Zellmer, Ashley@Waterboards

From: Abby Taylor-Silva <abby@growershipper.com>
Sent: Wednesday, June 18, 2014 11:08 AM
To: Zellmer, Ashley@Waterboards
Subject: Agricultural Expert Panel Comments
Attachments: Comments to Expert Panel 6.18.14.pdf

Hello Ashley,
Please accept the attached comments for the Agricultural Expert Panel's deadline of noon today.
Sincerely,
Abby

Abby Taylor-Silva
Vice President, Policy & Communications
Grower-Shipper Association of Central California
abby@growershipper.com
831-422-8844 (p)
831-422-0868 (f)
512 Pajaro Street
Salinas, CA 93901

GROWER-SHIPPER ASSOCIATION
of Central California
Since 1930

Grower-Shipper Association of Central California
"OUR MEMBERS: PARTNERS PRODUCING PROSPERITY"

June 18, 2014

Ashley Zellmer
State Water Resources Control Board
1001 I Street, 15th Floor
Sacramento, CA 95814

Dear Members of the Agricultural Expert Panel,

Thank you for the opportunity to provide further comments to questions 3, 4 and 11 pertaining to surface water. The Grower-Shipper Association (GSA) has detailed at length our concerns with identifying vulnerability and risk using tools and methods that are incomplete, are not designed for a regulatory purpose and aren't updated with current research findings (e.g. broccoli as a scavenger crop).

We've also shared our concerns with identifying risk based upon operation size, stating verbally and in written comment our strong assertion that acreage size is not indicative of a farmer's affect on the watershed, necessitating further regulation. Rather size is many times an indicator that the operation has invested wisely in infrastructure, new technologies and staff to grow crops efficiently and address challenges, including food safety, water quality, harvesting and processing, and much more, with more precise effectiveness.

Generally in regard to determining risk of surface water, GSA has been in favor of a watershed-based coalition approach, much like those in the Central Valley (Region 5). A few key elements we're especially interested in emulating on the Central Coast include:

- Identify locations, through a surface water monitoring program such as Preservation, Inc., where water quality objectives aren't being met.
    - Work with growers in those watersheds to identify factors contributing to objectives not being met and potential sources of exceedences.
- Focus on BMP development and implementation for these growers. Promote current science and establish goals.
    - Conduct reviews/audits of BMP development and implementation to establish compliance.
    - Promote use of innovative, new technologies that have potential to positively influence water quality objectives.
    - Focus on positive actions, including activities that have been in place prior to the order's implementation, instead of inconsistent indicators (i.e. size, crop type).

- Promote education of growers that may be negatively impacting water quality. Identify problem areas using Coalition metrics created with assistance from a Technical Assistance Committee made up of growers and scientists.
- Re-monitor area to establish improvement and/or further identify challenges.
- Allow for Coalition activities to fulfill the Irrigated Lands regulatory requirement.
    - Non-compliance in coalition would be reported to Regional Board, which would then initiate an individual WDR or similar.
- Provide aggregated reports on BMP work, data collection, anecdotal findings and correlations between activities and water quality changes to Regional Board.
    - Discontinue direct reporting of inputs and other sensitive data to the Regional Board. Instead, Coalitions can provide trend and aggregated data reports.

Many of these details were outlined in the report Dr. Marc Los Huertos of California State University Monterey Bay wrote as the "Ag Alternative" to the Central Coast Regional Board's proposed order in 2011/2012. Please see attached a copy of this report from January 31, 2012. Please contact me at 831-422-8844 or abby@growershipper.com with any questions.

Sincerely,

Abby Taylor-Silva
Vice President, Policy & Communications

A Coalition-Based, Farmer Focused Water Quality Protection Program

A Proposed Model to Implement the Conditional Discharge Waiver for Irrigated Farms

Prepared By:
Marc Los Huertos, Ph.D.

With Contributions From:
Julianne Rhodes
Christina David
Maria Osiadacz

1/31/2012

This proposed water quality protection program was developed within a narrow economic, agricultural, political, ecological context of the Central Coast of California and cognizant of the unique stakeholders in the region, thus it should not be applied to other regions or statewide. Although this document was commissioned by Farmers for Water Quality, it represents the viewpoint of the author and not necessarily the views of Farmers for Water Quality nor its leadership, members or member organizations. Any errors or misstatements are the sole responsibility of the author and to that end, suggestions and corrections are welcome.

Executive Summary

This document has been prepared to provide guidance and define the procedures for a 3rd Party Group (3PG) to improve water quality along the Central Coast Region. We were asked to do the following in our report:

- Identify how the 3PG would result in the improvement of water quality when put into practice. Develop a Practice Efficacy Evaluation Plan that can show the effectiveness of certain management practices for improving water quality over time, for groups of integrated discharge points, for the key sources of impairments;
- Develop a robust third-party reporting plan that would: 1) Allow growers to evaluate water quality impairments within an anonymous 3rd party structure and 2) provide the Regional Board with evidence that growers are effectively implementing management practices that are designed to reduce non point source pollution from irrigated lands.

By defining the practices and procedures, we propose a model to protect water quality with the following characteristics: 1) empower growers to lead this effort, 2) encourage privately-raised resources to protect water quality, and 3) provide direct evidence to the Central Coast Regional Water Quality Control Board implemented management practices are effective in reducing non-point source pollution. This plan is one potential model designed to determine the effectiveness of certain management practices for improving water quality over time for groups of integrated discharge points from key sources of impairment. In addition, the Protection Program proposes a robust third-party reporting system that would: 1) maintain the anonymity of on-farm water quality data while 2) providing the Regional Board with evidence that growers are effectively implementing management practices that reduce nonpoint source pollution from irrigated lands. The 3PG is not legal framework to protect discharges who violate Porter-Cologne; thus, the Regional Board will maintain its mandate and capacity to carry out its regulatory requirements. In addition, this proposal will free staff time and resources to enforce the law on negligent dischargers.

The proposed model would be entirely grower funded. The costs are non-trivial to growers. Growers would fund 3GP(s) and pay independent auditors themselves. These costs do not include the practices installed to improve water quality or losses of crop productivity that might be associated with these practices. Nevertheless, the proposal model would require limited investment by the Board Staff and is likely to be more efficient to manage for the state.

Finally, the capacity to maintain high standards is based on the success of other parallel programs in the region and country. For example, Organic certification was originally conceived and successfully enforced by growers.[1] In this proposed model, the 3PG will have the capacity and obligation to remove

[1] It is often assumed that businesses cannot regulate themselves. However, there are many examples where industry takes a leading role to improve practices based on various values, including social, environmental, and economic.

growers from the program who are not in good standing, as well as, require specific action to remain in good standing.

Contents

A Coalition-Based Water Quality Program – Policy Brief

Proposed Regulations to Protect Central Coast Water Quality

Water quality is impaired in surface and ground waters in the Central Coast region of California. Agriculture practices contribute to these impaired water bodies. Existing and proposed regulations to improve water quality along the Central Coast have serious deficiencies. While the existing Conditional Discharge Waiver (*Conditional Waiver of Waste Discharge Requirements for Dischargers from Irrigated Lands, Order No. R3-2004-0117*) was proposed by Board Staff and passed by the Central Coast Regional Water Quality Control Board with exceptional buy-in from stakeholders, water quality improvements as a result of the order have not been documented. In addition, participating growers have become frustrated by the lack of effective enforcement by Regional Board Staff.[2] To create an effective program, it is key to maintain a perception of effective enforcement. Furthermore, the previous program did not demonstrate a marked improvement of water quality.

A more effective policy is required to improve water quality in the region.

This report describes an alternative proposed model to improve water quality in the region that links on-farm practices to water quality objectives defined in the Regional Board Basin Plan. Briefly, the proposed model has the following components:

- Every farm that voluntarily enrolls in the Coalition-Based Water Quality Program that is set forth in the Agricultural Alternative (discussed further under *POLICY OPTIONS*) would develop a suitable Farm Assessment and action Plan (Farm Plan) that documents risk of impairment and management practices to address them. These farm plans would be designed to answer the following fundamental question: "Are practices improving water quality?" To answer this question, the coalition approach would provide evidence of performance measures of practices.
- An independent audit program would be developed to audit every farm in the program to ensure water management practices exist and effectively address potential sources of water quality impairment.
- High priority farms would participate in a practice effectiveness evaluation program designed to improve water quality. By requiring the farm to go through this process, it would allow the audit results to be informed by water quality criteria. These audits would inform the TAC about the sensitivity of the initial audit to water quality criteria.

Recommended Action

We recommend the Regional Board adopt the Agricultural Alternative for October 1, 2012 as a framework for the Agriculture Order Renewal, thus allowing adequate time to develop appropriate organizational structure to implement the program and the start of the water year. We suggest this document, containing a proposed coalition model, be circulated with the expectations that stakeholders

[2] One commentary suggested that Staff time has already been reallocated to address the agricultural waiver and if the Staff recommendations are adopted the enforcement will be more visible and widespread.

make suggestions to address limitations and identify strengths in this document, to ensure the Agricultural Alternative's success to improve water quality

Background

Water quality in surface waters has become impaired in watersheds dominated by agriculture. According the Central Coast Ambient Monitoring Program (CCAMP) and the Cooperative Monitoring Program (funded by growers), water quality impairments include elevated nutrients and water toxicity. Since the adoption of the Conditional Discharge Waiver, water quality improvements have been limited and in some cases, water quality has declined. Although the sources of pollutants are difficult to determine with existing technology and available monitoring funds, agricultural practices can generate runoff that carry pollutants into surface waters or chemical leaching to contaminate ground water or both.

However, it is difficult to generalize the processes that lead to runoff and ground water contamination across the region. Each farm is distinct and uniquely managed. This leads to a terribly complex regulatory context because no single technology or management can be universally, effectively applied to improve water quality. Nevertheless, innovative farmers have adopted many management practices to improve water quality. In most cases, growers rely on practices tested outside the region and without the capacity to measure effectiveness on their farms. This proposed alternative provides incentives to growers to improve water quality within an alternative regulatory approach.

Central Coast Water Quality and Agricultural Production

Developing an effective program to protect water quality has important economic and ecological ramifications. In 2006, the Central Coast Region accounted for 12.3 percent of the state's total food production ($3.2 billion in value),[3] with a complex and competitive marketing structure that limits the capacity for individual farmers to pass on productions costs to consumers. In addition, the production value is not synonymous with profits, profitability the difference between production value and production costs is generally small making farming less than lucrative venture. This context forces growers to be highly risk adverse and hesitant to incorporate management practices with large associated costs or that might jeopardize market access. Subsequently, successful growers rely on innovation to maintain profitability (or solvency in some years). Thus, maintaining the capacity to protect innovative practices remains paramount for some growers.

Water quality is severely impaired in surface waters, and nitrate contamination of ground water has been documented throughout the region. These water quality impairments have economic, ecological and public health implications that must be addressed. Farmers have become increasingly engaged in issues of water quality and are investing increasing resources to improve water quality. However, the development of an effective program to improve water quality would rely on promoting

[3] Henton D, Grose T, Melville J, Aguirre A, Maglinte J, Kurosaka L. November, 2006. California's Food Chain at Work: Agriculture Production, Processing, Distribution and Support. Prepared for the California Economic Strategy Panel (Internet). Available from: http://www.labor.ca.gov/panel/pdf/Food%20Chain%20Report.pdf

an engaged farming community that allows growers to 1) identify water quality risks, 2) implement appropriate and effective best management practices, 3) validate efforts with an independent audit, and 4) evaluate practice effectiveness relative to water quality criteria.

Pre-existing Practices and Policies to Improve Water Quality

Over the last decade, Central Coast farmers have participated in a wide range of programs, both compulsory and voluntary, to improve water quality. These include education and outreach events run by the University of California, Cooperative Extension, resource conservation districts, and other non-governmental organizations. Growers have tested and implemented innovative practices to improve crop production that often improve water quality runoff as well.

Porter-Cologne Water Quality Control Act requires Regional Boards to develop regulations "attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." In addition, "the state must be prepared to exercise its full power and jurisdiction to protect the quality of waters in the state from degradation originating inside or outside the boundaries of the state". Although working in tandem with the Federal Clean Water Act, the state's efforts and authority generally exceeds federal regulatory requirements and enforcement capacity with respect to irrigated agriculture. For example, the definition of waters of the state in Porter Cologne is broader than the definition of a water of the United States and includes groundwater, thereby giving the State and regional boards the authority to regulate discharges to groundwater as well as surface water. Further, state law does not distinguish between point sources of pollution and nonpoint source pollution, thus discharges of pollutants from irrigated agriculture may be regulated, even though the discharge is not considered to be a point source discharge.

