in 1980 to 648 by 2007. (http://articles.sfgate.com/2010-05-17/news/20901575_1_nitrate-contamination-water-supply-water-systems) Of 13,153 wells sampled statewide, 1,077 active and standby drinking water wells have

concentrations of nitrate above the drinking water standard of 45 mg/L. (http://www.swrcb.ca.gov/water_issues/programs/gama/docs/coc_nitrate.pdf) In Tulare County, more than 40% of private domestic water wells exceed the drinking water standard for nitrate and statewide, the majority of nitrate exceedences appear to be in the Central Valley. (http://www.swrcb.ca.gov/gama/docs/ekdahl_gra2009.pdf) On the basis of more than 25 years of data, the number of wells that exceed the drinking water standard for nitrate is growing as a percentage of all nitrate detections. (http://www.swrcb.ca.gov/gama/docs/ekdahl_gra2009.pdf) Clearly the status quo is not working and implementation of Alternatives 1 and 2 would likely lead for further increases in nitrate drinking water violations in the Central Valley.

Health effects of exposure to nitrates most notably results in methemoglobinemia or "blue baby syndrome." Toxic effects of methemoglobinemia occur when bacteria in the infant stomach convert nitrate to more toxic nitrite, a process that interferes with the body's ability to carry oxygen to body tissues. Infants with these symptoms need immediate medical care since the condition can lead to coma and eventually death. Pregnant women are susceptible to methemoglobinemia and should be sure that the nitrate concentrations in their drinking water are at safe levels. Additionally, some scientific studies suggest a linkage between high nitrate levels in drinking water with birth defects and certain types of cancer. (http://www.swrcb.ca.gov/water_issues/programs/gama/docs/coc_nitrate.pdf)

The PEIR should be rewritten to include an assessment of the potential for the public to be exposed to nitrates in drinking water from agricultural practices in the Central Valley. The assessment of each alternative should include an estimate of nitrogen loading to fields; nitrogen fate and transport in soil, surface water, and groundwater; nitrogen monitoring; and a summary nitrogen impacts to water supplies. Linking monitoring to measurement of each of the alternatives is critical. An annual assessment of the performance of the alternative that is selected should be required and use of the 13,000-well California Department of Public Health database should be required as a tool for evaluation of nitrate trends.

Sincerely,

Matt Hagemann, P.G.

Steven Bond and Associates
Consulting Geologists, Groundwater and Water Quality Experts
P.O. Box 7023, Santa Cruz, CA 95061 v:(831) 458-1662, f:(831) 536-1021 bondassociates@mac.com

27 September 2010

Bill Jennings, Executive Director
California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, CA 95204

Subject: Monitoring Requirements for Compliance with the Irrigated Lands Regulatory Program.

You've asked me my opinion in the form of several questions about water quality monitoring. These questions are within the context of the irrigated lands regulatory program that deals with farmland and the water runoff from these lands into receiving waters in the State of California.

I am a professional geologist specializing in water chemistry, water quality, groundwater, and engineering geology. I hold professional licenses and certifications issued by the State of California for these practices, and operate a private consulting business providing these services. I have more than twenty-five years experience evaluating natural and contaminant water chemistry problems and issues. Eleven of those years were working for the California State Regional Water Quality Control Board on water quality issues related to the impacts and remedies of water pollution from industrial and cultural activities. My experience includes the development, preparation, and review of hundreds of water quality monitoring programs involving surface water as well as groundwater systems. A true and correct copy of my curriculum vita is attached.

You asked if it is possible to protect the beneficial uses of waters of the State without monitoring those waters. The answer is a simple no. Protection of beneficial uses of waters of the State is function of the ability to monitor those waters to determine their quality. This done to verify their conformity to water quality standards and goals as defined in the Basin Plan.

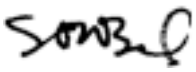
You asked if it was possible to evaluate the effectiveness of a water treatment system or of a management practice at a farm without monitoring the discharge. My answer is no. Evaluating the effectiveness of a technology or a practice requires that the change in water quality attributable to the specific practice or technology be verified. To do that a reference sample from the point of discharge and then a comparison sample taken from the same location after the technology or practice is implemented must be collected and analyzed. In actual practice, multiple samples over range of operating conditions must be collected to verify positive changes.

You also asked if it was possible to evaluate the effectiveness of a water treatment system or of a management practice at a farm from a distant downstream monitoring location. The basic answer is no. In such a case, before the samples are collected, the discharge is mixed and diluted in the receiving water with other sources of pollution from other farms. Any changes in water quality that may occur at the discharge are masked within this soup of waters and pollution and the performance of the technology or practice are essentially unknowable.

You asked if the downstream water quality of a complex watershed composed of multiple sub-watersheds, is a valid measure of the water quality in any or all of the individual sub-watersheds. My answer is no. While gross average conditions may be observed downstream, the conditions of individual upstream sub-watersheds will remain unknown. Between the downstream monitoring station and the various upstream watersheds, mixing and dilution occurs and the conditions at any upstream point are obscure to the downstream location.

I've attached a 26 May 2003 letter from me to the Chairman of Central Valley Regional Water Quality Control Board on the subject of the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region. This letter also addresses many of the issues associated with water quality monitoring of irrigated lands.

Sincerely



Steve Bond PG, CEG, CHG
Principal, Steven Bond and Associates

Attachments

Steven Bond and Associates, Inc.
Consulting Geologists, Groundwater, and Water Quality Experts
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26 May 2003

Mr. Robert Schneider
Chairman, Central Valley Regional Water Quality Control Board
3443 Routier Road, Suite A
Sacramento, CA 95827-3003

Subject: Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region, 24 April 2003

Chairman Schneider and Members of the Board.

I have reviewed the proposed Monitoring and Reporting Programs (MRP) for the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region which was prepared for the 24 April 2003 Regional Board hearing. I prepared this letter on 23 May 2003 but was unable to transmit because I lacked various information available only on the Regional Water Quality Control Board Web Site, which was unavailable at that time. I was informed today that the deadline for comments was extended due to technical problems with that web site. I am submitting this letter on behalf of the DeltaKeeper and Water Keepers of Northern California.

I find that the proposed MRP and associated Quality Assurance Project Plan are impressive documents with many positive elements to offer for the protection of water quality. However, in certain respects the proposed MRP is too general and provides loop holes that may result in less than adequate monitoring data.

I am a professional geologist specializing in water chemistry, water quality, groundwater, and engineering geology. I hold professional licenses and certifications issued by the State of California for these practices, and operate a private consulting business providing these services. I have eighteen years experience evaluating natural and contaminant water chemistry problems and issues. Eleven of those years were working for the California State Regional Water Quality Control Board on water quality issues related to the impacts and remedies of water pollution from industrial and cultural activities. My experience includes the development, preparation, and review of hundreds of water quality monitoring programs involving surface water as

well as groundwater systems. A true and correct copy of my curriculum vita is attached.

The decades of growth and development of the Central Valley and its agricultural industry has coincided with the decline of the quality of the Central Valley waterways. Although this decline is a matter of record, discharges and runoff from irrigated agriculture and other agricultural operations have contributed to this decline in ways that are often difficult to quantify. They are not easily quantified because because critical monitoring programs were not in place to require the collection of essential data.

Water Quality Monitoring Fundamentals

Monitoring is the central supporting element of water quality protection and conservation. All actions to protect and safeguard our water resources rely on what the monitoring informs us about the conditions of the water bodies. Monitoring programs are like the physical senses; they are the faculties which we perceive the conditions of the water bodies. Without monitoring, we are blind to all but the grossest conditions in our rivers, streams, and lakes. Further, a poor or inadequate monitoring program provides us with questionable information and ambiguous clues to guide us in making intelligent decisions regarding water quality control.

A valid monitoring program usually begins as a well-reasoned plan. It will include an assessment of water flow onto and off of an area of possible or potential pollution, and contaminants. It will include an assessment of all the potential sources of pollution and contamination and identify the elements and constituents associated with the sources. The elements can include individual constituents as well as possible adverse effects of combinations of individual constituents and or conditions. These effects will be measured as toxicity. The well-reasoned plan will address the representativeness of sample collection by the method and timing of sample collection and measurement.

A well-reasoned water-quality monitoring plan is based on a thorough understanding of flow paths and physical and chemical quality of the water moving through a watershed. This will include an understanding of the variability of the flow and quality of the water over time, and at different locations within the watershed. This understanding of the watershed becomes the standard by which subsequent monitoring data can be measured or judged. Definition of existing conditions within a

watershed will require, at a minimum, the monitoring of a full annual cycle of climatic changes. However, multiple years of data are needed to address variations in the annual cycles.

A good understanding of a watershed (existing-conditions) is highly desirable; it is usually essential. Lacking good understanding of the existing-conditions, the only option left is to measure the quantity and quality of water before (background) it enters the critical area of the watershed (project area), and then conduct identical monitoring of water as it passes from the project area. In this latter case, the background water quality becomes the standard, or benchmark which the down-river water quality can be measured and judged.

Monitoring Point Locations

Valid monitoring data can only be collected from logical points of monitoring placed within the flow path of the discharges from the potential sources of pollution (the agricultural lands) into the receiving waters; the waters of the State.

Monitoring Parameters

A reasonable water-quality monitoring program will track physical and chemical constituents of interest (constituents of concern) specific to the discharge from a source and, will define the mass of contaminants discharging from the source. The constituents of concern will include each constituent reasonably expected to come from the agricultural operation. Constituents of concern will also have the potential to impair the beneficial uses of the receiving waters, or they will be indicators or surrogates of such pollutants.

Sample Collection Timing

Sample collection must coincide with the most likely period of time that discharge of pollutants would occur. In many cases pesticide and fertilizer application occurs only at certain times of the year and these times vary depending on the crop. Consequently a valid plan will address these variables.

Monitoring Cost Estimates

A wide range of alternative technologies exist to assist the responsible parties in efficient and cost conscious data collection. When attempting to assign a dollar cost to monitoring project, it is not reasonable to assume the that the most labor intensive sampling and analytical techniques should be used.

Monitoring Station versus Watershed Area

The proposed MRP is excessively lenient where it indicates that 20 square kilometers (5000 acres) of watershed will be a maximum area allotted per monitoring point. This language will tend to encourage dischargers to design monitoring plans around this figure and in doing so will undermine the quality of monitoring data.

For example, a monitoring plan with a large watershed and few monitoring points will inevitably have a number of small tributary water bodies located between a single monitoring point and a potential source of pollution. These small tributaries will alter the character and quality of the water and the sampled water will not be representative of the water quality impairment immediately down stream of a particular discharge. Such a program will deliver misleading and incomplete information with respect to receiving-water water quality conditions. This will result in contradictory or ambiguous conclusions with respect to the performance of any mitigation measures, or lack thereof, at the project area.

Emphasis should be placed on the requirement that each discharge point be monitored and that each sample collected be representative of the discharge water quality. The size of an area represented by a monitoring station should be a function of the number of discharges from a specific agricultural operation.

Summary

An adequate monitoring program is a valid program. It will assess the impacts to the state's waters from agricultural operations and it will require monitoring stations at the point(s) of discharge. A valid monitoring program will monitor for all constituents of concern as well as toxicity. It will assess the total mass of pollutants discharging from individual agricultural operations and it will also include a comprehensive ambient (background) monitoring program.