After over of year of Board Staff time, the Central Coast Regional Water Quality Control Board adopted the Conditional Waiver on July 9, 2004. As a part of the Conditional Discharge Wavier, farmers developed Farm Water Quality Management Plans (Farm Plans), implemented a range of practices to reduce nonpoint source pollution, and funded a cooperative water quality monitoring program (CMP). However, for the most part, the Cooperative Monitoring Sites do not show evidence of water quality improvement since the monitoring began.

Policy Options

Before the expiration of the Conditional Discharge Waiver (July 9, 2010, following a one-year renewal), Regional Board Staff recommended dramatic changes to the Conditional Discharge Waiver on February 1, 2010 with revised versions or addendums published on November 19, 2010, March 17, 2011, May 4, 2011, and July 8, 2011. The Regional Board has not been able to take action on the Staff recommendations because of a lack of quorum.

The Staff recommendations rely on a three-tiered system, where each higher tier has increasing management and reporting requirements. The tier system recommended by the Board Staff is relatively simple; a farm is categorized into Tier I, II or III based on size of farm, use of chlorpyrifos or diazinon,

proximity to an impaired surface water body, with crops that have a high potential to leach nitrate, and proximity to a contaminated drinking water supply well. The most stringent tier (Tier III) requires individual water quality monitoring and reporting. The Board Staff recommendations allow third party group to assist in the development of farm plans and to implement monitoring, however, individual monitoring results appear to be required. In addition, the Staff Recommendations require ground water well monitoring results to be reported.

Besides the reporting requirements, Board Staff have mandated management practices some of which vary associated with tier system. For example, all dischargers are required to maintain naturally occurring, riparian vegetation and destroy abandoned ground water wells, while Tier III dischargers must meet specific nitrogen balance ratios (e.g. 100 percent for cool-season vegetables and 120 percent for strawberries and raspberries.)

To determine compliance, Staff recommends that the Water Board evaluate various types of information a) management practice implementation and effectiveness, b) treatment or control measures, c) individual discharge monitoring results, d) receiving water quality monitoring results, and e) related reporting. For example, Tier III growers must report individual monitoring results to the Board. Compliance with the Order would be partially evaluated by submissions of the reports and water quality results. Failing to report and/or failure to meet beneficial uses are subject to further actions including monetary fines.[4]

As a response, Farmers for Water Quality proposed an alternative to the Staff Recommendations to 1) address weaknesses in the original Discharge Waiver and 2) as an alternative to the Staff recommended changes to the Discharge Waiver. Revisions to this alternative were presented as Attachment B and is referred to as the Agricultural Alternative. “Instead of relying on mandated practices, reports and edge of field monitoring as proposed in the Staff Recommendations, the Agricultural Alternative proposal (March 17, 2011, revised May 8, 2011) provides for an alternative approach whereby individual growers may voluntarily elect to participate in a Coalition-Based Water Quality Program that includes an audit program to verify and validate grower compliance of effective management practices.[5] Instead of relying on a tier system to assess water quality risk and identify required management practices, the Farmers for Water Quality proposal (March 17, 2011, revised May 8, 2011) relies on an independent audit program to verify and validate compliance. The proposal allows growers to implement appropriate practices based on their farming operation. Further potential details of this program have been under development since the Agricultural Proposal was submitted in May 2011 and are included in this document.

[4] It is not clear how conflicting beneficial uses are weighted. For example, water used for irrigation would not meet drinking water standards without significant treatment. Can water that has been used for one beneficial use be able to meet other beneficial uses simultaneously? There seems to be a significant lack of clarity in how the term beneficial uses can be applied to waters that have multiple designations.

[5] The Agricultural Alternative in its totality is comprised of several documents, all of which are posted on the Central Coast Water Board’s website and identified as such.

The Agricultural Alternative relies on several discrete activities, but relies wholly on Third Party Group(s) (3PG(s)). The 3PG would maintain a list of participating growers that would agree to the following activities: 1) implementation of management practices with the goal to achieve compliance with water quality standards, protect beneficial uses, and prevent nuisance; 2) growers would identify risk with 3PG to the following four categories of water quality: toxicity and sediment in storm water; toxicity in irrigation runoff; nutrient in irrigation runoff; and nitrate leaching to ground water; and 3) growers would be required to be subject to an audit to verify compliance and track improvement. Finally, the 3PG would promote additional site-specific studies to continue to improve practice effectiveness and reduce water quality impairment risks.

One other alternative entails the use of a marketing agreement. A marketing agreement relies on voluntary participation and often linked to standards of performance. In general, the marketing agreement approach was initially attractive, but was not pursued in this document because of a number of unresolved questions. Geographically-based market orders could not be created as the sole 3PG entity because said 3PG would not be able to cut across commodities or geographic boundaries. If a geographical market order cannot be created, then, it may be worth considering whether commodity organizations can incorporate agreement into their existing state charters. The institutional structure of the market agreement could follow much of what has been outlined in the 3PG alternative; however, the motivation (i.e. incentives) may increase participation levels because it provides access to market. For example, grower proposed water conservation or water quality improvements would have preferential ranking for additional growing acreage.

Advantages and Disadvantages of Each Policy Option

Risk Should Be Evaluated on the Farm Scale

Based on research experience of on-farm measures of water quality, sources of water quality impairment tend to be unequally distributed across the landscape and through time. Water quality issues can vary in surprising ways, where some farms are water quality issues that easily documented and characterized (in terms of variability in time and space), while others require significant effort to understand water quality risks. Understanding these sources of impairment at the farm scale provides a robust understanding of the processes that lead to water quality impairments in receiving waters. In addition, some risks associated with water quality impairments can be identified at the ambient water quality sites effectively (e.g. Cooperative Monitoring Sites) but do not provide growers information needed to mitigate the sources of impairment. Therefore, the Agricultural Alternative assumes that risks should be evaluated on a farm level.[6] There are examples of effective risk evaluation at the sub-

[6] There might be some capacity to combine several farms into a single unit for the purposes of this program. A group of growers might justifiably combine their farms to develop a risk analysis because the number of common practices and water quality concerns are nearly identical and practices are equally effective for each farm. Therefore, there may be times that a group of farms work together to accomplish the goals of this document.

watershed level, where crop-type and management practice are homogenous[7]. Unfortunately, few sub-watersheds along the Central Coast have these characteristics. The Staff Report takes a more landscape-level approach to risk by categorizing farming size and locations (and some specific management practices) into a tier system. The evidence used for this system is based on the impairments associated with the Cooperative Monitoring Sites and "idealized" cultural practices for various crop types. The Board Staff-recommended tier system is attractive because of its simplicity. However, Staff categories may not provide a risk assessment that identifies the farm-level sources of impairments (e.g. even small farms that do not use pesticides have the potential to generate high levels of erosion, which can be sources of toxicity in receiving waters[8]). Thus, we propose water quality impairment risks should be assessed at the farm scale. The Agricultural Alternative explicitly indentifies and measures risk at the farm scale, while the Staff recommendation base risk on a tier system that requires farm-scale monitoring only if the tier requires it.

Risk Assessment Should be Performed by Growers and Independently Audited

Growers know the cultural practices used to produce a successful crop. In many cases, the growers are highly innovative and cultural practices may evolve quickly. In particular, the speed of innovation may exceed the capacity for the Region Board to identify sources of impairment or develop appropriate responses in a timely fashion. With a properly developed Farm Assessment and Action Plan template, growers would be able to identify risk with greater accuracy than a landscape analysis of water quality impairments, crop type, or pesticide use reports. However, to provide legitimacy, grower assessments should be subject to an independent audit to provide an unbiased and repeatable assessment of water quality risks.

To ensure objectivity, the audit process must be completely independent. Based on this model the growers hire the auditors, but the auditors themselves will be independent of the farm business (i.e. an independent contractor). The development of a training and certification program will be an important task for the 3PG to ensure that the audit process is both objective (i.e. unbiased) and consistent (i.e. audit process is both well constrained) and reliable (i.e. auditors are well trained).

[7] One recent (Winter 2012) commentator proposed is to have the TAC coordinator or members to visit each farm in the program to develop the assessment and action plan. This approach has been very effective to limit pesticide loading in surface waters some other coalition approaches. Obviously, this would increase the role of the TAC and would likely change the costs but might be a good approach.

[8] I assume Board Staff have successfully linked farm proximity and estimated on-farm chemical uses to water quality impairments at a landscape level. These are important patterns that describe water quality impairments; these linkages may have a cause-effect relationship, but without a rigorous statistical analysis, which I have not seen, the relationship should be characterized as a correlation, not a causation. In other words, there may be other explanations for water quality impairments than proximity to farms to streams or on-farm use of chemicals.

Growers Can Respond Appropriately to a Valid and Confidential Risk Assessment

Whether part of a Farm Water Quality Assessment and Action Plan or an independent audit, growers can acknowledge on-farm risk when it is developed without fear of litigation or other regulatory responses (e.g. fines).[9] We believe that a risk assessment would have more integrity, i.e. representative and unbiased, if it were confidential.[10] A confidential risk assessment would provide growers a baseline assessment from which to respond with the flexibility needed to address specific sources and practices within their operations. The Farm Plan can then implement practices based on valid risk assessment.[11] We assume that growers, armed with knowledge of their contribution to water quality impairments, would take the necessary action to meet Basin Plan Objectives. In addition, by providing a context of confidentiality, growers who manage high-risk farms would be able to participate in a Practice Effectiveness Evaluation Program that provides evidence of water quality improvements. Finally, growers have the capacity to "cooperate" with other dischargers to address similar water quality concerns without being subject to public scrutiny that might discourage cooperation.[12]

[9] These threats should remain an option for non-compliant or negligent growers.

[10] Risk assessment directly linked to regulatory response is attractive for policy makers because it links cause and effect. However, in the context of high spatial and temporal variation, risks that cause nonpoint source pollution can be easily misrepresented. The motivation (by the regulated or the regulator) stakeholders to misrepresent "cause" increases with a tight regulatory link between cause and effect. For example, the selection of irrigation runoff events or locations can be biased to minimize perceived impairment risks unless a quality control and assurance plan is extremely detailed, which require a very high level of micro-management by Board Staff and dramatically increase grower costs. Thus, staff recommendations for monitoring and reporting may fail to provide high quality and objective data quality needed to track grower progress to meet water quality goals. In addition, if Board staff are put into the position of monitoring farms, it will create divisive cause and effect such that waters sampled might or might not be associated with the farm in question, e.g. tile drains may not reflect grower practices but basin wide activities.

[11] In addition, combining farms into a single risk assessment, growers may also develop a coordinated management plan as a more effective way to address sources of impairment.

[12] For example, using the Board Staff-recommended tier system, it is not clear why a Tier 1 grower would cooperate with a Tier 3 grower to address a significant discharge issue in a watershed, such as sediment transport. In fact, in contrast to working together, there may be active animosity and lack of cooperation because of the tier approach.

Self-Enforcement is More Efficient and Effective[13]

One of the weaknesses of the current Conditional Discharge Waiver is its reliance on Board Staff for enforcement. Not only has the Staff appeared slow to enforce Discharge Waiver requirements (e.g. follow-through with growers who have not submitted NOIs), the free-rider[14] effect has damaged grower trust in an equitable enforcement policy. Finally, some growers may be administratively non-compliant, but are pro-active about water quality management or not significant dischargers.

Using the 3PG approach, growers can opt to participate in a program that provides confidence in a predictable enforcement arena. In addition, by developing policies within the 3PG, accountability policies would be explicitly accepted by participants of the program. Furthermore, growers that have been administratively non-compliant but proactive about water quality management or non-significant dischargers can be actively recruited into the program without fears of financial or criminal penalties.[15] As part of the audit program, 3PG(s) would have the capacity to drop participants that fail to meet program policies. For the Board Staff, this could dramatically reduce the population size[16] required by staff to determine compliance, thus saving public expenditures.