Sincerely

Steve Bond
Principal, Steven Bond and Associates, Inc.

Attachment

STEVEN R. BOND

Curriculum Vita

P. O. Box 7023
Santa Cruz California, USA 95061
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bondassociates@mac.com

Profile

Geologist / Engineering Geologist / Hydrogeologist / Aqueous-geochemist /

- More than twenty-five years applied experience in groundwater and engineering geology.
- Twenty years practical experience defining hydrogeologic flow systems in crystalline, fractured rock systems, and porous sedimentary aquifers.
- More than twenty years practical experience evaluating natural and contaminant water chemistry problems and issues.
- Eighteen years applying geochemical techniques to hydrogeologic situations in humid, and semiarid hydrogeologic regimes, including water supply, and contaminant fate and transport analyses.
- More than twenty years experience investigating and evaluating geologic and hydrogeologic hazards related to slope stability, seismic hazards, hazardous materials, mine wastes, and soil and groundwater contamination.
- Five years experience defining and modeling stream and river flow, flooding analyses, and sediment transport systems.
- Ten years experience evaluating industrial impacts to water quality

Professional Licenses	Registered Geologist, *California, USA*	# 5411
	Certified Engineering Geologist, *California, USA*	# 1841
	Certified Hydrogeologist, *California, USA*	# 0238

- Eleven years regulatory experience implementing California and U. S. water quality laws and regulations.

Professional Experience

January 1999 to Present

Steven Bond and Associates, Santa Cruz, CA, President, Principal Geologist

Conducted investigations and assessments of geologic hazards, threats to surface water and groundwater quality from various industrial and natural sources, and groundwater supply investigations. Performed litigation support in cases involving potential impacts of geologic hazards, groundwater supply and pollution, surface water pollution, and State water quality policy review. Examples of such activities and projects include the following:

- *Engineering Geology*: Conducted investigations of geologic hazards, foundation studies, liquefaction potential assessments, fault trace analyses, slope stability assessments and prepared the associated engineering geology investigation reports for development and industrial projects in Monterey, San Mateo, Mendocino, and Santa Cruz Counties. ◊ Conducted foundation suitability study, seismic evaluation, and fault trace study for resort development, Big Sur (Monterey Co.) ◊ Conducted analysis of debris-slide hazard potential of properties near Loma Mar (San Mateo Co.) ◊ Did technical analysis of slope stability and soil erosion potential of timber harvest operations, and evaluated surface-water monitoring practices (Humboldt Co.) for permitting dispute. ◊ Evaluated landslide activation hazard analysis of cliff side development in Brisbane (San Mateo Co.) ◊ Evaluated potential erosion hazards and drafted technical remedies from impacts of extrajudicial logging activities (Mendocino, Co.) ◊ Prepared engineering geologic reports for various residential development projects (Santa Cruz Co. , San Mateo Co.).
- *Groundwater Investigations, Modeling, and Remediation System Design:* Designed and implemented original subsurface investigation technics, and remediation systems for a complex hydrogeologic environment of

volcanic sediments, for Sierra Nevada Mt. community drinking water contamination (Volcano, CA). ◊ Did aquifer analysis and computer simulation (Modflow) of contaminant flow and remediation system design (groundwater extraction) for MTBE site in Turlock, CA. ◊ Did groundwater transport and pollutant fate analysis of landfill for litigation support. (Colma, CA)

- *Groundwater Supply:* Conducted groundwater use sustainability study for Sonoma Valley winery (Valley of the Moon). ◊ Did evaluation of sustainability potential and impacts from groundwater extraction in Sierra Valley (Sierra and Plumas Counties) for litigation support.
- *Policy Review and Regional Studies:* Conducted technical review and analysis of CA State water policy (State Implementation Plan, California Toxics Rule) for litigation support. ◊ Technical consultant and committee member for San Francisco Bay Copper-Nickel TMDL impairment studies (north and south).
- *Storm Water:* Conducted technical reviews, and did litigation support in cases of storm water pollution regarding the adequacy of monitoring programs, BMPs, and treatment technology application (Alameda, Humboldt, Placer, Sacramento, San Joaquin, San Mateo, San Francisco, Sonoma, Yuba counties) for the following types of industry: aggregate, cement, asphalt, metal fabrication, metal forging, steel casting, recycling, ship breaking, wood treatment, sawmills, CAFOs, vehicle maintenance, auto wrecking, POTW, precious and heavy metal mines, landfills, fueling facilities, and port loading facilities for ammonia, fertilizer and petroleum coke.
- *Mining Projects:* Evaluated drinking water quality hazards posed to confined prisoners at an operating copper mine (United Nations ICTY, Bosnia-Herzegovina). ◊ Evaluated geochemical potential to produce acid and release arsenic from re-activated gold mine (Sutter Ck. CA), acid mine drainage water quality impacts. ◊ Evaluated WQ pollution potential from abandoned mercury and gold mines (Coastal Mts, central & north CA, Sierra Nev. Mts) for litigation purposes.
- *Land Discharge Projects:* Evaluated compliance with CCR Title 23, Title 22, Chapter 15 (CA) regulations for Winery wastes (Amador County), dredging spoils disposal (Port of Stockton), Class III landfill (San Mateo Co., Shasta Co., Lake Co.). Designed monitoring programs and budgets.

March 1998 - January 1999

Fall Creek Engineering, Inc., Santa Cruz, CA, Principal Geologist

Evaluated the risk from surface and groundwater contamination to public groundwater supplies (Big Sur); performed computer simulations of flow and geochemistry of ground and surface water interaction using Modflow, Minteq. Did hydrologic studies to evaluate the flood stages, water surface profiles, and erosion potentials; constructed a computer -based hydraulic model of the river using HEC-RAS (Salinas River, Monterey Co.); prepared water quality and flood control management plans (Pajaro River). Designed and conducted soil and groundwater sampling analysis programs at various sites in Monterey and Santa Cruz Counties (leaky underground fuel tanks, wastewater disposal systems).

March 1997 - January 1998

Water For People, Denver Colorado, Consulting Hydrogeologist

Conducted a synoptic hydrogeological survey of the Bay Islands, Honduras, Central America for the Bay Island Environmental Project. Conducted a study of the islands' resources and made recommendations for a comprehensive water supply investigation of the three main islands comprised primarily of fractured metamorphic rock. Conducted local interviews, literature review and a reconnaissance level survey, field trued geology in selected areas. Evaluated island-available drilling technology, characterized water quality and supply issues for several of the island communities, prepared investigative criteria for future work, wrote report.

December 1986 - May 1998

California Regional Water Quality Control Board, Sacramento, CA. Associate Engineering Geologist

Conducted investigations of all aspects of pollutant transport in the vadose zone and groundwater and surface water. Reviewed and evaluated the geologic, hydrogeologic, geochemical, and geophysical content of professional reports. Evaluated thoroughness of surface and groundwater investigations, the completeness of remedial efforts, and validity of monitoring programs. Provided expert technical assistance to State and local agen-

cies on issues of geochemical fate and transport of pollutants, well-head protection strategies, abandoned mine investigation and remediation methods, and contaminated groundwater and soil cleanup technics. Examples of such projects include the following:

- Analysis of groundwater impacts from organic solvents and fuels in sedimentary and fractured rock terrain. Evaluated investigative methods including drilling techniques, soil, water, and vapor sampling methods, and in situ and ex-situ remedial technologies using vapor transport, groundwater capture, extraction and treatment. Did deterministic computer modeling. Technical advisor and regulator for hundreds of facilities under authority of Federal and State underground tank statutes in the counties of Alpine, Amador, El Dorado, Calaveras, Lake, Napa, Mariposa, Placer, Sierra, Solano, Stanislaus, and Tuolumne California, and in Yosemite National Park.
- Analysis of groundwater flow and pollutant transport characteristics of polluted, high density waste water (industrial acids and heavy-metals) at Davis, CA. Evaluated water quality impacts, effectiveness of groundwater extraction schemes using numerical modeling methodologies for flow, and chemical fate and transport. Co-developed in situ leaching methods of contaminated soils to accelerate cleanup rates.
- Analysis of the underlying, geochemical causes of acid mine drainage at the Penn Mine in Calaveras Co., CA. Identified and evaluated groundwater flow paths in a faulted crystalline-rock aquifer and the applicability of water quality and hazardous waste laws to the toxic discharges. Conducted a geologic and fracture mapping project and developed conceptual flow groundwater model. Evaluated acid-mine and acid-rock drainage remedial alternatives and made recommendations for their use. Developed and composed work plan for the investigation of fractured-rock hydrogeological transport, and aquatic geochemical fate of heavy metals from Penn Mine to the adjacent Camanche reservoir. Authored numerous reports and a series of successful grant proposals, prepared annual budget and obtained funding for detailed groundwater and remedial waste rock investigations.
- In companion project to the above mine waste project, developed a conceptual model for the transport mechanisms of heavy-metal laden sediment in the Camanche water-supply reservoir, developed the conceptual methodology of investigation, and managed the project. Assembled a team of limnologists from the University of California at Davis and fluid mechanical engineers specializing in sediment resuspension from University of California at Santa Barbara. Wrote a successful Federal Clean Lakes Grant proposal, and implemented the investigation at Camanche reservoir, California.

May 1986 - September 1986

U.S. Army Corps of Engineers, Sacramento, California, Engineering Geologist.

Conducted geologic and hydrogeologic investigations preparatory to the design of Deer Creek Water Supply Reservoir, Utah. Drafted groundwater investigation plan. Conducted geologic mapping. Designed monitoring wells, supervised drilling crews and well construction, conducted aquifer pumping tests.

October 1983 - September 1984

Dames and Moore, Los Angeles, California, Sedimentary Petrologist.

Conducted sedimentological investigation of near-shore sediments in western Arabian Gulf. Characterized sediment transport systems in the Arabian Gulf area of United Arab Emirates for Abu Dabi National Oil Company.

May 1982 - April 1983

U.S. Army Corps of Engineers, Portland, Oregon, Engineering Geologist.

Conducted geologic, geophysical and hydrogeologic investigations in the Columbia Gorge near Bonneville, Oregon. Conducted geophysical borehole investigation of Bonneville New Navigation Lock. Did detailed mapping of landslides, and drill core logging. Designed passive de-watering systems, and monitoring wells. Supervised drilling crews and the construction of water supply wells and monitoring wells; conducted and interpreted aquifer pumping tests.

June 1981 - December 1981

XCO, Denver Colorado, Petroleum Field Geologist (Mud logger)

Did drill core logging, conducted field screening of chemical composition of drill cores, interpreted geologic strata, and prepared drilling reports in several depositional basins in North Dakota, Colorado, and Oklahoma.

September 1976 - September 1977

U. S. Geological Survey, Menlo Park, California. Geologic Field Assistant.

Conducted geologic mapping and did geochemical sampling for Continentally Unified Strategic Assessment Program.

Education & Training

Master of Science (ABT) in Hydrogeology, Special Studies Program, California State University, Chico, California, 1985-1986

Bachelor of Arts in Geology, Humboldt State University , California, 1979 - 1981

Annual NWWA courses in Aqueous Geochemistry, Fluid Flow through Fractured Rock, In situ Fluid Extraction Systems, Ground-Water Isotope Geochemistry. 1987-1991.

Computer Modeling. EPA CEAM: MINTEQ geochemical speciation, 1990, 1991; WASP surface water flow and transport, 1991. General Sciences Corp.: SESOIL vadose zone pollutant transport, 1994, 1996; AT 123D groundwater pollutant transport, 1994, 1996; NWWA: Visual Modflow, Flowtrans, groundwater flow and transport, 1996. WHI: Modflow 2000, MTD3, groundwater and contaminant transport, 2002.

Constructed Wetlands Workshop and Seminar Series, Humboldt State University, California, 2002.

Soil Slope Stabilization, Embankment Design, National Highway Institute, Vail, CO, 2007

40 hour OSHA Health and Safety for Hazardous Waste Operations and serial 8 hour refresher courses.

Evaluated economic potential of proposed Federal Wilderness areas and abandoned mines including the Kalmiopsis Wilderness of southwestern Oregon; an ophiolite suite and recent volcanic terrain.

Professional Associations

Association of Engineering Geologists; Groundwater Resources Association of California
Northern California MTBE and Fuel Oxygenates Committee

Non-Profit Affiliations

Valley Air Trust, Central Valley, Stockton California, Board Member 1993 - 1997
BayKeeper San Francisco Bay -Sacramento Delta, Technical Advisory Committee Member 1996 - present.
California Sportfishing Protection Alliance, Technical Advisory Committee Member 2000 - present
The Abandoned Mine Alliance, Sierra City, California, Board Member 2005 - present

Expert Testimony

- Before the United States Northern District of California Court, on issues of storm water pollutants associated with industrial ammonia and urea fertilizer production and storage operations in the case of California Sport Fishing Protection Alliance vs California Ammonia Company, September 2006.

Expert Testimony cont.

- Before the United States Northern District of California Court, on issues of surface water pollution associated with logging practices in the case of EPIC vs Pacific Lumber Company, May 2006.
- Before the United States Northern District of California Court, on issues of groundwater and storm water pollution associated with lumber milling and wood treatment operations in the case of Ecological Rights Foundation vs Sierra Pacific Industries, April, October, 2002.
- Before the United States Eastern California District Court, on issues of storm water pollution, confined animal feeding operations and industrial activities in the case of WaterKeeper of Northern CA. vs L. Vandhoef, Chancellor, University of California, Davis, June, August 2001.
- Before the CA State Water Resources Control Board hearing on the Appeal of Regional Water Quality Board's Actions regarding Pacific Lumber and the Elk Creek Timber Harvest Monitoring, July 2001.
- Before the United States Northern District of California Court, on issues of storm water pollution and ship-breaking in the case of WaterKeepers of Northern CA. et al, vs U.S. Dept. of Navy and Astoria Metals Corporation, June, August 2000.
- Before the California Superior Court on issues of groundwater pollution and crude oil in the case of Thompson Chevrolet vs Chevron Corporation et al., January, July, and November 1996.
- Before the California Superior Court on issues of acid mine drainage, water pollution, and groundwater flow through fractured crystalline rock in the case of California Sportfishing Protection Alliance vs State Water Resources Control Board, June 1994.
- Before the California Senate Natural Resource and Wildlife Committee Investigative Hearing on Conflicts of Interest in the California Environmental Regulatory System, June 1992.
- Before the California Senate Natural Resource and Wildlife Committee Investigative Hearing on Acid Mine Drainage, Water Pollution, and the California Regulatory Environment, Jan. 1992.
- Before the California State Water Resources Control Board hearing on the Appeal of Regional Water Quality Boards Actions regarding the Penn Mine, October 1991.

Public Speaking and Presentations

Presentations before the State Water Resources and Regional Water Quality Control Boards.

- Presented testimony and briefs before the State and Regional Boards on specific cases of regulatory enforcement actions, (1990 - 2007)
- Mediator of formal discussions regarding disputed technical issues about groundwater quality between responsible parties, (1988 - 1998)

Workshop Presentations before professional societies, and local and State regulatory agencies:

- The application and interpretation of discreet groundwater sampling methods and data collection.
- The use and interpretation of computer modeling simulations for vadose transport and mineral equilibria
- The effects and determination of vertical gradients on pollutant transport in groundwater.
- Contaminated soil cleanup criteria based on California State Water Code, regulations and policies.
- Acid Mine Drainage issues: the geology, mineralogy, and chemistry, the environmental effects, remediation, policies, and politics.

Writings

Author of scores of reports for private organizations, NGO's, Federal, State and local Agencies, on the subjects of (a. organic and inorganic pollutant transport in surface and groundwaters, (b. polluted groundwater remediation, (c. the investigation and analysis of the potential transport of soil contamination (metals, fuels, solvents) through the vadose zone, (d. unsaturated zone characterization including vapor-phase transport and cleanup technologies, (e. acid mine drainage causes, fate, and mitigation, (f. the logical elements of water quality monitoring, (g. regulatory compliance of state and federal environmental laws by federal, state and private parties, (h. metal mobility and mineral equilibria, (i. net-vertical transport of groundwater pollutants, (j. general surface water and groundwater resource protection, (k. water budget accounting in mixed geologic environments with multiple density fluid interfaces, (l. groundwater supply evaluations, (m. reconciliation of threats to water resources and risks to human health, (n. engineering geology, geological hazard analysis.

EDWARD MACMULLAN

M.S. Agricultural Economics and International Agricultural Development, University of California at Davis
B.S. Soil Science, Oregon State University

Edward MacMullan has been a senior economist with ECONorthwest since 1990. His areas of experience include litigation support for antitrust, intellectual property, right-of-way, and healthcare topics, and assessing the economic effects of public policies that affect natural-resource management. Before joining ECONorthwest he studied as a Fulbright Scholar at the Energy Studies Unit of the University of Strathclyde where he assessed the socioeconomic impacts of energy development projects in the highlands and islands of Scotland.

His recent consulting and litigation-support work includes calculating restoration costs at mining Superfund sites, assessing alleged anti-trust behavior in markets for hospital and health-care services, reviewing the literature on the economics of Low-Impact Development, conducting an economic benefit-cost analysis of greenroofs, assessing the economic effects of violations of trade secrets on manufacturing firms; studying the impacts of approving a hospital's Certificate-of-Need application on market concentration; evaluating municipal right-of-way fees challenged by telecommunications firms; and studying the economic factors associated with avoiding and complying with regional water quality regulations and county permitting processes.

Right-of-Way Studies

- Conducted a valuation of a right-of-way occupied by a discharge pipeline from the Georgia Pacific facility in Toledo for the City of Newport
- Submitted an affidavit in support of the fee that the City charges to access the municipal right-of-way
- Analyzed the economic issues of telecommunications firms' challenge, under the Telecommunications Act of 1996, regarding Portland's franchise-fee agreements for right-of-way use, City of Portland
- Evaluated the fees that a city in California charged a telecommunications company to access the city-owned right-of-way, private client
- Reviewed economic issues specific to the Telecommunications Act of 1996 regarding the fees charged to telecommunications firms for right-of-way, City of Huntsville, Alabama
- Evaluated right-of-way fees that were challenged by a telecommunications company under the Telecommunications Act of 1996, City of Tucson, Arizona
- Provided economic analysis regarding the economic value of municipal rights-of-way and use of the rights-of-way by a telecommunications company, City of Portland, Oregon
- Analyzed the economic damages from trespass outside a right-of-way in a New Mexico Pueblo during the construction of a petroleum production pipeline, Kelly, Haglund, Garnsey & Kahn

Economic and Socioeconomic Impact Analysis

- Reviewed the market for workers' compensation insurance in Oregon.
- Assessed the financial implications of switching from franchise fees to a gross-revenue tax on telecom services provided in the municipalities.
- Conducted an economic benefit-cost comparison of a conventional roof and a greenroof on a commercial building, for the City of Portland.
- Assessed the impacts of greenstreets in the Puget Sound on property values for adjacent properties.
- Analyzed the operations and financial performance of a timber company's cogeneration facilities and determined the profits earned by the company as a result of unfair competition stemming from violations of air-quality regulations
- Described the economic aspects of zoning incentives to protect natural resources, City of Corvallis, Oregon
- Conducted a market analysis for industrial products in regional and world markets, private client
- Evaluated the socioeconomic impacts of hospitals on rural economies, Mercy Medical Center
- Conducted a cost-benefit analysis of energy efficiency and renewable energy resources, Alaska Coalition
- Calculated the economic impacts of restricting snowmobiles from several national parks, The Wilderness Society
- Analyzed the potential economic impacts of designating a national monument on land currently managed by the Siskiyou National Forest and Bureau of Land Management, Siskiyou Educational Project
- Reviewed an economic impact assessment of a submarine cable and terminus at San Luis Obispo, California, North State Resources
- Assessed the socioeconomic impacts of the proposed Pelican Butte ski area, Winema National Forest
- Evaluated the economic consequences of new restrictions on Alaska's fishing industry, Earth Justice
- Analyzed the Interior Columbia River Basin Ecosystem Management Project to ensure it internalized the externalities of resource-extraction industries on federal lands in eastern Washington, eastern Oregon, and Idaho, W. Alton Jones Foundation

Microeconomic Analysis

- For attorneys representing plaintiffs in a class action lawsuit, performed an analysis of the economic aspects of alleged violations by mortgage brokers of consumer truth-in-lending practices.
- For attorneys representing plaintiffs in a class action lawsuit, assessed the economic aspects of alleged inflated home appraisals.

- Determined the appropriate sample size required to confirm key characteristics about a phone pole population.
- Conducted an economic evaluation of a property at issue in a claim against a state.
- Provided economic analysis regarding litigation over a city's method of collecting user fees for stormwater services.
- Evaluated the financial feasibility of a proposed destination resort in Central Oregon on the Gould and Cline Buttes
- Calculated the plaintiff's lost profits and reasonable royalty in a patent infringement case, Schwabe, Williamson & Wyatt
- Studied the factors that determine the market price for grass seed grown in Oregon, private client
- Determined a royalty rate as compensation for economic damages in a breach of contract lawsuit, Schwabe, Williamson & Wyatt
- Provided economic analysis of a patent infringement claim regarding suspension systems for bicycles, Schwabe, Williamson & Wyatt
- Analyzed the national market for cookware items and the financial performance of firms that participate in the market, Schwabe, Williamson & Wyatt
- Evaluated the market for professional manuals used by attorneys and legal assistants in Oregon, private client
- Calculated the economic impacts associated with a proposed petroleum-products pipeline across Texas, George & Donaldson
- Assessed the economic effects associated with a proposed petroleum-products pipeline in Washington state, Schwabe, Williamson & Wyatt
- Determined the economic consequences of a breach of contract associated with a computer software program, Moore & Orr
- Calculated uncompensated expenses and lost profits associated with a contract dispute between a manufacturer of video lottery terminals and the Oregon State Lottery, Davis Wright Tremaine
- Analyzed lost profits from various patent infringement cases, Kolisch, Hartwell, Dickinson, McCormack, & Heuser

Antitrust Economics

- Assessed potential anti-trust behavior in the market for acute care and tertiary medical services.
- Assessed economic aspects of alleged patent infringement of computer toolbar technology.
- For the plaintiffs, assessed economic damages to patent holders of alleged patent infringement in the power equipment market
- Addressed the economic issues of class certification and damage calculations related to alleged antitrust violations in the market for residential lots