Practice Effectiveness Evaluation Program Links Farm Risk to Water Quality Criteria

The Practice Effectiveness Evaluation Program explicitly links *both* risk assessment and practice effectiveness evaluation to water quality criteria. At the request of the Farmers for Water Quality, we designed this Evaluation Plan as a model program consistent with the proposed language set forth in the Agricultural Alternative. In particular, the Agricultural Alternative includes a provision that would allow 3PG(s) to conduct on-farm evaluations to determine the effectiveness of management practices relative to the water quality criteria. This document provides a proposed model where a 3PG would

[13] It is important to note that the use of the phrase "self-enforcement" is not meant to suggest that the Water Board abdicate it's statutory authority to implement Porter-Cologne. It is to suggest that growers can hold themselves accountable to the requirements defined within the 3PG structure. The ability and responsibility to enforce water quality regulations remains with the Water Board and credible enforcement is key for the success of the program.

[14] In this case, free-riders are defined as growers that have failed to submit NOIs and pay associated fees. They may, however, have developed Farm Plans and/or may not be significant dischargers.

[15] Some believe that the goal of regulations is to generate fear which in turns generates the motivation required to meet regulatory requirements. The evidence for this is not well documented in the literature and should be thought of as a hypothesis at best. However, more important is that the way the Tier system is structured, the growers that have the highest compliance requirements have the greatest level of fear – thus the incentives to comply are highly asymmetrical with respect to grower investments to improve water quality. Thus, fear as a motivator is mis-directed toward higher compliance growers.

[16] The types of participants would likely change too. Growers electing to participate in the 3PG would likely be actively involved in issues of water quality. Thus, the Board Staff can focus its efforts on growers that have taken advantage of the free-rider effect.

353 simultaneously protect the innovative business practices while providing evidence that water quality
354 protection goals are met.[17] For example, additional opportunities exists to achieve beneficial uses and
355 load reductions through the creation of artificial wetlands, vegetative treatment systems, and the
356 restoration of degraded and lost creek and wetland habitat in the regions vast network of drainage
357 channels and historic creek systems[18].

358 As part of the 3PG model proposed here, participating growers would develop a Farm Assessment
359 and Action Plan (Farm Plan),[19] which identifies water quality impairment risks for each farm they
360 manage and the practices implemented to reduce these risks. Based on a random selection process,
361 growers would be subject to an independent audit. The audit results can be used to rank farms in terms
362 of their potential contribution to impair receiving waters (surface or ground). Using this information, the
363 10 percent of high priority farms[20] should be subject to a two-year Practice Effectiveness Evaluation,[21]
364 using water quality criteria. The Practice Effectiveness Evaluation would be overseen by the 3PG staff
365 who would enlist appropriate resources (e.g. public and private expertise, cost-share programs) to test,
366 implement, and evaluate management practices designed to improve water quality. The evaluation

[17] The Water Quality Objectives are described below as part of Water Quality Criteria. These criteria are parallel to Beneficial Uses defined in the Basin Plan. To meet Basin Plan Beneficial Uses and address impairment concerns at Cooperative Monitoring Sites, we propose the use of criteria (less to more stringent) to gauge practices that address water quality concerns.

[18] Vegetated drainage systems provide documented water quality enhancement of surface waters once the waters have left the individual farm parcel. These waters and their pollutant loads flow though a network of un-vegetated creeks and drainage networks that provide neither filtration and pollutant uptake nor valuable freshwater wetland habitat. Recent studies on the Central Coast have documented the improvements in ambient water quality in agricultural settings of a combine approach of on-farm pollutant reduction practices and potential enhancement of wetland habitat of adjacent drainage systems. Currently, few incentives exist for growers to manage for wetland habitat. Within the current Board Staff recommendation, there is no incentive for growers to implement these off-farm activities.

[19] Existing Farm Plans as developed for the original agricultural waiver are not well suited to an audit system and would need to be revised and updated. For example, Farm Plans should be web-based to facilitate on-line submission to allow growers to update them and auditors to access them more easily. The full name of the Farm Plan is the Farm Water Quality Assessment and Action Plan to emphasize the distinction.

[20] Several commentaries have suggested that a watershed-based approach might be more effective. In general, using a watershed approach can be very effective. It is my contention that the problem may be distributed as a few parcels in several watersheds and this would address the sources of highest concern, thus address the problem better than working with several dozen ranches where only one or two might be the contaminant source. However, perhaps a hybrid model might be appropriate – where parcels are selected or grouped by risks within a watershed. These details should be addressed by the 3PG governing body.

[21] In most on-farm studies, the longer the evaluation periods, the more effective the practice can be implemented. Two years is proposed here for convenience and simplicity. However, the 3PG may decide that shorter or longer periods to evaluate practices may be more appropriate.

would have the flexibility to address a robust range of potential causes and/or specific sources of impairment. Changes in water quality that are specific to criteria in this document would be used to evaluate the success of the program and on-farm practices and what improvements could be made.[22]

Staff Response to Agricultural Alternative

Board Staff commented "the Agricultural Alternative Proposal would be less stringent than the current 2004 Ag Order and would not sufficiently address the severe water quality conditions in agricultural areas and the significant impacts to water quality resulting from agricultural discharges." While Board Staff agrees that some agricultural representatives have made substantive changes to their previous recommendations, their comment fails to recognize the value of the independent audit program or the detail provided in this document, linking impairment risk, management practices, an independent audit, and the practice evaluation program. Taken together, the Agricultural Proposal not only exceeds the 2004 Agricultural Discharge Waiver, it might be likely to be more robust (and stringent) than the Staff recommendations. Specifically, the risk assessment would be more vigorous and a built-in structure for accountability via the audit program provides a dynamic analysis of growers unlike any other program in the State. Under the Staff recommendations the enforcement criteria are ambiguously described and the costs of staff time to process the reporting requirements for Tier III growers could become a large burden. Furthermore, the enforcement language generates more fears and uncertainty in the business community,[23] which has led to some mistrust and questions about the validity of the process as a whole.

[22] In contrast to publically funded practice evaluation programs, such as EPA 319h grants, this program has the potential to be privately funded, through the 3PG participants. Given the limited availability of public funds and the relatively low efficiency of public dollars to meet desired goals, this program could be a model cost-effective approach to improve water quality.

[23] The most successful regulations have clear and predictable costs associated with them.

Proposed Model to Implement the Agricultural Alternative

Farmer's for Water Quality described and proposed an alternative Attachment B to the Central Coast Regional Water Quality Control Board in March 2011 and a revised document in May 2011. For clarity, the revised document is referred to as the Agricultural Alternative. Instead of basing the program on a tiered approach, the Agricultural Alternative focused on the development of an independent audit program and practice effectiveness evaluation program, but the details were not explicitly defined.

Based on this Agricultural Alternative and discussions with growers and agricultural representatives, the proposed model described here was designed to provide details that might guide the development of the Agricultural Alternative. Because of time constraints in the development of the document, we expect this proposed model to evolve as more stakeholders become engaged and provide critical comments.

Preferred Policy Considerations

In general, there are a number of policy options to protect the environment that range from "command and control" regulations to market-based approaches. Due to the time constraints, we were unable to fully explore all of the available options, but to the extent possible this proposal was developed with the intention to create room for an incentive-based approach. For incentive-based approaches to work, the regulated industry or population should be able to see that various management practices can be rewarded without threat of being penalized. By providing grower the capacity evaluate farm risks and practice effectiveness evaluation anonymously, the Agricultural Alternative provides this context.

More specifically, this proposed model was developed with the following guidelines articulated by the Mission Statement of Farmers for Water Quality:

> *Our objective is for third-party groups to work directly with growers throughout the Central Coast to provide assistance in identifying and implementing appropriate management practices to improve water quality and comply with water quality standards, while providing accountability to the Regional Board and the public in general by ensuring that third party group grower members and their agricultural operations are subject to technically-sound, scientific and objective verification audits.*

We were asked to do the following in our report:

> *Identify how the 3PG would result in the improvement of water quality when put into practice. Develop a Practice Efficacy Evaluation Plan that can show the effectiveness of certain management practices for improving water quality over time, for groups of integrated discharge points, for the key sources of impairments.*

> *Develop a robust third-party reporting plan that would: 1) Protect the anonymity of the growers and 2) Provide the Regional Board with evidence that growers are effectively implementing management practices that are designed to reduce non point source pollution from irrigated lands.*

This Proposed Model has been prepared to provide guidance and define the procedures for the development of a Third Party Group (3PG) to address water quality along the Central Coast Region. Based on the Agricultural Alternative Proposal presented to the Central Coast Regional Water Quality Control Board (Regional Board), this Proposed Model identifies how a 3PG can be structured and operated to improve water quality in the region. There is a diverse range of possible structures for a 3PG and the models presented here represent a subset of possible options.

Description of Proposed Model

This proposed model links on-farm practices to water quality objectives defined in the Regional Board Basin Plan. In summary, the proposed model has the following components:

- Required Auditable Farm Assessment and Action Plans: Each farm would have a farm plan that has been specifically designed to 1) allow farmers to assess water quality impairment risks to both surface and ground waters and 2) document the use of best management practices to reduce risk.
- Independent Audit Program: Each farm would be subject to an independent audit that verifies and validates the contents of the farm plan. Twenty percent of the farmers would be selected for an audit annually, so that over the five years every participant would be audited. If the risk assessment is inadequate or there is a failure to install best management practices, the farm would fail the audit. To remain in the program the grower must change the farm plan or implement effective management practices. Growers failing to pass the audit would be dropped from the program and they would need to comply with Porter-Cologne in another manner, to be determined by the Regional Board. For farms that pass the audit, the program would provide the Regional Board with a list of participants in "good standing".[24]
- Selection of High Priority Farms: The effectiveness of best management practices is highly variable, thus impairment is likely to remain a potential risk. Through the audit process, high priority farms would be identified for follow up with the Practice Effectiveness Evaluation Program. The 3PG will develop these criteria, which may be based on a combination of impairment risks and receiving water quality.
- Practice Effectiveness Evaluation Program: Farms identified as a high priority to impair surface waters would undergo the Practice Effectiveness Evaluation Program (PEEP). This program would evaluate practices against selected water quality criteria set forth in the Basin Plan. The PEEP would provide evidence that growers implement management practices to meet water quality criteria and indentify areas of research needed to improve water quality further. In addition, the conclusions of the PEEP could be incorporated into the farm plan requirements and audit

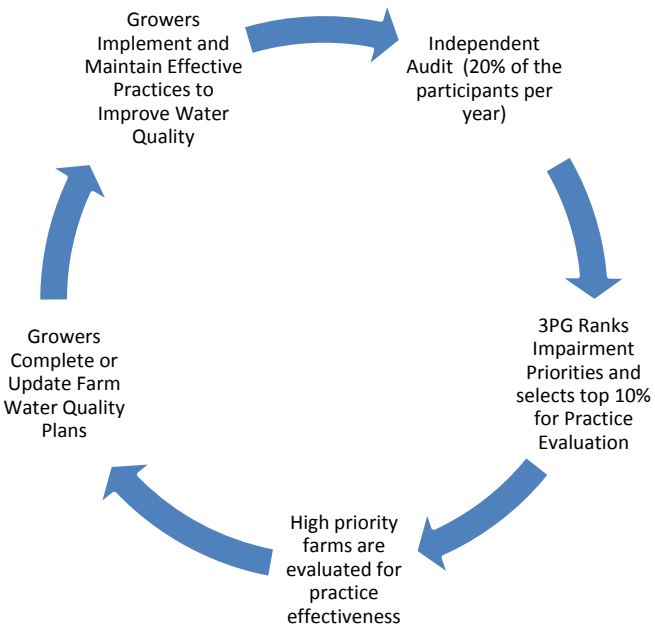
[24] There has been a fair amount of discussion about what to do if a grower puts out a good faith effort or more and is still unable to meet water quality objectives. Is the grower kicked out of the program? In the way we have framed this, the grower remains in the program. This is advantageous because now the grower and installed practices might be subject to a project effectiveness evaluation to determine why the practices are not working and investigate whether other BMPs might be more appropriate and effective.

program. The program should be seen as a cycle to address water quality impairments rather than a penalty or disincentive.

Process Flow Cycle

The process flow chart visually illustrates how growers in "good standing", those who develop and update their farm plan based upon 3PG recommendations, install appropriate best management practices. Each grower over the life time of the Discharge Waiver would be subject to an independent audit. If the audit shows that a farm is characterized as high priority, then the grower would agree to a practice effectiveness evaluation to test and improve management practices and reduce the risk to impair surface and ground water. The results of the PEEP may then be used to improve the farm plan templates and audit process as new information is made available regarding the effective reduction of impairment risks.[25] Because these steps are interlinked, the development of the Farm Plan, Practice Implementation Plan, Audit Program, and the Practice Evaluation Program requires a coordinated approach. Based on recommendations by the TAC, the 3PG's governing board would provide the structure, appropriate content, and coordination for each of the entities: growers, independent auditors, and practice evaluators.

As part of the 3PG proposed by Agricultural Alternative, this proposed model would provide growers with feedback needed to judge the value of practices designed to improve water quality. Thus, by providing a mechanism to identify growers who would benefit most from these activities and provide evidence of pollutant reduction, this program promotes water quality improvements without threats of financial penalties or additional Staff enforcement time.



Structure of Proposed Model

The proposed model would be coordinated by a 3PG or consortium of 3PGs as a non-governmental organization (NGO), with several staff members. A 3PG would be composed of appropriate members to adopt and implement

[25] A reoccurring criticism of the proposed model is number of entities involved in the verification and education process, creating a cumbersome approach. We welcome suggestions to develop a simpler model that continues to meet goals of the program and may be less expensive to run.

policies and procedures to address water quality. The 3PG may be composed of a consortium of commodity groups, growers, and/or other potential stakeholders.[26] The Evaluation Plan assumes that the governing body of a 3PG is composed primarily of growers and minimal hired staff. The governing body of the NGO would be composed irrigated lands farmers in the region who are regulated by the agricultural waiver and are members of the third party group. who would make policy and business decisions. The governing board would be made up of no more than eight (8) members. All governing board members would also be voting board members and have irrigated lands in the region and be assessment-paying members in good standing in the 3PG. There might also be non-voting Board Members from the research and conservation community to ensure transparency in the process. Meetings would be open to the public, it would offer the capacity to go into closed session for Governing members, should a legal, personnel, or other appropriate confidential discussion be needed.

There would be two advisory committees to the Board: Technical Advisory Committee and a Public Advisory Committee.

The Technical Advisory Committee (TAC) would provide the 3PG governing body with recommendations on how to implement the program. In particular, the TAC would recommend the content of an auditable Farm Water Quality Plan (Farm Plan), guide the development of the metrics for an independent audit program, and oversee the practice effectiveness evaluation that link practices to water quality criteria. The TAC members would be selected by the Board and make recommendations to the Board, which will follow the intent of the 3PG's mission statement. More details concerning the TAC are described in Appendix H: Technical Advisory Committee (p. 53).

The public advisory committee (PAC) would be designed to ensure public stakeholders can evaluate and recommend program improvements with broader public goals to protect surface and drinking waters. The PAC members would be selected by the Board and make recommendations to the Board, which will follow the intent of the 3PG's mission statement. More details are described in Appendix I: Public Advisory Committee (p. 55).

Finally, the 3PG would submit summary reports to the Regional Board on an annual basis. These reports would document the names and farms enrolled in the program, a summary of water quality risks and management practices installed to improve water quality, the results of the independent audit and finally, the results of the practice effectiveness evaluation program. The proposed program documentation and reporting procedures are described in Appendix G. Documentation and Reporting (p. 51).

[26] It is beyond the scope of this proposal to provide the details on the formation of the 3PG. The legal entity status (e.g. non-profit organization, quasi-governmental agency (e.g. state commissions), or an internationally recognized standard (e.g. ISO)) members of the governing board (growers, commodity representatives, or public representatives), and relationship between the 3PG and the Regional Water Board would influence how this document is used. These questions are being addressed by the Farmers for Water Quality. For the purpose of this document, we assume the governing board is made up of growers or grower organization representatives and run something akin to the Central Coast Coalition for Water Quality.

In summary, the 3PG would promote effective management practices and report the effectiveness of these practices to the Board. This proposed model provides a robust reporting plan that would: 1) provide the names of growers in good standing in the third party group and provide aggregate data (i.e. data are not linked to the farm or individual growers) and 2) provide the Regional Board with evidence that growers are effectively implementing management practices that reduce nonpoint source pollution from irrigated lands.

Background Motivation and Assumptions

Steps toward Preparing the Water Quality Practice Evaluation Plan

This Coalition-Based Water Quality Improvement Plan (Proposed Model) has been developed in collaboration with growers participating with the Farmers for Water Quality. We have met with a range of stakeholders, including growers and representatives of grower organizations. In addition, portions of this Proposed Model have been described to Board Staff in an effort to get feedback and suggestions for program success. The range of suggestions and possible models is wide. To distill these ideas into a coherent document, we made logical but not definitive decisions concerning how the 3PG might implement the Agricultural Alternative. It is important to consider this document as one of many potential models and as a point of departure in the development of 3PG(s). Details of the Proposed Model would be further developed by the governing board of a 3PG. In addition, the relationships between the 3PG and Water Board and Board Staff have not been defined because it was beyond the scope of this document.

Additional components and details of the program are included in the appendices:

- Appendix A. Logic Model
- Appendix B. Water Quality Indicators and Criteria: Defines how water quality indicators would be used to develop water quality criteria and defines selected water quality criteria to evaluate the 3PG program.
- Appendix C. Patterns and Process of Water Quality Impairments: Scale and Implications: Summarizes the common sources of impairment associated with agriculture that would be captured in the risk analysis with specific implications to farm management.
- Appendix D. Components of a Auditable Farm Water Quality Plan: Describes what might be included in a Farm Plan, including how farms could be assessed for water quality risks.
- Appendix E. The Audit Process: Describes a proposed independent audit program to validate the Farm Plan's accuracy and implementation.
- Appendix F. Practice Effectiveness Evaluation : Describes the program to improve management practices from high-risk farms and improve practice effectiveness.
- Appendix G. Documentation and Reporting: Describes the how the program would provide evidence of compliance and progress to meet beneficial uses and protect grower confidentiality.
- Appendix H: Technical Advisory Committee: Describes the role and makeup of the Technical Advisory Committee

- Appendix I: Public Advisory Committee: Describes the role and composition of the Public Advisory Committee.
- Appendix J. Steps to Develop a Quality Assurance Program Plan: Describes the process to develop high quality data for reliability and repeatability.
- Appendix K: Cost Estimates for
- Appendix M: Ground Water Work Group Proposal

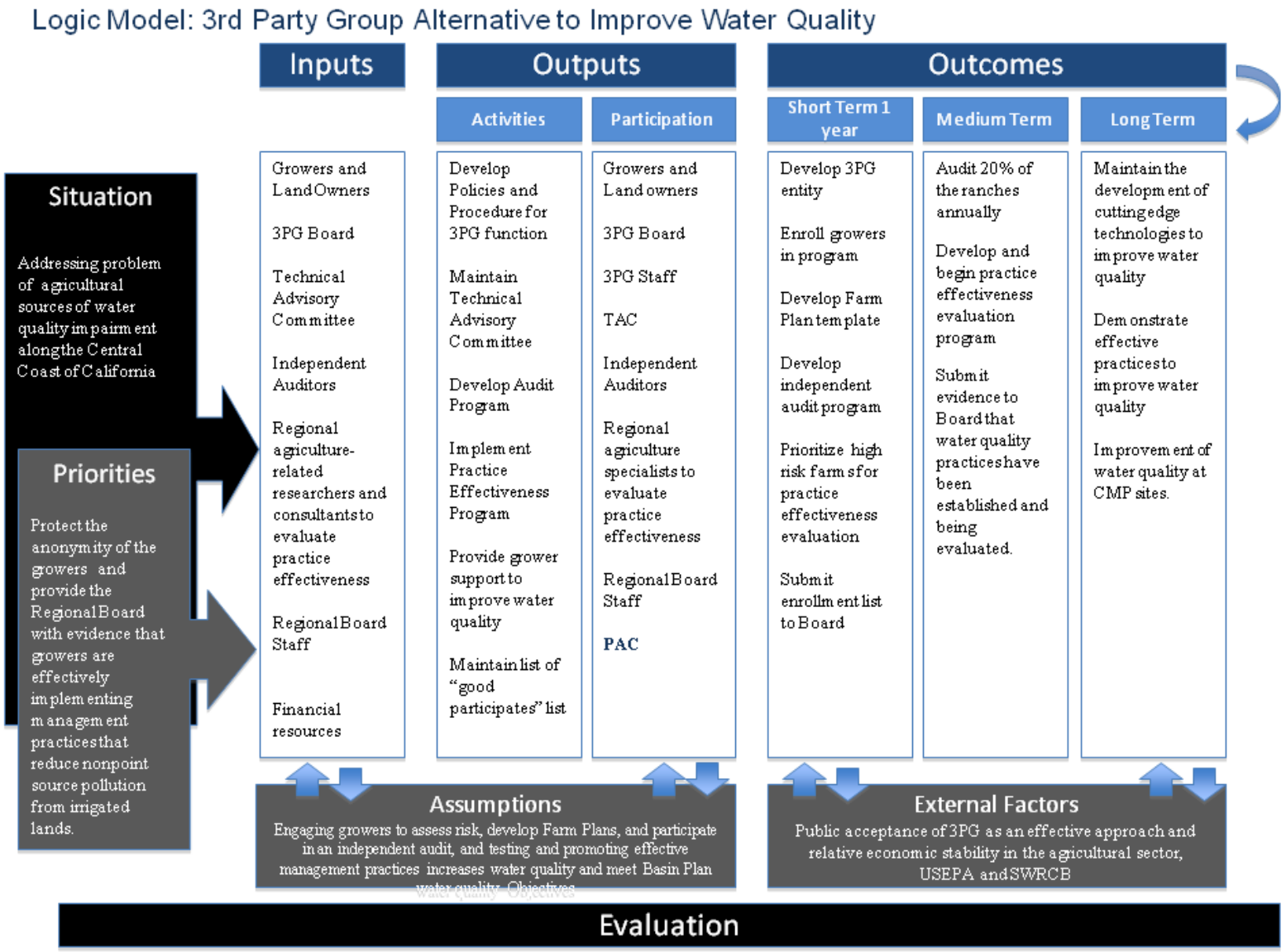
3PG Program Effectiveness

The goal of the program is to improve water quality related to agricultural use, drinking water and aquatic life.[27] Assessment of program effectiveness could be conducted between the 3PG(s), the TAC and the Board prior to the renewal of the next Discharge Waiver.[28] Developing milestones on this area would require good communication between the Board and 3PG(s). We believe it would be advantageous for the 3PG(s) to develop strategies and policies to demonstrate success within the 5-year period so that the program can carry on and be included in each Discharge Waiver Renewal. This Proposed Model was includes activities to develop a successful program beyond the next Discharge Waiver renewal cycle.

[27] Other beneficial uses have been suggested by some reviewers, such as "swimmable". The only reason we chose three was to keep the program simple and capable of responding a range of beneficial uses. These might be further refined by the 3PG governing body or as a response to recommendations by the Regional Board.

[28] This document is partially constrained by historical development of the Board Staff recommendations and Regional Board hearings. Without this context, this proposal might simpler in structure and easier to implement. We support efforts to suggest 3PG models with fewer bureaucratic components. However, we believe this Evaluation Plan would improve water quality and may exceed the legal requirements of the Board to implement state and federal laws. By evaluating the 3PG program effectiveness prior the next round of Discharge Waiver "negotiations" may serve both the grower and Board Staff resources.

Appendix A. Logic Model



Appendix B. Water Quality Indicators and Criteria

Water Quality Indicators

The 3PG would use scientific, practical and programmatic considerations to develop criteria for selecting water quality indicators. These indicators may be used to determine water quality risks and evaluate and report the performance of the cultural practices and water quality improvements. In an effort to develop a practical (i.e. cost effective) and scientifically valid program, indicators would be used within the constraints of the evaluation program.

The existing Cooperative Monitoring Program (CMP) has been providing the Regional Board with quarterly reports summarizing the findings of their long-term monitoring program, as well as of follow-up activities. The reports provide specific scientific data regarding depth and discharge of streams, nutrient concentrations, organophosphate pesticide concentrations associated with water column toxicity, detailed characterizations of source areas for constituents of concern and most recently, sediment pesticide concentrations associated with sediment toxicity. This Evaluation Plan proposes to use similar scientific, practical and programmatic considerations to develop criteria for selecting water quality indicators. These indicators would be used to evaluate the performance of the agriculture proposal as the basis for determining whether water quality improvements are made.