- Studied the market for MRI services in the Boise area and assessed alleged anticompetitive behavior in this market
- Analyzed claims of misappropriation of trade secrets, intentional interference with economic relations, and breach of contract, Schwabe, Williamson & Wyatt
- Analyzed the market for diagnostic-imaging services in the Portland metropolitan area, Haglund, Kirtley, Kelley & Horngren
- Calculated the economic impacts of alleged price fixing in the market for agricultural commodities, Tonkon, Torp, Galen, Marmaduke & Booth
- Provided economic consultation in preparation for litigation regarding workers' compensation insurance, private client
- Assessed the economic consequences of price discrimination and other antitrust behavior in the wholesale market for petroleum products in Cordova, Alaska, Condon Shoup

Economics of Health Care

- Evaluated how the approval of a hospital's Certificate-of-Need application would influence market concentration, Thorp Purdy Jewett Urness & Wilkinson
- Studied economic aspects of defining a hospital's service area as it applied to Oregon's Certificate-of-Need requirement for new or relocated hospitals, Thorp Purdy Jewett Urness & Wilkinson
- Identified the relevant markets for hospital services and evaluated the extent to which hospitals exercised market power over insurance firms and competing hospitals, Schwabe, Williamson & Wyatt
- Studied the market for home intravenous care in preparation for a possible antitrust lawsuit, Watkinson Laird Rubenstein Lashway & Baldwin
- Provided economic consultation on the market for healthcare services in Southern Oregon, Schwabe, Williamson & Wyatt
- Evaluated damage claims, researched prices for hospital services, and provided advice on the distinction between fixed and variable costs, Schwabe, Williamson & Wyatt
- Calculated lifetime medical expenses and lost wages as part of various personal injury and wrongful death lawsuits, private clients
- Assessed the economic impacts of a breach of contract associated with a medical diagnostic technique, Stoel Rives
- Quantified the net present value of lifetime medical services associated with a medical malpractice suit, private client
- Evaluated the growth and discount rates of life care plans, Calkins & Calkins

Analysis of Economic Damages to Natural Resources

- Assessed a construction company's ability to pay civil penalties associated with alleged violations of air-quality regulations.
- Described the economic value of water resources in California.
- Assessed the economic impacts on an oyster grower of the oil spilled from the grounding of the *New Carissa*, Davis Wright Tremaine

- Conducted an economic analysis of the damages stemming from the Wheeler Point fire in central Oregon, Kafoury & McDougal
- Calculated the economic impacts of the Exxon *Valdez* oil spill on Alaskan salmon fishermen, municipal governments, area businesses, and cannery workers, Stoll, Stoll, Berne, Lokting, Shlachter
- Evaluated damage claims by area businesses and property owners affected by a pesticide spill in the Sacramento River, Lieff, Cabraser & Heimann
- Assessed the economic consequences of a chemical spill on the municipality of Superior, Wisconsin, private client
- Determined the economic impacts on area businesses of an oil spill off Huntington Beach, California, Law Offices of Gretchen Nelson
- Evaluated the demand for recreational fishing in the Flathead Lake area of Montana, Montana Attorney General's Office

Public Policy and Government Regulations

- Calculated the economic damages to a seafood-related business as a result of a license dispute with the State of Washington, private client
- Studied the economic performance of the ski industry in the Lake Tahoe area, the market conditions that affect this sector of the region's economy, and the economic factors associated with avoiding and complying with regional water quality regulations and county permitting processes, California Attorney General's Office
- Provided economic analysis regarding a contract dispute between the City of Eugene, Oregon and a tenant leasing city-owned property, Harrang Long
- Calculated tobacco company profits associated with the consumption of cigarettes by under-age smokers, Attorneys General of Washington, Arizona, and Connecticut

Labor and Welfare Economics

- Calculated the economic loss resulting from the employment termination of a 56-year-old male, private client
- Quantified the economic loss to a regional bank associated with breach of contract by former employees, Arnold Gallagher Saydack Percell
- Provided economic analysis for wage arbitration with municipal employees, City of Coos Bay, Oregon

Endangered Fish and Wildlife

- Described the economic effects of designating critical habitat for two endangered species of fish in the Klamath Basin of Oregon and California, U.S. Fish and Wildlife Service
- Critiqued a draft report on the potential economic consequences of designating critical habitat for the Steller's and spectacled eiders, private client
- Evaluated the potential economic impacts of restricting Alaska's groundfishery in critical habitat for the endangered Steller sea lion, private client
- Analyzed the economic consequences of designating critical habitat in California, Oregon, and Washington for the marbled murrelet, U.S. Fish and Wildlife Service

- Assessed the economic effects of an injunction to protect salmon habitat on the Wallowa-Whitman and Umatilla National Forests, private client

Forest Resources

- Prepared a critique of the U.S. Forest Service's estimated demand for timber from the Tongass National Forest, Alaska Rainforest Campaign
- Analyzed the economic consequences on southeast Alaska's economy of reduced timber harvest in the Tongass National Forest, Sierra Club Legal Defense Fund and the Alaska Rainforest Campaign
- Studied the relationships between forested ecosystems and regional economies in Oregon, Alaska, North Carolina, New Hampshire, New Mexico, and Wisconsin, National Science Foundation
- Evaluated the opportunities and threats facing timber-dependent communities affected by logging restrictions on federal land in Washington state, Washington Community Development Department

Water Resources

- Developed an economic model to determine the economic benefits of riparian-restoration projects for Clean Water Services.
- Co-instructed a seminar at Portland State, "USP 505 Evaluating Low Impact Development (LID)," that focuses in part on the economic costs and benefits of managing stormwater by LID and conventional controls
- Calculated the value of ecosystem services that could be degraded by stormwater runoff from expanded urban and commercial developments in the East Butte area of Portland for the City of Portland
- Assisted the City of Portland staff in developing an approach to study the economic benefits and costs of alternative stormwater-management techniques in support of the City's Watershed Plan
- Conducted a review of the literature on the economics of Low Impact Development for Waterkeeper Alliance
- Analyzed the range of economic costs and benefits of projects and policy options affecting water quality and quantity in a Portland, Oregon watershed that drains to the Willamette River, City of Portland
- Described the economic tradeoffs of allowing, limiting, or prohibiting development in significant riparian areas and wildlife habitat in the Portland metropolitan area, Metro
- Developed a handbook on the economic factors associated with relicensing a hydroelectric dam, Hydropower Reform Coalition
- Developed an economic model to determine the net economic benefits of riparian-restoration projects in Oregon, Clean Water Services
- Reviewed the U.S. Army Corps of Engineers' *Final Environmental Impact Statement* on deepening the shipping channel in the Columbia and Willamette Rivers, private client

- Studied the economic issues associated with water management services and the economic implications associated with the federal Endangered Species Act and Clean Water Act, Clean Water Services
- Evaluated the economic impacts of bypassing four federal dams on the Lower Snake River and developed a plan to mitigate the negative consequences of the bypass, Trout Unlimited and Earthjustice
- Determined the direct and indirect economic impacts of economic development projects in the Columbia River Gorge funded by the National Scenic Area Act, Columbia River Gorge Commission
- Evaluated the potential impacts of a proposed gold mine in Montana's Blackfoot River watershed on employment and quality of life, Blackfoot Legacy
- Assessed the economic consequences of modifying hydroelectric dams to protect and enhance riparian habitat, private client
- Prepared a response to the Draft Environmental Impact Statement for the Columbia River System Operation Review, Confederated Tribes of the Umatilla Indian Reservation
- Assessed the economic consequences of alternative strategies for managing the Columbia River and its tributaries, Northwest Water Law and Policy Project

Recent Presentations

- "Low-Impact Development Economics." October 22, 2008. NEMO University-6.
- "The Economics of Low-Impact Development." NY/NJ Baykeeper 2008 Low Impact Development Conference. January 23, 2008. New York City, New York.
- "Assessing Low-Impact Development Using a Benefit-Cost Approach." California Stormwater Quality Association (CASQA) 3rd Annual Stormwater Conference. September 11, 2007. Costa Mesa, California.
- "Valuing Ecosystem Services in Portland, Oregon: A Case Study." Emerging Issues Along Urban/Rural Interfaces II Conference. April 9-12, 2007. Atlanta, Georgia.
- "Assessing Low Impact Developments Using a Benefit-Cost Approach." 2nd National Low Impact Development Conference. March 12-14, 2007. Wilmington, North Carolina.

Publications

"Low-Impact Stormwater Controls Can Increase the Bottom Line." *Home Building News.* August 2008.

The Economics of Low-Impact Development: A Literature Review. Waterkeeper Alliance. With S. Reich. November 2007.

"Cities Challenged in Their Economic Interpretation of the Telecommunications Act of 1996." *Municipal Lawyer*. With E. Whitelaw and A. Pearce. September/October 2006.

"A Framework for Estimating the Costs and Benefits of Dam Removal." *BioScience* 52 (8). With E. Whitelaw. August 2002.

The Economic Benefits of Renewable Energy and Cost-Effective Energy Efficiency. Alaska Coalition. With E. Niemi and A. Fifield. September 2001.

An Economic Strategy for the Lower Snake River. Trout Unlimited. With E. Whitelaw. November 1999.

The Potential Economic Consequences of Designating Critical Habitat for the Marbled Murrelet: Final Report. U.S. Fish and Wildlife Service, Portland Field Office. With E. Niemi, E. Whitelaw, and D. Taylor. 1996.

The Potential Economic Consequences of Critical Habitat Designation for the Lost River Sucker and the Shortnose Sucker: Final Report. U.S. Fish and Wildlife Service, Portland Field Office. With E. Niemi and E. Whitelaw. August 1995.

Economic Consequences of Management Strategies for the Columbia and Snake Rivers. Confederated Tribes of the Umatilla Indian Reservation. With E. Niemi and E. Whitelaw. July 1995.

Economic Consequences of an Injunction to Protect Salmon Habitat on the Wallowa-Whitman and Umatilla National Forests: Preliminary Report. With E. Niemi and E. Whitelaw. 1995.

The Columbia River and the Economy of the Pacific Northwest. With E. Niemi, E. Whitelaw, and A. Gorr. May 1995.

The Potential Economic Consequences of a Reduction in Timber Supply from the Tongass National Forest. With E. Whitelaw. December 1994.

MARK BUCKLEY

Ph.D., Environmental Studies, University of California, Santa Cruz
B.A., Economics, Davidson College

Mark Buckley joined ECONorthwest in 2008. Dr. Buckley develops economic models and analytical methods for planning and behavior involving water resources and land use. In particular, he combines microeconomic and game-theoretic techniques with competence in the biophysical aspects of natural systems. Dr. Buckley specializes in bringing a disaggregated behavioral approach to economic analysis so as to capture the important differences and interactions that drive demand for natural resources. His work includes assessment of cost-effective approaches to restore Puget Sound; landscape-scale restoration in the Sacramento River valley, coordinating agriculture with development and habitat goals along the Skagit River, water planning with reclaimed water for King County, Washington; cost and risk management on large wildfires for the U.S. Forest Service, development of tools for communities to select appropriate water portfolios in California, sustainable forestry and carbon accounting for public and private forests, levee setbacks for urban rivers, and water quality trading in the Lake Tahoe basin. Buckley's research has been published in peer-reviewed journals and edited books and he is an adjunct professor for environmental economics at Portland State University.

Environmental Policy and Resource Management

Restoration and Allocation of Water Resources

- Described the economic benefits and costs associated with producing and using reclaimed water and worked with King County to incorporate this information into a benefit-cost analysis of potential reclaimed water projects, King County, Washington
- Designed and implemented interviews and surveys to identify obstacles and opportunities for participation in stormwater incentive programs and identified the costs and benefits to individuals that encourage or discourage participation for Portland's Bureau of Environmental Services
- Analyzed the costs and benefits of various options for restoring Puget Sound, including low-impact development projects, and assessed the feasibility of various market-based mechanisms for project evaluation and implementation
- Analyzed feasibility and developed mechanism characteristics for water quantity trading in the Yakima River basin, Washington
- Analyzed the potential economic consequences of public investments in existing and proposed irrigation systems for the Montana Department of Natural Resources
- Assessed impacts of lower levels for Lake Roosevelt and increased downstream flows in the Columbia River
- Compiled and analyzed costs and benefits of pollutant reduction opportunities for Lake Tahoe clarity restoration efforts

- Surveyed and interviewed farmers and restoration project managers in the Sacramento River Conservation Area. Built decision and behavior models to identify strategies and outcomes for collaboration on landscape scale ecological restoration
- Designed tools and techniques to help coastal communities compare the costs and benefits of water supply options, including desalination and water recycling and compared the equity and distribution of options
- Estimated the costs and benefits of various options for use of reclaimed water for King County, Washington
- Estimated costs and benefits influencing individual decisions by farmers to participate or not in watershed-scale water quality management

Environmental Markets

- Analyzed options for farmers to sell ecosystem services in the Skagit River watershed
- Estimated revenue potential from carbon and other ecosystem service markets for public forests in Clackamas County, OR
- Conducted feasibility study, case study comparisons, and program design for water quality crediting and trading to support the Lake Tahoe TMDL
- Analyzed market-based mechanisms and opportunities for disaggregated and behavioral approaches to restoring Puget Sound
- Assessed financial opportunities for multi-credit sales of single-site conservation efforts addressing wetland, water quality, habitat, and coverage markets
- Assessed feasibility of revenues from publicly-owned forests via environmental markets for Clackamas County, OR
- Assessed potential for farmers participate in ecosystem service-based markets in Skagit County, WA

Forest Management

- Assessed the public and private costs and benefits for public forest sustainable certification and ecosystem market participation for Clackamas County, OR
- Assembled and lead the Secretary of Agriculture's Large Wildfire Independent Review on cost and risk, investigating tools, behaviors, and incentives for improving federal fire suppression efforts
- Identified market and non-market costs and benefits for possible logging strategies on publicly owned watershed forest for city of Santa Cruz, California

Endangered Fish and Wildlife

- Estimated cost of offsetting impact of once-through cooling operations for power plants on California's central coast. Target habitats include estuaries and near-shore marine with endangered bird and marine mammal species
- Identified types of impacts of potential endangered species establishment on private lands. Provided strategies for species restoration compatible with private land use

Sustainable Management of Ecosystems and Communities

- Assessed the drivers for sustainability of agriculture and developed indicators in Skagit County, WA
- Analyzed the economic impacts of the effects of a proposed energy transmission line through Montana and Idaho
- Designed database tool for estimating costs of monitoring activities for indicators and desired conditions in the Lake Tahoe basin
- Analyzed costs and benefits influencing cooperation decisions for private landowners for invasive plant control programs

Economics of Regulations

- Operated simulation models and conducted econometric analyses to estimate firm-specific impacts of Clean Air Act regulations on the iron and steel industry
- Estimated the costs of a business-as-usual approach to climate change for Washington, Oregon, and New Mexico.
- Estimated national costs of Clean Water Act compliance net of state and local water quality requirements
- Operated simulation models and conducted econometric analyses to estimate firm-specific impacts of Clean Air Act regulations on the reinforced plastics industry

Complex Systems Analysis

- Developed indicators and model mechanisms for Alternative Futures model of Skagit County, WA
- Created agent-based models of restoration activities in agricultural landscapes to identify successful spatial strategies for project site selection
- Developed agent-based models to simulate learning and criminal behavior based on nearby activity
- Collaborated on spatially-explicit agent-based models of cooperation and competition for limited resources

Expert Testimony and Support

Economic Damages to Natural Resources

- Estimated value of damages to ecosystem services via Habitat Equivalency Analysis for Superfund mining site
- Estimated the costs of damages to fisheries and estuary ecosystem from coastal power plant expansion in Moss Landing, California
- Conducted economic analyses to compare damages of proposed power plant expansion to benefits of proposed restoration activities for Morro Bay, California, including use and improvement of standard Habitat Equivalency Analysis techniques

Publications

Buckley, M. and K. Holl. Forthcoming. "Tools from Game Theory for Improving Ecological Restoration Outcomes." *Social Dimensions of Ecological Restoration,* D. Egan, E. Hjerpe, J. Abrams (eds). Island Press.

Buckley, M. and E. Crone. 2008. "Negative Off-Site Impacts of Ecological Restoration: Understanding and Addressing the Conflict." *Conservation Biology.* 22(5): 1118-1124.

Buckley, M. 2008. "Ecosystem Service Trading Markets: An Important Conservation Tool." *Conservation Science Institute Quarterly.*

Buckley, M. 2007. "The Problem of Restoring Natural Systems Among Social Systems: Strategic Considerations and the Sacramento River." Ph.D. Dissertation. University of California, Santa Cruz.

- 2007. Encyclopedia entries for Cost-Benefit Analysis, Efficiency, Riparian Rights, and Nash Equilibrium. *Encyclopedia of Environment and Society*. P. Robbins (ed). Sage: Thousand Oaks, CA.

Langridge, S.M., M. Buckley, K. D. Holl. 2007. "Strategies for overcoming obstacles to restoring natural capital: Large-scale restoration on the Sacramento River". *Restoring Natural Capital,* J. Aronsen, S. Milton, J. Blignaut (eds). Island Press.

Buckley, M. and B. Haddad. 2006. "Socially Strategic Restoration: A Game-Theoretic Analysis of River Restoration." *Environmental Management* 38(1): 48-61.

- 2005. "Economic Analysis of Environmental Impacts of Cooling Operations and Proposed Restoration Mitigation for Morro Bay Power Plant." Prepared for Earthjustice Legal Defense Fund.

Buckley, M., M. Cloutier, S. Daley, V. Dossetti, T. Gieseke, and D. Rojas. 2005. "Criminal's Dilemma: Modeling Criminal Decision-making as a Complex System." New England Complex Systems Institute. Working Paper. www.necsi.org.

Buckley, M., D. DeLaurentis, H. Goldstone, K. Jeev, D. Orlando, and D. Whitney. 2005. "Emergence of Cooperation in an Agent-Based Predator-Prey Model." New England Complex Systems Institute. Working Paper. www.necsi.org.

Buckley, M. 2004. "Strategic Restoration: Game Theory Applied to the Sacramento River Conservation Area". Proceedings of the 16th International Conference of the Society for Ecological Restoration. Victoria, BC.

Haddad, B, M. Buckley, A. Richards, and J. Scorse. 2001. "Economic Issues and Nonmarket Values." Watershed Resources Management Plan. Prepared for the City of Santa Cruz Water Department.

Van Houtven, G., T. Bondelid, M. Buckley, and R. Figueroa. 1999. "National Surface Water Toxics Study—Status Report on Model Development." Prepared for the U.S. Environmental Protection Agency.

Brunnermeier, S., M. Buckley, and G. Van Houtven. 1999. "Cost Assessment of Clean Water Act." Prepared for the U.S. Environmental Protection Agency, Office of Water.

Bingham, T., B. Depro, M. Buckley. 1999. "Economic Impact Analysis for Air Pollution Regulations on the Reinforced Plastics Industry." Prepared for the U.S. Environmental Protection Agency.

Presentations

Buckley, M. 2010. "Identifying and Estimating Economic Benefits from Antidegradation – the Clean Water Act." Invited. River Network Annual Conference. Snowbird, UT.

- 2010. "Economics and Uncertainty for Restoring Ecosystem Services in Puget Sound." Society for Ecological Restoration - Northwest. Tukwila, WA.

- 2009. "Markets and Incentives for Restoring Water Quality in Puget Sound." 2009 Annual Water Resources Conference. American Water Resources Association. Seattle, WA.

- 2009. "Potential Economic Costs of a Business-as-Usual Approach to Climate Change: Implications for Water Resources in Three Western States." 2009 Annual Water Resources Conference. American Water Resources Association. Seattle, WA.

- 2009. "Water Quality Trading as a Tool for Puget Sound Recovery: Lessons, Obstacles and Opportunities." 2009 Puget Sound Georgia Basin Science Conference.

- 2009. "Water Resources and Markets for Ecosystem Services." Invited. Oregon State University.

- 2009. "Valuing Ecosystem Services from Beaver Restoration." Invited. Working Beavers Conference. Liberty Lake, WA.

- 2008. "Restoring Puget Sound with an Incremental Market-Based Approach." A Conference on Ecosystem Services. Naples, FL.

- 2008. "Instream Value Considerations for Watershed Restoration." Invited. Instream Values Symposium, Washington State Department of Ecology. Lacey, WA.

- 2007. "Addressing Risk, Uncertainty, and Behavioral Effects to Inform the Viability and Design of a Water Quality Trading Program for Lake Tahoe." Truckee River Headwaters Symposium: Headwaters to Terminus. Reno, NV.

- 2007. "Strategic Interactions Across Property Boundaries in Invasive Plant Control and Implications for Cooperation." Invited Plenary. California Invasive Plant Council Meeting. San Diego, CA.

- 2007. "Restoring Natural Systems Among Social Systems: Strategic Considerations from the Sacramento River." Ecological Society of America Meeting. San Jose, California.

- 2007. "Increasing the Ecological Gains from Water Quality Crediting and Trading: Disaggregated Strategic Responses and an Application to the Lake Tahoe Basin." U.S. Society for Ecological Economics Biannual Conference, New York, NY.

- 2007. "Ecological Restoration and Local Landowner Responses: a Survey and Game Theory Simulations From the Sacramento River." 7th Meeting on Game Theory and Practice Dedicated to Energy, Environment and Natural Resources. GERAD, University of Montreal, Montreal, QC.

- 2007. "Negative Off-Site Impacts ff Ecological Restoration: Understanding and Avoiding Conflict." The Nature Conservancy Sacramento River Science Conference, Sacramento, CA.

- 2006. "Local Scale Game-Theoretic and Landscape Scale Agent-Based Models of Social Conflict for Restoration of the Sacramento River." CALFED Science Conference, Sacramento, CA.

- 2006. "A Comprehensive Economic and Environmental Framework Tool to Fully Assess the Benefits and Costs of Desalination." CALFED Science Conference, Sacramento, CA.

- 2005. "Local Strategic Interactive Models and Landscape Scale Agent-Based Simulation for Conservation and Restoration Planning." American Water Resources Association Conference. Seattle, WA.

- 2005. "Extending local interactive models to the landscape scale using agent-based simulation for the Sacramento River Conservation Area." U.S. Society for Ecological Economics Biannual Conference, Tacoma, WA.

- 2005. Socially Strategic Restoration: Survey Data and Decision Models for the Sacramento River Conservation Area." Sacramento River Conservation Area Technical Advisory Committee. Invited.