Of primary importance is that the water quality indicators demonstrate practice effectiveness and success in an unambiguous way for the agricultural industry and the Central Coast Regional Water Quality Control Board. Table 1 lists the criteria and consideration taken into account when determining appropriate water quality indicators.

Table 1. Criteria for Selection of Water Quality Indicators for Practice Effectiveness Evaluation (Adapted from Intergovernmental Task Force on Monitoring Water Quality. 1995. The nationwide strategy for improving water quality monitoring in the United States. Final Report of the Intergovernmental Task Force on Monitoring Water Quality Technical Appendix E. Open File Report 95-742).

Criteria	Definition(s)
	Scientific validity (technical consideration)
Measurable/ quantitative	Feature of practice effectiveness that is measurable over time; has defined numerical scale and can be quantified in either the field or laboratories that are not costly or complex analyses to run.
Sensitivity	Responds to range of conditions and management practices within an appropriate timeframe; sensitive to potential practices being evaluated.
Resolution/ discriminatory power	Ability to discriminate meaningful differences in environmental conditions with an appropriate level of resolution.

Integrate effect/ exposure	Integrates effects or exposure over time and space.[29]
Validity/accuracy	Parameter is true measure of some environmental condition within constraints of farm operations and purpose of program. Related or linked unambiguously to an endpoint in an assessment process.
Reproducible	Reproducible within defined and acceptable limits for data collection over time and space. [30]
Representative	Changes in parameter indicate trends in other parameters they are selected to represent.[31]
Scope/applicability	Responds to changes on spatial and temporal scales appropriate to evaluate grower practices and efforts to improve water quality.[32]
Reference value	The TAC would develop various benchmarks against which to measure progress.
Data comparability	Can be compared to existing data sets/past conditions.[33]
Anticipatory	Provides a warning of changes. In particular, practice evaluation has the capacity to demonstrate how cultural practices can degrade or mitigate impairment issues in real time, which would improve the capacity to interpret CMP site and

[29] Evaluation of on-farm practices tends to generate highly variable results. Although this criterion is appropriate for CMP sites, few on-farm measures would generate data that meet this criterion, i.e. Integrates effects or exposure over time and space. As the TAC develops the Quality Assurance/Quality Control Plan, the value of this criterion will need to be constrained to improve the efficiency the practice evaluation program.

[30] Reproducibility is tough when cultural practices remain dynamic. In my experience, the closer one is to the source of NPS the higher the coefficient of variation and the less reproducible the data because the sources of variation have their highest influence.

[31] The TAC would define assumptions that define representativeness of parameters. For example, soluble reactive phosphorous measured in the lab often represents ortho-phosphorous as a parameter. Although this is a well-established assumption, being explicit about such assumptions improves program transparency and understanding.

[32] In contrasts to CMP sites, evaluation locations may change because of cultural practices, which are fluid. In particular, there may be lags between the establishment of practices and water quality improvements. The development of water quality criteria that adequately account for lag times would be addressed by the TAC. Unfortunately, few resources are available to address these issues – from a regulatory or scientific perspective. As in many environmental issues, a policy that appreciates lag times is difficult to justify and enforce, e.g. climate change. The TAC would be selected to anticipate this policy and science interface and it is outside the scope of this report to wrestle with these questions.

[33] Data comparability would be limited in the audit system. On-farm audits would be developed to be comparable between farms within a year, but would be designed to address the dynamic nature of farming and sources of pollution. However, practice effectiveness evaluation methods would remain consistent so that practices can be evaluated on different farms, times and scales.

	groundwater well data over the long-term.
	Practical considerations
Cost/cost effective	Information is available or can be obtained with reasonable cost/effort. High information return per cost[34].
Level of difficulty	Ability to obtain expertise or appropriate training to monitor. Ability to find, identify, and interpret chemical parameters. Easily detected. Generally accepted methods available. Sampling produces minimal impact on farm management and operation.
	Water quality programmatic considerations
Relevance	Relevant to desired goal of the Agricultural Discharge Waiver.
Program coverage	Program uses suite of indicators that encompass potential sources of impairments identified by the CMP sites.
Understandable	Indicator can be transformed into a format that growers, Board Staff, and the public can understand.

Proposed Water Quality Criteria

The Central Coast Regional Water Quality Control Board lists 23 Beneficial Uses. For the purposes of the proposed model, these beneficial uses have been distilled (simplified) into three criteria that cover a range of water quality parameters, which include water for farming, water for aquatic life, and drinking water protection. Each of these has different numeric and narrative objectives and requires a range of protective actions by growers, thus providing a robust measure of the Agricultural Alternative Proposal.[35] The criteria would be used to assess risk and evaluate practice effectiveness. The TAC would develop and recommend to the 3PG governing board operational water quality indicators designed to meet the specific criteria.

Criterion #1: Protect High Quality Irrigation Water for Crop Production

Irrigated agriculture depends on an adequate water supply of usable quality. In general, water quality concerns have often been neglected because good quality water supplies have been readily available. Although the water quality in the region varies, growers implement a wide range of cultural and agronomic practices to farm successfully. However, the supply of adequate quality water is declining in several basins in the region due to intensive use of high quality water supplies and no regional planning to ensure water sources are used for appropriate beneficial uses.

[34] Cost estimates have been outlined in Appendix B. However, these costs would depend on the development of the QA/QC requirements by the TAC and how the water quality criteria would be used in the evaluation process.

[35] The three criteria are proposed as a minimum number of criteria. The 3PG(s) may embrace other criteria as needed to demonstrate the goals to meet Basin Plan Objectives.

The three water quality issues associated with water used for irrigation include salinity, toxicity and excessive nutrients. The CMP has focused on surface water sampling and analysis for toxicity and nutrients. To establish a baseline of water quality prior to agricultural use, groundwater and surface water quality could be evaluated relative to the guidelines established by the FAO[36] and outlined in Table 2. The risk assessment and the practice evaluation program would rely on these criteria to protect water quality and promote the appropriate use of water for agricultural purposes.

Table 2 – Laboratory Determinations Needed to Evaluate Irrigation Water

Water Parameter	Symbol	Unit	Usual Range for Irrigation Water
Salinity			
Electrical Conductivity	EC	dS/m	0 - 3
Total Dissolved Solids	TDS	mg/l	0 - 2000
Cations and Anions			
Calcium	Ca++	me/l	0 - 20
Magnesium	Mg++	me/l	0 - 5
Sodium	Na+	me/l	0 - 40
Carbonate	CO3	me/l	0 - .1
Bicarbonate	HCO3	me/l	0 - 10
Chloride	Cl	me/l	0 – 30
Sulfate	SO4	me/l	0 - 20
Nutrients			
Nitrate-Nitrogen	NO3-N	mg/l	0 – 10
Ammonium-Nitrogen	NH4-N	mg/l	0 – 5
Phosphate-Phosphorus	PO4-P	mg/l	0 – 2
Potassium	K+	mg/l	0 – 2
Miscellaneous			
Boron	B	mg/l	0 – 2
Acid/Basicity	pH	1-14	6.0 – 8.5
Sodium Absorption Ratio	SAR	me/l	0 - 15

Criterion #2: Protect Aquatic Life in Receiving Waters

Guidelines for establishing water quality necessary to protect aquatic life are based on measurements of discharge, temperature, in situ water quality parameters, turbidity, chemical constituents, toxicity, and overall condition of habitat and species of concern. With existing methodologies, water quality criteria may be derived from single-species toxicity data by statistical extrapolation procedures (for adequate data sets) or by use of empirically-based assessment factors (for data sets of any size).

[36] http://FAO.org. In addition, there are water quality numeric objectives in the Basin Plan and will be harmonized with Board Staff.

The endpoints for protecting aquatic life[37] would be evaluated by the TAC and adopted by the 3PG governing board. For the purposes of planning, however, it should be noted this program would focus on potential causes of impairment identified at the CMP sites. Thus, evaluating practice effectiveness using water quality constituents such as pesticides and sediments may be the focal points of analysis to protect aquatic habitat. The program would evaluate practices to reduce concentrations and loads of appropriate sources of impairment based on the constituents identified by the CMP.

The 3PG has the capacity to refine and adjust the aquatic habitat objectives based on the diverse conditions within the region. For example, water quality criteria in waters along the Big Sur coast may not be same as the creeks in the more arid climate of the San Benito County. This level of sophistication follows the goals of the Clean Water Act and Porter-Cologne Act.

Below is a summary of the objectives that could be used to evaluate this program

Basin Plan Water Quality Objectives			
Parameter	Surface Water	Irrigation Water	Aquatic Life Protection
Ammonium-N	< 0.025 mg/L	30 mg/L (total Ammonia: NH4 and NH3)	***
Chlorophyll a	< 40 µg/L*	***	***
Conductivity	< 3,000 µS	< 3,000 µS	***
Nitrate-N	< 2.25 mg/L	***	***
Nitrate + Nitrate	< 10.0 mg/L*	30 mg/L	***
Ortho-Phosphate-P	0.12 mg/L	***	***
Oxygen, Dissolved	General DO ≥ 5.0 mg/L	***	≥ 7.0 mg/L – Cold water habitat ≥ 5.0 mg/L – Warm water habitat
pH	6.5 > 8.3	6.5 > 8.3	7.0 > 8.5 – Cold and warm water habitat
Phosphorus-P	0.37 mg/L	***	***

[37] The development of the endpoints may follow endpoints established by other public resource agencies (e.g. Fish and Game, State Water Board, US Fish and Wildlife). The 3PG may select appropriate endpoints to ensure high quality data and comparability.

Total Dissolved Solids	10 - 250 mg/L **	***	***
Turbidity	< 25 NTU*	***	***
Water Temperature	8.9 > 22.7 Celsius	***	Shall not increase 15°C above natural receiving water temperature

* Indicates guideline not described in the Basin Plan or not specifically stated as applicable to surface water.
** The objective depends upon the water body. The recommended drinking water standard is < 500 mg/L.
*** Not specifically noted in the Basin Plan water quality objectives for that beneficial use.

Criterion #3: Protect Ground Water Drinking Water Supplies

According to the Basin Plan, "wastes discharged to ground waters shall be free of toxic substances in excess of accepted drinking water standards; taste, odor, or color producing substances; and nitrogenous compounds in quantities which could result in a ground water nitrate concentration above 45mg/l (10 ppm)." Estimates of nitrogen loading to the ground water by current agricultural practices are difficult to calculate and require expensive monitoring. Nevertheless, to protect ground water resources growers would evaluate the nitrate leaching potential of current practices to limit impairments of the state's precious ground water supplies. Understanding the fate of nitrate as it moves through the vadose zone will be a key component for growers to meet this criterion. Thus, evaluations would characterize the role and effectiveness of various practices to reduce the nitrate load potential in the context of in situ degradation with this established criterion. The ecological and cultural drivers of leaching are highly variable across the landscape and at this time growers have few reliable tools to assist in reducing leaching potentials. Developing the methods to determine leaching is beyond the scope of this report, but several consultants and UC Cooperative Extension Specialists have offered their expertise create standardized and robust methods. Without a doubt, developing a simple, low-cost leaching evaluation method should be a high priority in the region and may be part of the PEEP.

Appendix C. Patterns and Process of Water Quality Impairments: Scale and Implications

Water quality impairments are highly variable and unevenly distributed across the landscape. Potential sources of water quality impairment vary dramatically between different land use types and associated technological developments through time. Growers with the same intensively grown row crops might have very different impairment issues based on the unique nature of their farms or specific practices. Assessing water quality risks for contemporary land uses can be difficult when data are sparse. Below is a summary of some of the major water quality impairments associated with agriculture. A refined summary of these impairments would provide the 3PG the basis for the on-farm risk analyses within the Farm Plan and Audit Program.

Surface Water Irrigation Runoff

Sediment and Turbidity

Sediment and turbidity have numerous impacts on aquatic health. In our Mediterranean Climate, maintaining soil cover is challenging. Without cover, soils can erode and sediments can be carried into surface waters. Soils under various cultivation practices can be unstable and susceptible to erosion. In addition, steep slopes, soil type, and specific factors influence the potential risk of soil erosion, some of which might end up in receiving waters. However, land-use, climate change and flood control projects can also alter discharge regimes and can subsequently disturb geomorphology stability and generate in-channel sources of sediments. These complicating factors limit the capacity of the CMP sites to demonstrate the success of the existing Agricultural Waiver Program. On the other hand, the Agricultural Alternative Proposal has the capacity to evaluate and address on-farm sources of sediments and turbidity at the farm scale even if CMP sites fail to meet beneficial uses for these constituents.

Nitrogen and Phosphorous

Plant growth and crop yields can be severely limited by macro and micronutrients. Two of the most common soil additives, nitrogen (N) and phosphorous (P), can move into and contaminate surface waters. Elevated nitrogen (as nitrate) and phosphorous can stimulate algal growth and create eutrophic conditions. In the mixed-use watersheds of the many CMP sites, nutrient loads often include a range of sources such as urban runoff, septic systems, atmospheric deposition, as well as agricultural sources.

In agricultural production, the timing of nutrient inputs can have dramatic economic implications. Thus, growers decide when and how much N and P to add at various stages of crop development. In the last decade, the decision processes to manage soil fertility for growers has become more complicated and requires greater sophistication to remain economically sustainable. This is in part because of rising fertilizer costs and various consumer concerns, such as food safety. Developing a robust mechanism to reduce the loss of nutrients to the environment requires adequate understanding of these decision making-processes. By developing the capacity to evaluate practices at the farm scale, practice effectiveness evaluation can demonstrate water quality improvement signals that are not apparent at CMP sites because of the diversity of sources.

Pesticides and Pesticide Toxicity

Water column and sediment toxicity has been a key concern to address. In general, the combined effects of legacy and currently used pesticides may be important causes of toxicity in samples from the CMP sites. Because the relative role of currently applied compounds remains ambiguous, this proposed model would provide direct evidence regarding on-farm practice effectiveness in measures of pesticide concentrations or toxicity changes because of various practices via the Practice Effectiveness Evaluation Program. Measuring and optimizing practice effectiveness would address water quality objectives to improve aquatic habitat in Central Coast streams by focusing on currently applied materials and on-farm practices (such as sediment control) to align policy with grower capacity to make improvements. The capacity to demonstrate water quality improvement at the farm scale would provide better detail to the Board regarding the success of management practices because the effectiveness evaluations are linked to on-farm risks.

Ground Water

Ground water is an important resource for the state as a whole and this region in particular. Ground water is a source of drinking water and irrigation water and maintaining high quality water supplies is a key agenda of all water users. Well-drilling technology and expertise has increased dramatically in the last few decades with improvements in well logs, construction, and wellhead protection. These practices have reduced direct contamination of ground water sources. In addition, the application rates, timing, and coordination with irrigation have dramatically reduced the amount of nitrogen available to leach into the ground water.

Farmers in the region appreciate the need to continue efforts to limit ground water contamination. However, the source of nitrate contamination remains ambiguous from farm-to-farm. It is unclear to what extent current practices contribute to ground water contamination. Thus, this program specifically evaluates current practices' risk to ground water contamination. Ground water protection regarding nitrates is being coordinated by the RWQCB via a locally-driven Salt/Nutrient Management Plan stemming from the SWRCB's 2008 Recycled Water Policy and funding from Proposition 84[38]; project funding to reduce and prevent contamination of ground water directed by SBX2.1[39] in September 2008, which allocates $50.4 million to CDPH to protect drinking water and to develop pilot projects in the Tulare Lake Basin and the Salinas Valley to address nitrate contamination, both also funded by Prop 84; SWRCB's Groundwater Ambient Monitoring and Assessment (GAMA)[40] program; international award-winning special studies by the Lawrence Livermore National Laboratory's Nitrate Work Group; the California Nitrogen Assessment[41] currently being conducted by UC Davis; and DWR mandates such as Integrated Regional Water Management (IRWMP) and bond funding to provide clean drinking water

[38] http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2009/rs2009_0011.pdf

[39] http://www.swrcb.ca.gov/publications_forms/publications/legislative/summaries/legsum0708.pdf

[40] http://www.waterboards.ca.gov/water_issues/programs/gama/

[41] http://nitrogen.ucdavis.edu/research/nitrogen

infrastructure. In this context, activities to protect ground water are extensive. Nevertheless, the risks associated with legacy and potential ground water contamination issues require a broader regional approach that incorporates these statewide endeavors.

Well-screening intervals

Screen wells that cross multiple water-bearing zones have the potential to transport contaminated water from one aquifer to another. Indentifying these wells is a key prerequisite before improvements can be made, but this knowledge in isolation cannot be used to evaluate the contamination potential of the wells. A regional understanding of head potentials, aquifer connectivity/isolation/extent should also be considered to provide context for the risk assessment. In contrast to Staff Recommendations, this program would put wells in this context to evaluate their role in ground water contamination and identify appropriate practices to address these risks.

Well and well head construction

The risk of contamination to ground waters via poorly protected wells and wellheads, as well as practices associated with these well operations is a key concern for Farmers for Water Quality. Without detailed information, Staff recommendations may direct resources to address low-risk issues. Effective practices to prevent ground water contamination should reflect actual risks based on the specifics of each well and each grower's practices.

Nitrate Leaching

Nitrate leaching is difficult to estimate but remains a key risk to address. Using a combination of practices, the 3PG would address leaching based on farm and practices that increase the risk of nitrate leaching. However, the success of these practices is fundamentally linked to the economic viability of farming with respect to salt management in the soils,[42] which are also linked to subsurface drainage issues in some sub-watersheds. To address the leaching issues, the Practice Effectiveness Evaluation Program will work hard to develop a needs assessment to determine the key aspects of nitrate leaching that growers have control of and how they might be able to improve their practices relative to limit nitrate leaching. Over the course of the first year, the 3PG would develop nitrate leaching risk assessments as part of the Farm Assessment and Action Plan and develop practice effectiveness evaluation projects to develop new test strategies to reduce leaching.

Subsurface drainage (i.e. tile drains) have been documented as sources of nitrate in the region. Except for some recent attempts to mitigate these sources few resources have been made available to growers to reduce nitrate leaching. This is in part because the removal methods are expensive, requiring substantial land dedication or investment in technology.

[42] Salt management is one of the most difficult aspects of farming in arid climates that rely on irrigation water. In contrast to many growing regions around the world, California growers remain some of the most effective growers to maintain crop production in spite of the threat of salt build up in soils.

Tile drains are often used in areas with a perched water table and heavy soils and poor drainage. Tile drainage is a common practice in the lower reaches of many coastal watersheds but this is not universal, for example, some areas in the upper part of the Pajaro River Watershed have tile drains, They act to lower the water table so the roots of the plant remain above the water table and capable of respiration. Fields typically have been opened up and pieces of tile are laid in the soil at varying depths to facilitate the drainage of subsurface water to the actual drain. These improvements have been made at considerable cost. These fields have limited agricultural value should discharges from tile drains be eliminated.

Some drains may benefit many coastal estuaries as a significant water source, which may provide habitat for aquatic species during the summer months. In addition, the presence of tile drains may limit nitrate leaching to ground water, but this potential benefit has not been investigated in the region.

Unlike irrigation surface runoff that can be reduced through improved irrigation techniques, tile drain discharges are difficult to control because of they drain a water table that may be regional in extent and not associated with individual farming operations. In addition, the strategy to reduce nitrate levels is by treatment has not be adequately tested for its efficiency and evaluated for its cost effectiveness.. Therefore, discharges from these drains must be distinguished from tailwater or storm water discharges and will require the development of different strategies.

Storm Water Runoff

The control of storm runoff can be very difficult for a myriad of reasons. In spite of the difficulty to control it, the 3PG may include aspects of storm water control in practice evaluations of farms because growers and the public have expended significant resources to limit storm water runoff impacts on receiving waters. However, it should be noted that publically funded projects to protect life and property from flooding might contribute to current water quality issues associated with storm runoff. In addition, storm water runoff often depends on up-stream land uses, which growers have no control. Thus, separating grower contributions and upstream contributions may need to be addressed by the 3PG to appropriately address storm runoff water quality concerns.

Sediment and Turbidity

Storm water sediments and turbidity have an important effect on aquatic species (e.g. steelhead salmon). Developing and maintaining practices to limit sediment and turbidity in surface waters remains a challenge on many farms, especially those on a slope. Growers have invested significant resources to limit storm water runoff conveyance to surface waters. Many of these practices have been effective, but the application of these practices may not be appropriate to all farms. Therefore, this plan would identify the relative risk to water quality from sediment transport to identify effective practices.

Nitrogen and Phosphorous

While storm runoff depends on unpredictable events, farm practices have traditionally been based on agronomic or market demands. These can lead to an exponential effect of combined risks (e.g. recently applied fertilizers and late spring rains that transport nutrients off-site). Measuring the

effectiveness of practices to reduce this risk, while maintaining crop yield and quality, would provide direct evidence of the capacity for farmers to anticipate and control the effects of unpredictable events and reduce rain-event transport of nutrients into surface waters.

Pesticides toxicity

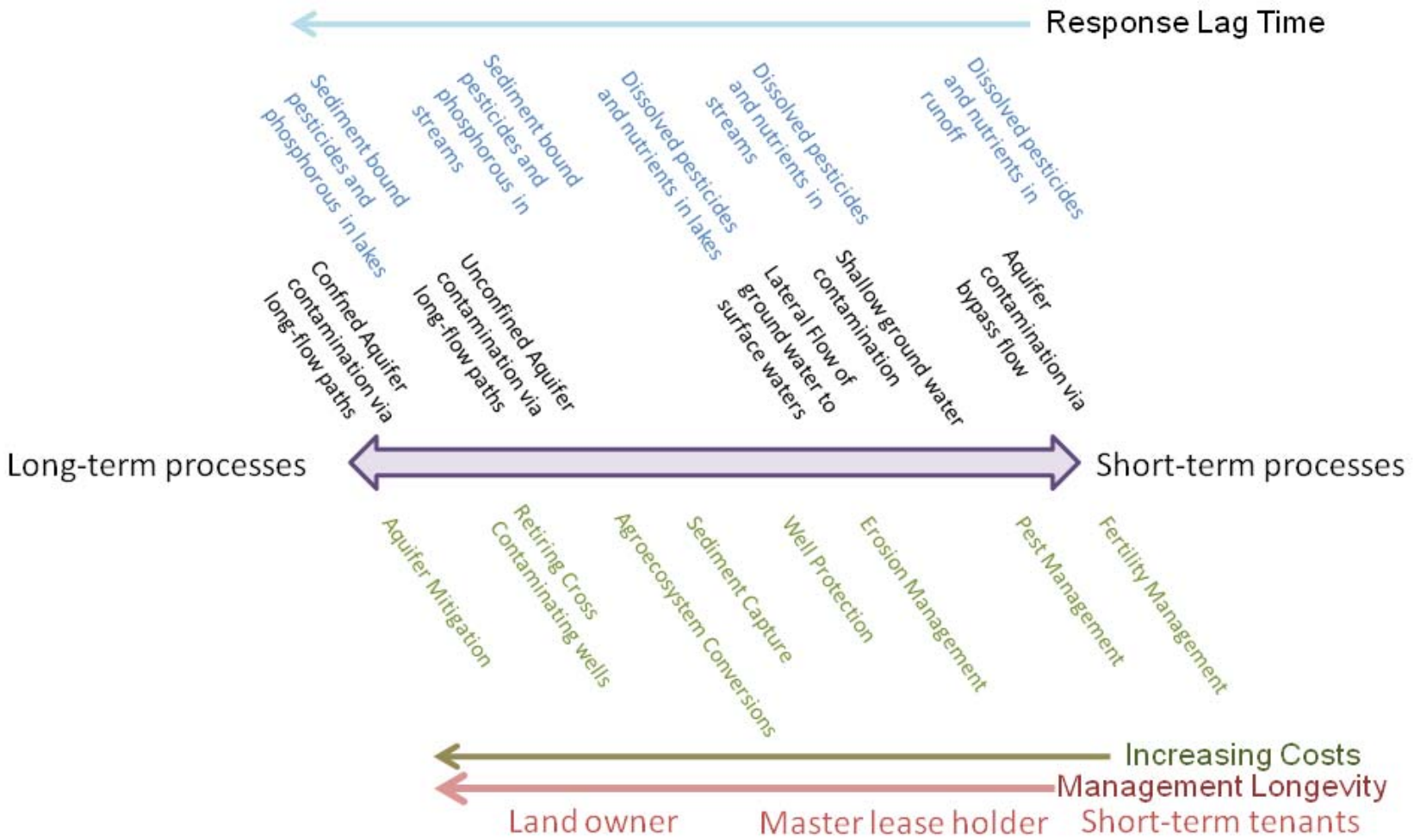
The transport of pesticides off-site is a fundamental concern. Many growers capture their runoff to prevent contamination of surface waters with residual pesticides. Currently, few technologies are available to address this issue. By measuring and reporting the effectiveness of various farm practices to reduce off-site losses of pesticide residues, growers can implement and evaluate various practices.