- 2005. "Distribution of Weeds in an Agricultural-Natural Landscape Mosaic: Are Restored Forests Bad for Farmers?" U.S. Department of Agriculture Managed Ecosystems Conference. Washington, DC. Invited.

- 2004. "Farmers and Restoration: Strategic Decision Models Using Survey Data for the Sacramento River Conservation Area." CALFED Science Conference, Sacramento, CA.

- 2004. "Strategic Restoration." Northern California Environmental Economics Conference, CSU-Chico. Invited.

- 2004. "Economics, Games, and Policy Implementation." PrecipNet Climate Change Conference. Santa Cruz, CA. Invited.

- 2004. "Contingent Decision-Making and River Restoration." International Society for Ecological Economics Biannual Conference, Montreal, QC.

- 2004. "Strategic Restoration: Applying Game Theory to Conflict over Restoration on the Sacramento River." International Society for Ecological Restoration, Victoria, BC.

- 2003. "A Game-Theoretic Model of the Sacramento River Restoration." U.S. Society for Ecological Economics Biannual Conference, Saratoga Springs, NY.

ERNEST NIEMI

M.C.R.P. Urban Planning and Public Policy, Harvard University
B.A. Chemistry, University of Oregon

Ernest Niemi has been a vice president and senior economist at ECONorthwest since 1978. He specializes in applying the principles of cost-benefit analysis, economic valuation, and economic-impact analysis in the context of natural-resource management, economic development, and public-policy decisions. He has presented analytical findings to congressional, judicial, arbitrative, administrative, and scientific/professional bodies.

Niemi has taught cost-benefit analysis and economic development for the University of Oregon's Department of Planning, Public Policy, and Management. He is or has been a member of the Budget Advisory Committee for Lane Electric Cooperative, the Roads Advisory Committee for Lane County, the Board of Directors of the Pacific Rivers Council, the Board of Directors of the Center for Community and Watershed Health, the Budget Committee for the Pleasant Hill School District, the Technical Advisory Committee on Land Use and Economic Development for the Oregon Department of Land Conservation and Development, the Citizen's Task Force for Developing a Strategic Plan for the Oregon Department of Fish and Wildlife, and the Water Marketing Task Force for the Oregon Water Resources Department.

Environmental Policy and Resource Management

Forest Management

- Evaluated the feasibility of proposals to acquire forest land within a watershed and manage the forest and associated water resources to generate revenue, private client
- Described the economic value of resources at Cooper Spur, in the Mt. Hood National Forest, that would not be developed under a proposed land swap, Crag Law Center
- Described the economic costs that might materialize if logging occurred on national forest lands that had experienced wildfire, Cascade Resources Advocacy Group
- Evaluated economic analyses that had been developed to support the implementation of a proposed habitat conservation plan for private and state-owned forest lands, private client
- Reviewed a draft chapter of a forthcoming book regarding the socioeconomic consequences of the Northwest Forest Plan, private client
- Reviewed the economic elements of the U.S. Forest Service's draft environmental impact statement of salvage logging proposals for the burned areas within the perimeter of the Biscuit Fire in southern Oregon, Siskiyou Regional Education Project
- Evaluated the need for improved voluntary measures and new regulations regarding the application of aesthetic forestry principles and techniques to state and private lands in Washington, private client
- Described the economic issues underlying proposals to conduct salvage logging in areas burned by the Biscuit Fire, Conservation Biology Institute

- Described how forest-management approaches that emphasize sustainability and stewardship can have positive economic consequences, Washington Environmental Council
- Developed a method for determining the sediment-related costs imposed on the City of Salem and its industrial/commercial water users during and following a major flood event in the North Santiam watershed, U.S. Environmental Protection Agency and National Science Foundation
- Analyzed the impacts of wildfire and fire-related programs on communities in the wildland-urban interface and on low-income residents in particular, Center for Watershed and Community Health
- Described the potential economic impacts of the Roadless Initiative in Idaho and Montana, which would prevent commercial logging on roadless areas in national forests, Wilderness Society
- Analyzed economics and collaborative decision-making to make the process of competition for natural resources more efficient and effective, Bolle Center for People and Forests
- Described the potential economic impacts of reducing logging on the national forests, the non-timber benefits the nation enjoys from these forests, and the potential benefits that would materialize if Congress opted to restore damage from past logging, Sierra Club
- Evaluated the social and economic contributions of national forests and analyzed the externalized cost of logging on national forests, Forest Guardians
- Described the economy's response in the Pacific Northwest to logging reductions, Earthlife Canada Foundation and Sierra Club of British Columbia
- Evaluated alternatives for reforestation of marginal agricultural lands in the Lower Mississippi Delta, Business Council for Sustainable Development
- Described the economic effects of forest-management strategies to enhance salmon habitat on six national forests in Idaho, Pacific Rivers Council
- Analyzed the full economic costs of salvage logging on federal lands, Pacific Rivers Council
- Described the appropriate baselines for economic impact analysis related to forest policy alternatives in the Pacific Northwest, Wilderness Society
- Developed recommendations for improving the design and implementation of policies for managing complex forest resources, U.S. Forest Service
- Assessed local economic conditions with and without a change in forest management policy that would protect remaining old-growth forests on federal lands, Wilderness Society

Restoration and Allocation of Water Resources

- Characterized the economic value of ecosystem services within the Green River's riparian corridor, quantified the marginal economic benefits and costs of several alternative levee setback scenarios for the Green River, and identified the equity and risk implications of each alternative, King County, Washington
- Described the economic benefits and costs associated with producing and using reclaimed water and worked with King County to incorporate this information into a benefit-cost analysis of potential reclaimed water projects, King County, Washington

- Analyzed the costs and benefits of various options for restoring Puget Sound, including low-impact development projects, and assessed the feasibility of various market-based mechanisms for project evaluation and implementation
- Constructed a net social and economic benefit analysis of four potential alternatives for future management of the Capitol Lake Basin in Olympia, Washington
- Analyzed the potential economic effects of a proposed water-bottling facility, including effects on local employment, population, public resources, and natural resource amenities, private client
- Performed an economic evaluation of watershed-restoration projects in northern California, focusing on the projects' impacts on coastal and estuarine resources, West Coast Watershed
- Conducted an independent technical review of the net social and economic benefit analysis studies informing the Deschutes Estuary feasibility study, Washington State Department of Fisheries
- Contributed to a draft planning report/environmental impact statement that examined the feasibility, acceptability, and environmental consequences of alternatives to create additional water storage within the Yakima River basin, Bureau of Reclamation and the Washington State Department of Ecology
- Analyzed issues associated with proposals to move toward sustainable use of water and other resources in Northern California, West Coast Watershed
- Prepared economic elements of an environmental impact statement for proposed drawdown of Lake Roosevelt, Washington State Department of Ecology
- Analyzed the relationship between irrigated agriculture and Montana's economy, Montana Department of Natural Resources
- Performed an economic evaluation of watershed restoration projects in northern California to facilitate a grant application, West Coast Watershed
- Described the value of water in the Green River Basin by taking an inventory of the various categories of uses and functions of water and determining the economic value of each use and function, Wyoming Water Development Commission
- Calculated the benefits that a public water utility could realize by relying on the protection and planting of trees rather than the expansion of its waste-water treatment facility to meet water-quality objectives, private client
- Analyzed the positive and negative economic consequences of restoring natural streamflows in the Eel River, Center for Environmental Economic Development
- Analyzed and commented on a draft report regarding economic, social, and institutional issues with water allocation in the Klamath Basin, Institute for Fisheries Resources
- Described the competition for water in the Upper Klamath Basin and the relationship between water and the economy, Public Interest Projects
- Determined the share of natural and actual streamflow that originates on national-forest lands in Oregon's Willamette River Basin, U.S. Environmental Protection Agency
- Assessed the potential economic benefits and costs of the reservoir, related infrastructure, and activities included in the proposed Animas-La Plata project in southwestern Colorado, Earthjustice

- Described economic dimensions of watershed restoration to provide baseline information for designing and evaluating proposals to restore watersheds in the Sierra Nevada, Pacific Rivers Council
- Developed an integrated system for identifying areas of greater ecological and socioeconomic potential for restoration of riparian areas, U.S. Environmental Protection Agency
- Prepared a response to the Draft Environmental Impact Statement for the Columbia River System Operation Review, Confederated Tribes of the Umatilla Indian Reservation
- Described the economic effects of state water-regulation policies, Bullitt Foundation and Water Watch
- Described the economic consequences of alternative hatchery-management programs, Columbia Basin Fish and Wildlife Authority
- Reviewed the proposed economic-evaluation procedures for allocating unappropriated water in the Snake River Basin, State of Idaho Office of the Governor
- Evaluated alternative plans to manage watersheds affected by the eruption of Mount St. Helens, Cowlitz County
- Evaluated recreational fisheries in the Flathead Lake area, State of Montana
- Evaluated proposed policies for leasing wetlands, Oregon Division of State Lands

Sustainable Management of Ecosystems

- Described the potential economic costs to New Mexico, Oregon, and Washington of a business-as-usual approach to climate change.
- Directed a seminar aimed at providing staff with information, skills, and tools to apply adaptive management to the Missouri River Recovery Program, the U.S. Army Corps of Engineers
- Conducted an economic analysis of alternative plans associated with the restoration of sage-steppe ecosystems, California Bureau of Land Management
- Described the potential economic consequences of alternative uses of Nebraska's natural resources, State of Nebraska
- Described common errors in economic-impact studies that cause them to downplay the economic benefits and exaggerate the economic costs of environmental protection, Earthjustice
- Analyzed data on Oregonians' stated importance of and willingness to pay for salmon habitat recovery, U.S. Department of Agriculture, Forest Service
- Managed the drafting of a letter signed by more than 100 economists addressed to President Bush and the governors of eleven western states regarding the economic importance of the West's natural environment
- Provided technical assistance on a handbook for implementing the economic aspects of the Enlibra principles, adopted for managing natural resources, private client
- Described the economic tradeoffs of allowing, limiting, or prohibiting development in significant riparian areas and wildlife habitat in the Portland metropolitan area, Metro

- Described the economic benefits of protecting natural resources in the Sonoran Desert, Coalition for Sonoran Desert Protection
- Analyzed Louisiana's economy to help local stakeholders implement a strategy for moving the state toward conservation-based development, Ford Foundation
- Evaluated the economic consequences of different approaches to managing the environmental resources of Southern Louisiana, particularly its coastal wetlands, W. Alton Jones Foundation