Time and Process Scale Implications

The scale of water quality impairments do not map well on farm management scale (See Figure below as an example of how these scales might be misaligned. Note: This figure was developed to illustrate the mismatch and should not be used to characterize any particular farm, which would certainly vary from this image.) Growers may have short or longer-term lease on land and the capacity and involvement of land-owners may sort out in differing locations along the time axis. Developing a farm plan that can address the range of processes and time scales is a challenge and would require careful consideration of impairments and farming practices and various stakeholders (growers, land owner, etc) might be identified with different responsibilities might a valuable step in the development of the Farm Assessment and Action Plan.[43]

[43] Some have suggested a section of the Farm Assessment and Action Plan be developed for landowners. The growers where highly divided about how useful this might be and requires further development.

Time Scale Process of Impairment and Implementation of BMPs



Appendix D. Components of a Auditable Farm Water Quality Plan

The Farm Water Quality Plan Scale

The Farm Water Quality Plan (Farm Plan) would be used for three purposes: 1) To assess risk, 2) to document best management practice implementation, and 3) provide the basis of an independent audit. Although conceptually, it is easy to think of one-to-one correspondence between a Farm Plan and a farm, this may not be necessary. For example, the Farm Plan may include more than one farm if the risks and BMPs installed are managed for the entire set of farms. For the purposes of this Proposed Model, we assume each farm has a unique Farm Plan. In addition, the Farm Assessment and Action Plan may stay with the farm (e.g. sold to the next leaseholder[44]) when the property management changes hands.

Two year history… data appropriate for water quality..

Self-Assessment of Water Quality Impairment Risk

As the basis of the Farm Plan, the Self-Assessment of water quality risk is the foundation for the program. Growers (or consultants) would assess each farm for surface and ground water impairment risks. It should be noted, however, that growers interviewed for this proposal or those interviewed by Kay Mercer (pers. comm. Aug, 1, 2011), was quick to point out that there was an "Achilles heel" for each of their farms, which meant that there was a water quality problem or, more commonly, some unknown about a certain risk (e.g. leaching potential or captured storm water quality). This suggests that the risk assessment should be based on what is known about discharges. If unknowns exist, specific actions should be required to develop a robust assessment.

The capacity of growers, consultants, and auditors to assess risk will vary thus require an evaluation instrument that is both flexible and unambiguous. Comments by growers and auditors regarding the development of this evaluation tool suggest that the details of a risk assessment instrument will require careful consideration of the complex management practices and diverse farm characteristics. Developing the risk assessment structure would require significant effort by the TAC.

Evaluation of Water Quality Risks

For each water quality criterion, the risks of water impairments from each farm or group of farms[45] would be evaluated using several approaches. Each approach would be used to evaluate potential contributions to impairments, at different scales and goals.

1. Farm Water Quality Assessment and Action Plan (Farm Plan). Using the Farm Plan, growers or qualified consultants[46] would assess potential risk of impairing surface receiving water and

[44] Growers believe this would be a very unlikely outcome.

[45] Growers may develop small groups of grower cooperators that can develop coordinated Farm Plans to address a water quality impairment issues as a group.

groundwater for each farm or group of farms. The assessment would rely on grower practices as well as characteristics of the farm or farms (See Appendix C for a discussion for the development of a risk self-assessment). Characteristics of the farm may include soil types, slope, well-water depth and water quality, etc. Should multiple 3PGs develop the Farm Plan can be tailored to specific grower needs and water quality concerns. However, diverse Farm Plan templates would be challenging to evaluate by auditors and it could be difficult for the Water Board to determine the effectiveness of the Agricultural Proposal. If multiple 3PGs develop, a standardized Farm Plan would require greater investment up front, but might be more efficient and effective as the program is implemented.

In addition, growers may prefer to work within a watershed group or coordinated approach. Under this scenario, a Farm Plan might be developed for several growers simultaneously. This has the advantage of 1) being more efficient with resources and 2) developing a coordinated effort to implement, audit and evaluate practices on scales that can be assessed in a valid way.

Dischargers who are participating in a 3PG would identify the water quality risks of their operation based on each of the following four categories:

- Toxicity and Sediment in Storm water;
- Toxicity in Irrigation Runoff;
- Nutrients in Irrigation Runoff;
- Nitrate Leaching to Groundwater.

A general risk assessment would be conducted at each farm to help growers align practices with the water quality risks. Appropriate responses include “Yes”, “No”, “Not Applicable”, and “Unknown”. These can be easily answered by growers for each farm. The TAC would develop this assessment to create unambiguous, auditable results. The development of this of this survey would require time and testing of the instrument to increase the value of the survey. The TAC would also develop a review and reporting procedure and create a numerical "weight" for each item, detailing how an overall score is calculated and how management practices may be applied to each risk. In addition, the TAC may act as a resource to dischargers by 1) providing advice regarding BMP development and implementation, 2) identify practices that require further testing before they can be reliably applied. In particular, when

[46] The capacity of qualified consultants in the region is limited. Nevertheless, if the demand were steady, several educational institutions would be in the position to develop appropriate training programs. However, it might be more appropriate to consider specific aspects of the farm management separately to seek expertise. This document attempts to link "knowledge" of the farm-level sources of impairment to the risk assessment, which might require some investment. Thus, those costs are included in the development of a farm plan by the grower. Nevertheless, without creating excess "overhead" associated, as growers implement various practices and are the position to determine practices effectiveness as part of their farm plan, the TAC would be in the position in a year to develop cost effective on farm practices and methods to evaluate them as recommendations. A more efficient model might be to encourage growers to ask their crop advisors or fertilizer companies to provide evidence that their fertility practices do not pollute. Growers can use that data in a risk assessment. Service providers might take the opportunity to develop a metric to provide evidence of fertility efficiency.

"unknown" is a grower response, the TAC may recommend that the growers conduct follow-up assessments or that the 3PG(s) provide resources to growers to assess their risks, with more information. Alternatively, "unknown" responses suggest that the farm may be a relatively high-risk due to the uncertainty. 3PG(s) would need to address these questions and make policy decisions early in the development of the program.

The following provides a basic outline to how the risk assessment might be structured. However, it should be re-iterated that an adequate risk assessment would require careful attention to detail and revision beyond the scope of this document.

Potential Farm Plan Risk Assessment Survey

Criterion 1:3 Does surface water leaving the farm meet the irrigation water quality objective?

1a. Do cultural practices prevent storm runoff from meeting irrigation water quality objectives in terms of toxicity and sediment?
1b. Do cultural practices prevent irrigation runoff from meeting irrigation water quality objectives in terms of toxicity?
1c. Do cultural practices prevent irrigation runoff from meeting irrigation water quality objectives in terms of nutrients?
1d.Does the well or other water source associated with the farm meet irrigation water quality objectives?

Criterion 2: Do you have evidence that soil water below the root zone would not contaminate the ground water? [47]

2a. Does soil water below the root zone meet irrigation water quality objectives in terms of nitrate concentration?
2b. Do all ground water active wells associated with the farm possess functional backflow prevention devices?
2c. Can you verify that active ground water wells associated with the farm do not cause cross-aquifer contamination?
2d. Do practices ensure that surface stored on the farm (e.g. sediment basins, storm water capture basins) and meet water quality objectives prior reaching ground water supplies?
3e. What is the Hazard Index for the farm based on the UC Riverside Hazard Index? [48]

Criterion 3: Do you have evidence that the surface runoff would not adversely affect aquatic life?

[47] Defining groundwater remains a central concern. It is unclear how the Regional Board reasonably expects to regulate unsaturated vadose zone water or soil water below the root zone. Precise definitions of these waters may be better thought of as operational definitions (e.g. if water can be pumped from a formation (aquifer) then this may be a more appropriate regulatory definition of groundwater).

[48] Hazard Index using the HI calculator located at http://wrc.ucanr.org/search2.php?page=2

3a. Do practices ensure that surface runoff pesticide concentrations are below the threshold to protect aquatic life?
3b. Are practices which are designed to limit sediment from discharging to surface waters installed to protect aquatic life?
3c. Are there sources of impairment outside the boundaries of the farm (e.g. a residential development upstream of farm) that may significantly contribute to the decline of aquatic habitat?

Water Quality Protection Matrix

The TAC might develop a matrix to summarize the water quality risks and steps taken to protect water quality. The matrix links the Farm Water Quality Plan (FWQP) to the audit process and can be used to report risks and associated practices to minimize the risk. The Water Quality Protection matrix would be developed if the 3PG Alternative were approved by the Water Board. A unique matrix might need to be developed for each commodity.[49]

The Water Quality Matrix could be developed for specific types of commodities. For example, strawberries, raspberries, cool- and warm-season vegetables may have different risks and practices associated to reduce those risks. In addition, inter-annual weather, seasonal, and regional sources of variation would need to be incorporated. To develop these types of products, the TAC may create subcommittees representing different commodity groups to develop appropriate tools. Should numerous 3PGs develop, it may be useful to develop a consistent matrix format to help auditors generate consistent and reliable results.

Practice Evaluation Checklist

The practice evaluation checklist could be developed as part of the Farm Plan, Audit process and Practice Effectiveness Evaluation Program. This might provide a simple and easy way to track practices to improve water quality by growers. One fundamental question to be addressed is whether the checklist is static (and can be used to track changes over time) or whether to allow the checklist to be dynamic (incorporating new information to protect water quality). The 3PG(s) would need to decide which of these approaches are more appropriate using water quality criteria.

The TAC would assign values to each practice and develop a ranking system for variation in practice effectiveness. After the audit process and practice evaluation, these may be adjusted based on new information.

The practice evaluation would need to be developed to assess each of the risk categories and linked to the water quality criteria above. However, the development of the checklist would also need to incorporate the diverse practices and land tenancy arrangements in the region. It would be useful to have a consistent checklist across the region. This may be too difficult to develop, but easier to evaluate.

[49] In fact, by allowing each commodity group to develop their own matrix, grower participating and buy-in might increase.

For example, if multiple 3PGs develop their own checklist used by farmers with multiple crop rotations in different 3PGs, then the checklists might be ambiguously applied.

Appendix E. The Audit Process

The Agricultural Proposal proposed an alternative to the Staff Recommendation for the Agricultural Discharge Waiver. As a central part of the Agricultural Alternative Proposal, a 3PG[50] would oversee the development of an independent audit procedure to demonstrate good faith effort by growers to improve water quality. As articulated in this document, the audit process would be an annual process where 20 percent of the growers would be audited each year, although growers should be able to elect to be audited before they are selected. The selection process would be based on a random process. Growers who do not pass the audit process (which includes a number of steps) would be removed from the list of "Good Standing" participants, based on the proposed rigid criteria outlined below.[51] Although criteria will be developed by the 3PG, independent personnel will conduct the actual audit. This independence is key to maintain program legitimacy.

Preparing for the Audit: Developing the Farm Water Quality Assessment and Action Plan (FWQP)

The Farm Water Quality Assessment and Action Plan (Farm Plan) would be the cornerstone of the audit process. The Technical Advisory Committee would develop the Farm Plan components, where each portion would be explicitly auditable. The Farm Plan would be developed by the TAC, based on the existing farm plan templates, e.g. those already developed by the University of California and Central Coast Water Quality Coalition. The substantive changes to the Farm Plan would improve the identification of risk and practices that can be fairly and reliably audited. In addition, the Farm Plan and associated documents for the audit would be web-based so growers can update the Farm Plan without having to reenter the entire document.[52] It should be noted the risk will be assessed by the grower and by the independent auditor to ensure consistent standards are used across the region.