Endangered Fish and Wildlife

- Reviewed the government's economic analysis for the proposed designation of critical habitat for Marbled Murrelets, and provided comments, Earthjustice
- Described the economic consequences of a proposal to protect critical habitat for the Tidewater Goby, private client
- Conducted an economic analysis of proposed infrastructure improvements to enhance the seafood industry in Franklin County, Florida, private client
- Described the potential economic effects of federal decisions regarding the management of habitat for marbled murrelets and northern spotted owls in Washington, Oregon, and northern California, private client
- Analyzed the economic issues related to protection and restoration of habitat for the red-legged frog in California, Pacific Rivers Council
- Reviewed a draft analysis prepared by NOAA Fisheries of the potential economic consequences of designating critical habitat for 13 species of Pacific salmon and steelhead, Earthjustice
- Analyzed the U.S. Fish and Wildfire Service's draft proposal to designate critical habitat for the California gnatcatcher, Natural Resources Defense Council
- Analyzed the potential economic consequences of designating critical habitat under the federal Endangered Species Act for the cactus ferruginous pygmy-owl in Arizona, Defenders of Wildlife
- Outlined the economic issues that should be addressed in a proposal under the Endangered Species Act to designate critical habitat for bull trout in the Deschutes Basin, Deschutes Board of Control
- Evaluated alternatives for mitigating the potential adverse economic effects and for enhancing the potential positive effects of salmon recovery on the Columbia River Basin, Portland State University
- Reviewed the U.S. Army Corps of Engineers' *DRAFT Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement*, Trout Unlimited
- Described the economic consequences of salmon conservation along the Pacific coast of North America, Center for Watershed and Community Health
- Evaluated the economic components of the federal government's final supplemental environmental impact statement for spotted owl habitat, Sierra Club Legal Defense Fund
- Described the economic effects of designating critical habitat for the marbled murrelet in Oregon, Washington, and California, U.S. Fish and Wildlife Service

- Described the economic effects of designating critical habitat to support the recovery of two endangered species of fish in the Klamath Basin of Oregon and California, U.S. Fish and Wildlife Service
- Described the economic effects of designating critical habitat to support the recovery of an endangered species of fish in New Mexico, U.S. Fish and Wildlife Service
- Summarized existing studies on the role of fish (salmonids) in the Pacific Northwest economy, Pacific Rivers Council

Energy Resources

- Analyzed the economic impacts of the effects of a proposed energy transmission line through Montana and Idaho
- Analyzed the economic costs and benefits of different management options to address the environmental problems associated with waste-coal piles
- Described the potential economic impacts of alternatives for generating electricity in Arkansas, Sierra Club
- Performed a cost-benefit analysis of energy efficiency and renewable energy resources, Alaska Coalition
- Evaluated the environmental externalities associated with electric utility regulation, National Association of Regulatory Utility Commissioners
- Described the impacts of proposed legislation restricting transfer of property between electric utilities, Oregon Public Utility District Association
- Assessed the environmental costs and benefits associated with emissions from one or more generic coal plants in the Pacific Northwest, Bonneville Power Administration
- Provided technical analysis and recommendations concerning incentive electric rates, special services to existing commercial and industrial customers, and recruitment, Emerald People's Utility District of Lane County, Oregon
- Calculated appropriate rates for electricity generated by small independent producers and sold to private utilities, private clients
- Reviewed policies for deregulating small-scale generation of electric power in Idaho, private client

Regional Economic Analysis

Economics of Water Resources

- Analyzed impacts to tourism and fishing due to LNG tankers coming into Coos Bay, Jordan Cove Energy Project L.P.
- Described the economic consequences of strategies proposed in the Columbia Basin Water Management Program, private client
- Detailed the financial implications and considerations of developing a regional wetlands mitigation bank in the Portland metropolitan area, Metro
- Reviewed the methodology for assessing the economic benefits from increased water delivery reliability during major system disruptions, Seattle Public Utilities

- Studied the economic benefits of protecting the water, wildlife, and other natural resources on a stretch of the Upper Mississippi River, private client
- Described the economic conditions in the Columbia River Basin, explained the reasons for the Basin's lagging economy, and highlighted potential transitions the Basin's economy may undergo, Columbia Conversations
- Reviewed the U.S. Army Corps of Engineers' *Final Environmental Impact Statement* on deepening the shipping channel in the Columbia and Willamette Rivers, private client
- Evaluated socioeconomic consequences of ecological restoration projects for the Vermillion River in South Dakota, U.S. Environmental Protection Agency
- Evaluated the economic consequences of alternative management strategies for the Virgin River, Grand Canyon Trust
- Reviewed water management and allocation policies in the Upper Rio Grande, Western Water Policy Commission
- Analyzed the role of the Columbia River in the economy of the Pacific Northwest, Northwest Water Law and Policy Project
- Analyzed the Interior Columbia River Basin Ecosystem Management Project to ensure it internalized the externalities of resource-extraction industries on federal lands in eastern Washington, eastern Oregon, and Idaho, W. Alton Jones Foundation
- Calculated the economic impacts of the Exxon Valdez oil spill on Alaskan businesses and municipalities, private client

Sustainable Economics

- For the Montana Department of Natural Resource Conservation, performed an economic analysis of a proposed land exchange between a private land owner and the state near Whitefish, Montana.
- Examined the economic issues associated with a proposal to mine sand and gravel and construct a new pier and barge facility in a protected marine reserve on Vashon-Maury Islands in Puget Sound, private client
- For a private client, analyzed the potential economic consequences of alternatives regarding state and federal management of fishery resources in the Gulf of Alaska.
- Worked with representatives from organized labor, distressed rural communities, and urban neighborhoods to identify potential new sustainable industries and jobs, Center for Watershed and Community Health
- Developed an analytical framework for integrating resource-conservation and economic-development strategies, Ford Foundation Rural Poverty and Resources Program
- Developed recommendations for ensuring that governmental actions reinforce Oregon's strategic plan, Oregon Economic Development Department
- Evaluated economic issues associated with the Bureau of Land Management's request for a exemption from the Endangered Species Act, U.S. Fish and Wildlife Service
- Analyzed the economic impact of a plant closure and developed a strategy for a community-wide response, Dallas, Oregon, Mid-Valley Council of Governments

- Developed a comprehensive portrait of a corporation's role in Idaho's local and state economies, private client
- Prepared the socioeconomic component of draft environmental impact statements for proposed gold mines in Idaho and Montana, private clients
- Developed procedures for determining the taxable value of residential, commercial, and industrial property, Montana Department of Revenue
- Evaluated opportunities for growth in non-wood manufacturing, Lane County
- Described relationships between land-use policy and economic development, Oregon Department of Land Conservation and Development

Forest Management and the Timber Industry

- Analyzed the pending closure of a lumber mill in northeastern Washington, Wilderness Society
- Developed a methodology for analyzing the economic impacts associated with changes in forest-practices rules, Washington Department of Natural Resources
- Described the economic consequences of sustainable forest management policies in the Southern Appalachia, U.S. Forest Service
- Evaluated the relationships between forested ecosystems and regional economies, National Science Foundation
- Developed a legislative plan for dislocated timber workers, Oregon Joint Legislative Interim Committee on Forest Products Policy
- Analyzed the strengths, weaknesses, opportunities, and threats of cities responding to mill closures, Oregon Economic Development Department
- Assessed the fiscal impact of proposed alterations to timber-sales contracts for state-owned timber, Oregon Division of State Lands

Energy Resources

- Analyzed the socioeconomic issues in the Minerals Management Service's Nantucket Island Cape Wind project draft environmental impact statement, private client
- Compared the potential economic impacts of proposals to build coal-fired electricity generators in Nevada with the potential impacts of one or more alternatives, Western Clean Energy Campaign
- Developed a handbook on the economic factors associated with relicensing a hydroelectric dam, Hydropower Reform Coalition
- Evaluated the feasibility of energy-conservation measures for new homes, Oregon Department of Energy
- Described the economic impact of the development of independently owned, small electricity generators, Oregon Public Utility Commission
- Described the economic impacts of the formation and expansion of public utility districts, Oregon Public Utility District Association
- Analyzed the economic, demographic, fiscal, and community-service impacts of siting a high-level nuclear waste repository at Hanford, Washington Department of Ecology

- Assessed the local economic impacts associated with the construction, operation, and decommissioning of the coal-fired electric generating facility in Boardman, Oregon, Bonneville Power Administration

Expert Testimony

- Analyzed the determination of wages for firefighters in Roseburg, 2007.
- Prepared a declaration on the economic consequences of proposed logging on the Umatilla National Forest subsequent to the School Fire, 2006.
- Provided testimony on the costs and benefits of water use by an energy company on the Hudson River, 2005
- Prepared a declaration regarding economic analysis of the U.S. Army Corps of Engineers' plan to deepen the channel of the Columbia River, 2004
- Evaluated the U.S. Army Corps of Engineers' *Final Supplemental Environmental Impact Statement* regarding the proposed Columbia River Channel Deepening Project, 2003
- Analyzed the determination of wages for firefighters in Coos Bay, 1994
- Evaluated damages stemming from the Exxon Valdez oil spill, 1994
- Evaluated claims that a manufacturer of snowmobiles violated antitrust laws, 1994
- Analyzed the determination of wages for Portland firefighters, 1985

Litigation Support

Economic Damages to Natural Resources

- Conducted a benefit-cost analysis of the State of California's ban on the use of MTBE as a gasoline oxygenate for a NAFTA arbitration matter
- Analyzed the economic damage to homeowners caused by hazardous waste pollution from mining and mineral processing activities
- Determined economic damages sustained from oil spilled from a grounded ship
- Analyzed the economic damages incurred by citizens of the State of Yap, in the Federated States of Micronesia, from a ship that grounded on the coral reef and spilled oil into the mangrove-reef ecosystem
- Reviewed economic analyses, prepared by the U.S. Department of Agriculture and the U.S. Environmental Protection Agency, of the potential economic impacts of court-ordered restrictions on the use of pesticides near salmon-bearing streams in the Pacific Northwest
- Determined the economic damages incurred by a Native American tribe after the building of a river dam
- Calculated the economic damages to the Oregon coast resulting from the abandonment of a section of the New Carissa shipwreck
- Evaluated the economic impacts to municipalities in Alaska of the oil spilled from the Exxon Valdez
- Analyzed the potential economic effects of mandatory medical monitoring for agricultural workers exposed to a toxic pesticide

- Evaluated damage claims by area businesses and property owners affected by a pesticide spill in the Sacramento River
- Calculated damages to a rose nursery from actions by a natural-gas utility

Microeconomic Analysis

- Analyzed the formation of an integrated health care delivery system in the Portland-Vancouver area
- Assisted the City of Coos Bay in its wage arbitration with municipal employees
- Analyzed the market for new frozen-potato products
- Calculated the present discounted value of alleged damages sustained by Chrysler Corporation resulting from actions of a franchisee
- Evaluated patent-infringement claims for agricultural machinery
- Evaluated the economic substance of a property sale-lease-back scheme

Antitrust Economics

- Analyzed relevant product and geographic markets for video superstores
- Evaluated potential antitrust violations by an association of licensed river pilots operating under state regulations
- Evaluated the relevant market, barriers to entry, and degree of competition in the production of maraschino cherries
- Analyzed the relevant market, impact on competition, and damages associated with alleged restrictions on the sale of replacement roller bearings for rock crushers
- Evaluated claims that a natural-gas pipeline corporation violated antitrust laws
- Evaluated claims that the suspension of a physician's hospital privileges constituted a violation of antitrust laws

Economics of Public Policy

- Analyzed the potential condemnation of privately held generating facilities by a publicly owned electric utility
- Evaluated a state's economic interest in recreational fisheries on an Indian reservation and the tribal impacts of state regulation of these fisheries
- Analyzed a public agency's proposed property condemnation, which displaced a planned private-sector development

Publications

Fiscal Year 2008 Large-Cost Fire Independent Review. U.S. Secretary of Agriculture. With Large-Cost Fire Independent Review Panel members: Sharon Caudle, Michael Frank, Richard Haynes, and Ian Munn. June 2009.

An Overview of Potential Economic Costs to New Mexico of a Business-As-Usual Approach to Climate Change. Climate Leadership Initiative, University of Oregon. With Mark Buckley, Cleo Neculae, and Sarah Reich. February 2009.

An Overview of Potential Economic Costs to Oregon of a Business-As-Usual Approach to Climate Change. Climate Leadership Initiative, University of Oregon. With Mark Buckley, Cleo Neculae, and Sarah Reich. February 2009.

An Overview of Potential Economic Costs to Washington of a Business-As-Usual Approach to Climate Change. Climate Leadership Initiative, University of Oregon. With Mark Buckley, Cleo Neculae, and Sarah Reich. February 2009.

Irrigation in Montana: A Program Overview and Economic Analysis. Montana Department of Natural Resources and Conservation. With Sarah Reich, Cleo Neculae, and Mark Buckley. September 2008.

Natural-Resource Amenities and Nebraska's Economy: Current Connections, Challenges, and Possibilities. Nebraska Game and Parks Commission. With Cleo Neculae and Tatiana Raterman. July 2006.

"Future Water Allocation and In-Stream Values in the Willamette River Basin: A Basin-Wide Analysis." *Ecological Applications* 14 (2): 355-367. With D. Dole. April 2004.

"The High Cost of Free Water." *Oregon Quarterly*. With E. Whitelaw. Spring 2003.

"Building Common Ground: Business, Labor, and the Environment in Louisiana." *LUCEC Miscellaneous Publications* (1): 34-44. With P. Templet. November 2002.

The Potential Economic Benefits of Protecting Natural Resources in the Sonoran Desert. With K. Lee. January 2002.

"The Sky Will Not Fall, Economic Responses to Protection of At-Risk Species and Natural Ecosystems." *Fisheries* 27 (1): 24-28. January 2002.

"Bridge Over Troubled Water." Oregon Quarterly. With E. Whitelaw. Winter 2001.

Wildfire and Poverty: An Overview of the Interactions Among Wildfires, Fire-Related Programs, and Poverty in the Western States. With K. Lee. December 2001.

Coping with Competition for Water: Irrigation, Economic Growth, and the Ecosystem in the Upper Klamath Basin. With A. Fifield and E. Whitelaw. November 2001.

Sustainable Practices, Public Buildings, and Jobs. With J. Knight. November 2001.

The Economic Benefits of Renewable Energy and Cost-Effective Energy Efficiency. Alaska Coalition. With E. MacMullan and A. Fifield. September 2001.

Competition Matters: An Economist's Perspective of Collaborations and the National Forests. With E. Whitelaw. January 2001.

Protecting Roadless Areas and Montana's Economy: An Assessment of the Forest Service Roadless Initiative. With A. Fifield. January 2001.

Estimating Streamflows from National Forests in the Willamette River Basin, Oregon. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. With E. Whitelaw. 2001. (6654)

"Bird of Doom...Or Was It?" The Amicus Journal 22 (3): 19-25. With E. Whitelaw and E. Grossman. Fall 2000.

Seeing the Forests for Their Green: Economic Benefits of Forest Protection, Recreation, and Restoration. Sierra Club. With A. Fifield. August 2000.

An Economic Assessment of the Proposed Animas-La Plata Project. With E. Whitelaw. April 2000.

"Salmon and the Economy." *Conservation Biology in Practice* 1 (1): 20-21. With E. Whitelaw. Spring 2000.

Salmon, Timber, and the Economy. Pacific Rivers Council, Oregon Trout, Audubon Society of Portland, and Institute for Fisheries Resources. With E. Whitelaw, M. Gall, and A. Fifield. December 1999.

Salmon and the Economy: A Handbook for Understanding the Issues in Washington and Oregon. With E. Whitelaw, D. Lindahl, A. Fifield, and M. Gall. November 1999.

Assessing Economic Tradeoffs in Forest Management. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. General Technical Report PNW-GTR-403. With E. Whitelaw. Revised July 1999.

The Sky Did NOT Fall: The Pacific Northwest's Response to Logging Reductions. Earthlife Canada Foundation and Sierra Club of British Columbia. With E. Whitelaw and A. Johnston. April 1999.

An Economy in Transition: The Klamath-Siskiyou Ecoregion. With M. Gall and A. Johnston. 1999.

Southern Forests and the Economy: Asking the Right Questions. 1999.

An Economic Assessment of the Proposed Logging Project on the Bering River/Carbon Mountain Tract. 1999.

"An Economic Evaluation of Flood-Control Alternatives in the Vermillion River Basin, South Dakota." *Great Plains Natural Resources Journal* 3 (1). With T. Power. Fall 1998.

The Economic Consequences of River and Wetland Restoration: A Conceptual Manual. With T. Power. 1998.

The Economics of ICBEMP: An Initial Assessment of the Draft Environmental Impact Statement for the Interior Columbia River Basin Ecosystem Management Project. With M. Gall. 1998.

The Ecosystem-Economy Relationship: Insights from Six Forested LTER Sites. National Science Foundation. With P. Courant and E. Whitelaw. November 1997.

An Analytical Typology for Examining the Economic Effects of Ecosystem Management. University of Michigan, School of Public Policy. Working Paper No. 407. With P. Courant and E. Whitelaw. May 1997.

Water Management Study: Upper Rio Grande River Basin. Western Water Policy Review Advisory Commission. With T. McGucken. 1997.

Facing the Tradeoffs: Economic Development and Resource Conservation in Louisiana. With C. Heflin, A. Gorr, and E. Whitelaw. June 1996.

The Potential Economic Consequences of Designating Critical Habitat for the Marbled Murrelet: Final Report. U.S. Fish and Wildlife Service, Portland Field Office. With E. MacMullan, E. Whitelaw, and D. Taylor. May 1996.

Pacific Northwest Regional Economic Elements Affected by Fish Hatchery Management Decisions. Columbia Basin Fish and Wildlife Foundation. With E. Whitelaw. 1996.

Facing the Tradeoffs: Economic Development and Resource Conservation in Louisiana. With E. Niemi, C. Heflin, and A. Gorr. 1996.

Environmental Protection and Jobs: A Brief Survey. With E. Whitelaw. October 1995.

Economic Consequences of Management Strategies for the Columbia and Snake Rivers. Confederated Tribes of the Umatilla Indian Reservation. With E. MacMullan and E. Whitelaw. July 1995.

Integrating Economics and Resource-Conservation Strategies. With E. Whitelaw. June 1995.

The Columbia River *and the Economy of the Pacific Northwest.* With E. Whitelaw, A. Gorr, and E. MacMullan. May 1995.

The Full Economic Costs of Proposed Logging on Federal Lands. With E. Whitelaw. March 1995.

Economic Consequences of an Injunction to Protect Salmon Habitat on the Wallowa-Whitman and Umatilla National Forests: Preliminary Report. With E. MacMullan and E. Whitelaw. 1995.

The Potential Economic Consequences of Critical Habitat Designation for the Lost River Sucker and the Shortnose Sucker: Final Report. U.S. Fish and Wildlife Service, Portland Field Office. With E. MacMullan and E. Whitelaw. 1995.

Economic Critique of the FSEIS on Management of Old-Growth Habitat. With E. Whitelaw. March 1994.

A Method for Estimating the Economic Effects of Habitat Protection. U.S. Fish and Wildlife Service, Portland Field Office. With A. Sullivan and E. Whitelaw. January 1994.

Environmental Externalities and Electric Regulation. National Association of Regulatory Utility Commissioners. With E. Whitelaw. September 1993.

The Potential Social and Economic Impacts of Long Rotation Timber Management. U.S. Forest Service, Pacific Northwest Research Station. With E. Whitelaw. May 1993.

Pacific Northwest Forest-Policy Baselines. Wilderness Society. With E. Whitelaw. April 1993.

"New Conflicts Stir Managers of U.S. Forests." *FORUM for Applied Research and Public Policy* 6 (3): 5-12. University of Tennessee, Energy, Environment, and Resources Center and Oak Ridge National Laboratory. With R. Mendelsohn and E. Whitelaw. Fall 1991.

Transition Strategies for Timber-Dependent Communities. Wilderness Society. With E. Whitelaw and C. Batten. 1990.

New Perspectives and the Forest Service: A New Way of Thinking. U.S. Department of Agriculture, Forest Service. With R. Mendelsohn and E. Whitelaw. 1990.

Investing in Dislocated Families. With E. Whitelaw. 1990.

Looking Beyond the Owls and the Logs: A White Paper. Prepared for Governor Goldschmidt's statewide Timber Summit. With E. Whitelaw. June 1989.

"A Model for Evaluating the Impacts of Forest Management Regulations." *Journal of Environmental Management* 29 (2): 129-144. With R. Mendelsohn and R. Gregory. 1989.

"Oregon's Strategic Economic Choices." In LuAnna McCann (ed.), *Oregon Policy Choices*. University of Oregon, Bureau of Governmental Research and Service. With E. Whitelaw. 1989.

The Economic Impact of Proposed Changes in Washington State Forest Practices Rules. Washington State Department of Natural Resources. With R. Gregory and R. Mendelsohn. February 1987.

Generic Coal Study: Quantification and Valuation of Environmental Impacts. Bonneville Power Administration. With R. Mendelsohn and R. Gregory. January 1987.

Estimating Environmental Costs and Benefits for Five Generating Resources. Co-authored for Bonneville Power Administration. April 1986.

Economic Analysis of the Environmental Effects of a Combustion-Turbine Generating Station at Frederickson Industrial Park, Pierce County, Washington: Final Report. Bonneville Power Administration. With R. Mendelsohn and E. Whitelaw. March 1984.

"Oregon's Land Use Program and Industrial Development: How Does the Program Affect Oregon's Economy?" *Environmental Law* 14 (4): 707-711. 1984.

Economic Analysis of the Environmental Effects of the Coal-Fired Electric Generator at Boardman, Oregon. Bonneville Power Administration. With R. Mendelsohn and E. Whitelaw. 1983.

Review of Methodologies for Assessing the Environmental Costs and Benefits of Acquisitions. Benefit-Cost Analysis and Environmental Impacts: A Review of the Literature and an Evaluation of Methodologies. Bonneville Power Administration. With J. Friedman and E. Whitelaw. 1981.

Analysis and Forecasts of the Demand for Rock Materials in Oregon. Oregon Department of Geology and Mineral Industries. Special Paper 5. With J. Friedman and E. Whitelaw. 1979.

Evaluating Public Expenditures: A Guide for Local Officials. Harvard University, Department of City and Regional Planning. With T. Freeman and P. Wilson. 1978.

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

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Geologic and Hydrogeologic Characterization
Investigation and Remediation Strategies
Regulatory Compliance
CEQA Review
Expert Witness

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certification:

California Professional Geologist, License Number 8571.

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Senior Environmental Analyst, Komex H2O Science, Inc (2000 -- 2003);
- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);

- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a project to provide technical assistance to a comunity adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Lead analyst in the review of numerous environmental impact reports under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions and geologic hazards.
- Lead analyst in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Technical assistance and litigation support for vapor intrusion concerns.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the dischrge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.
- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.

- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

In Fall 2010, Matt taught Physical Geology (lecture and lab) to students at Golden West College in Huntington Beach, California.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F**. 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Geologist licensing examination, 2009-2010.