[50] If multiple 3PGs develop, then a consortium of 3PGs may work together to develop and oversee the audit programs to limit audit program diversity and potential for conflicts or confusion. This would be especially important when farms are rotated between very different crops, such as leafy greens and strawberries.

[51] The standards to remain in "Good Standing" have not been vetted with growers and would be a policy decision adopted by the 3PG. The criteria listed here should be seen as a starting point.

[52] The philosophical value and practical use of the Farm Plan remains controversial. The Practice Effectiveness Evaluation Plan characterizes the Farm Plan as a planning document that explicitly requires implementation and verification. The implementation is verified by the audit process. Thus, the Farm Plan is an agreement between the 3PG and the growers. In addition, the Evaluation Plan does not consider the Farm Plan to be water quality compliance document for public inspection. In this context the Farm Plan is a business plan and deserves to be respected as such. It should remain the property of the grower who shares it with the 3PG and auditors for verification purposes. That this document can serve water protection goals through the audit process is a key strategy for grower participation. Nevertheless, the Board may decide that some additional documentation, separate from the Farm Plan, is needed for compliance.

Selection of Growers to be Audited

Each year a minimum of 20 percent of the participating growers would be randomly selected to be audited.[53] In addition, growers may opt to be audited before their random selection in order to accelerate program effectiveness without incurring substantial costs. The first year of auditing should begin six months after the Farm Plan is distributed so that growers will have clear audit process guidelines.[54]

Alternative selection criteria highlight the diversity of potential approaches. For example, commodity groups could be selected in series so that an auditor would be able to specialize on certain crops for a period of time (e.g. strawberries in 2013, Cole Crops in 2014, leafy greens in 2015, etc.). However, because of land tenancy and crop types moving between farms, this might prove to be too complicated.

Defining Participation for Each Audit

Originally, Farmers for Water Quality proposed that each grower would have a farm audited.[55] However, to increase the robustness of the program, this document proposes that each farm be audited. Practice effectiveness measures would be done on a subset of farms, representing 10 percent of the farms audited.[56]

Components of the Audit

We propose an audit composed of the following three components:

[53] The capacity to audit 20 percent of the growers versus 20 percent of the enrolled acreage may be substantially different. For the purposes of this document, the selection has been limited to 20 percent of the participants (i.e. enrolled growers and all their farms). However, the 3PG may decide to use 20 percent of the enrolled irrigated acres for budget and planning reasons.

[54] If the Board approves of the Alternative Proposal to the Agricultural Discharge Waiver in September 2011, the Farmers for Water Quality expect to have the FWQP template developed by the spring 2012 and the region would have its first audits by the fall 2012.

[55] We identified several weaknesses with this approach. In particular, if only one farm is audited, who would determine which one? Given the range of potential sources and the assumptions that few farms may significantly contribute to water quality impairments, and then the selection of one farm could miss important sources of pollution. In addition, because of land tenancy, growers might not be the appropriate stakeholder to audit. Addressing this issue is beyond the scope of this work but would need to be addressed by the 3PG.

[56] It remains unclear if there is capacity to audit this many farms in the region if participation is high and the audit process is complex. Capacity building may require a year of "ramping up", which is a decision that the TAC and 3PG would need to address.

1. Delineation of each farm and sub-watershed locations. Prior to on-site evaluations, background research for each farm would include documenting the history[57] of crops, pesticide use, potential contamination issues of regional aquifer locations, and potential receiving water impairments.

2. Water Quality Risk Assessment. An agricultural water quality expert would make a site visit to each farm and develop a risk assessment that identifies potential sources of water quality impairments and determines whether growers properly assessed risk to the surface and ground water. We propose that scores be disaggregated to distinguish differing types of risk (e.g. surface versus ground water contamination). The independent auditor would evaluate risk based on a combination of on-farm practices and farm characteristics to establish an "external" and "objective" risk evaluation. The audit would evaluate the accuracy of the Farm Plan and would rely on:

    a. Photo-monitoring
    b. Soil fertility management records
    c. Pesticide application and use reports
    d. Groundwater well testing records and tile drainage pumping records[58]
    e. Physical evidence of runoff
    f. Physical evidence of practice implementation[59]

2. Water Quality Practices Audit. Several audit models are possible. We propose that a team of auditors would carry out each audit. The audit team members would be selected to represent risk issues appropriately and their knowledge of practices designed to mitigate the potential impairment causes.[60] The team (or well trained individual) may need expertise in pest control,

[57] Without creating a irrelevant historical documentation, growers suggested that maintaining two years of ranch records was reasonable.

[58] There are some questions about the feasibility of metering tile drains. Frankly, this might restrict participation, which might reduce the overall effectiveness of the program. However, knowledge about tile drain pump rates is a good way to assess water impairment potentials, even if the rates are estimates with high levels of uncertainly. The TAC and 3PG will have to further develop this idea to determine if this is reasonable, feasible, and useful.

[59] Practice implementation may include on-farm measures practice effectiveness. For example, the presence of a back-flow preventer can easily be documented. However, confirmation that the back-flow preventer is working may require additional on-farm measures to document effective ground water protection. How these measures would be evaluated would be determined by the TAC and 3PG governing body.

[60] Growers are suspicious of untrained or unqualified auditors. Therefore, we proposed a team of trained auditors although this would increase the prices and time required for an audit. That said, some would argue that an audit that requires too much time and expertise would be inefficient and detract from its value. Thus, It might be better to spend a little more to hire qualified personnel with broad based expertise or an independent audit company who can absorb costs for maintaining broad expertise.

fertility management, irrigation practice evaluations, agronomy, agricultural water quality, salt and drainage issues, etc. The team (or individual) would evaluate grower practice with respect to the risk analysis. The audit would determine 1) whether water quality impairment risks were properly identified and 2) if practices identified in the Farm Plan are used and appropriate to address the risks identified in the Water Quality Risk Assessment stage.

3. Audit Score Implications[61]. The development of passing scores would be made as a recommendation by the TAC and approved by the 3PG. Passing scores may require minimum performance with several types of water quality risks (e.g. ground water and surface water scores). If the farm does not meet a minimum standard for protecting water quality (for each score type a follow up audit would be scheduled at the growers' expense to re-assess grower activity, improve farm capacity and reduce risk of water quality impairments. Growers must have their farm re-audited within three months with a passing score.[62] As an alternative model, disaggregated audit scores (i.e. particular water quality concerns) could be used to identify management practices required with certain timeframes as defined by the 3PG. At the end of each year, every farm that was audited would be ranked based on the team's audit process and risk assessment. The 10 percent of the farms that have the highest potential to cause impairment of receiving waters (surface or ground water) would be evaluated for practice effectiveness for a two-year period as a mechanism to improve water quality.

4. Practice Effectiveness Evaluation Program. At the end of each audit cycle the farms ranked with the highest risk and/or least effective practices would undergo an intensive practice effectiveness evaluation for two years (or appropriate crop cycle) to reduce potential risks of water quality impairments. The number of growers to be evaluated would depend on available resources (costs and personnel), but this Plan proposes to address the top 10 percent of the high-risk farms for a two year period each year. The Practice Effectiveness Evaluations would be paid for by the 3PG. Similar to each component of the audit, alternative models exist. To keep program costs down the 3PG may focus on specific impairment issues each year (e.g. sediment (2013), nitrate leaching (2014), surface water toxicity (2015), etc). On the other hand, the 3PG could provide resources to commodity groups to address commodity specific issues (e.g. irrigation efficiency for peppers, nutrient management in artichokes, or sediment control in vineyards). This approach might provide capacity to work with extension specialists who have long-planning horizons and public-supported research agendas.

[61] One commentator asked, "How will you control for situations in which a grower with low risk but high actual impact passes because their audit score was good but they were, in reality, impacting water quality?" If this is the case, then the audit tool is a failure and needs to be re-developed.

[62] Three months might be too aggressive a timetable. Much would depend on the details of the audit. For example, if the Farm Plan is out-of-date because of changes in a lease agreement, it could take the grower time (e.g. a full year) to align the Farm Plan with the water quality risks and practices. It might be appropriate for auditors to recommend a reasonable timeframe to have the farm re-audited with some guidelines established to guide the re-audit process.

Defining Participation in Good Standing

Growers who are in good standing in the Third Party Option would be exempt from other Staff Report recommendations, based on the assumption that the audit program would provide a direct link between water quality risks and implemented practices to improve water quality. "Good Standing" could be defined as the following:

- Growers who participate would be expected to keep and make available to auditors appropriate records.[63] These could include farm maps, crop history, fertilizer applications, irrigation schedules, pesticide applications, ground water well logs, and any surface or ground water quality testing completed.
- Work with auditor to assess risk for each farm and seek out expertise to address risks identified by the auditors with 3PG or other private or public resources.
- If a farm fails an audit, the grower can have a re-audit done within three months of receiving the results of the first audit.
- Willingness to have high-risk farms be part of a two-year intensive practice evaluation program and implement improved management practices (at the grower and/or landowner's expense) to reduce risk of impairing water quality objectives. The evaluation would be paid for by the 3PG and would support evaluation and practice effectiveness tests.

Several approaches to the development of criteria for "Good Standing". The proposed criteria above could provide a model, however the 3PG(s) may adapt their definition of "Good Standing" to meet the water quality goals they would be addressing within the constraints of the 3PG structure.

Thresholds to Drop Growers from "Good Standing" Rolls[64]

Growers who fail to participate would be dropped from the rolls of "Good Standing" and be reported to the Regional Board for further action. We propose that all farms managed by the grower be dropped from the program, not a single farm. However, if impairment is cited at a single or handful of farms exists that cannot be addressed appropriately; a grower can dispose of (no longer farm) the farms from their management after the first audit and remain in the program.[65]

[63] These records may make up a portion of the FWQP, which would be associated with the farm or group of farms.

[64] In general, this section requires additional detail. For example, one question that needs to be address is does the audit change with farm scale? This type of question will need to be addressed by the 3PG and TAC.

[65] Alternatively, the 3PG(s) may opt to track farms instead of growers that are in "Good Standing". Although such a model might be more complex to manage, it could allow growers the flexibility to use a combination of the Staff Recommendation approach (i.e. tier assessment, risk and management) and the 3PG alternative if the Order is written in such a way. We see few advantages to such an approach, but it could be considered by the 3PG(s) and Regional Board as an alternative.

Reasons that may result in loss of "Good Standing" status include:

- Failure to submit a Notice of Intent (NOI) to the Regional Board and notifying the commitment to participate in the 3PG.
- Failure to pay the fees associated with the CMP and 3PG.
- Failure to develop a Farm Plan for each farm. This is non-negotiable because the entire audit process is based on this stage.
- Failure to provide auditors access to farms, required background information, and evaluate water quality risks.
- Failure to pass a second audit. [66]
- Failure to implement management practices to address water quality issues identified by auditors and an audit score that remains below the threshold after a follow up audit to be determined by the 3PG governing body. For example, if only a subset Farm Plan practices are completed by the second audit, then the grower would be dropped from the program.
- Unwillingness to address issues on a high-risk farm as part of the Practice Effectiveness Evaluation Program.

Unresolved Issues

Growers may participate in the program and develop a range of cutting-edge technologies and practices to improve water quality but still fail to meet or reduce impairment risks. This outcome should not reflect on the growers as non-participatory. However, without making significant progress toward meeting water quality objectives, the status of these growers (or farms managed by these growers) remains ambiguous at this stage. 3PG(s) would need to address this conundrum and evaluate how to proceed. Since the goal is to improve water quality, it may be advantageous to consider a second round of practice effectiveness evaluation (two additional years) at the grower's expense. The grower may decide that moving out of the 3PG alternative would be advantageous and instead ask to be placed in the Staff-recommended tier system.

How does the 3PG respond if a new tenant farms on a farm that has failed a previous audit? In these circumstances, the 3PG may opt to develop policies to engage the landowner directly to ensure the farm passes audits. By assigning the failed audit to the landowner, it would allow the new tenant the

[66] Developing criteria for audit failures would be require some policy decisions by the 3PG and outside the scope of this document. However, as defined in this document the failure of passing an audit and being categorized as a high-risk farm are separate categories. In other words, a farm can pass an audit and be ranked as a high-risk farm that would be evaluated for practice effectiveness. While another farm may be ranked as a low-risk but can fail an audit (and second audit) and removed from the "Good Standing" participant list. The details of these criteria will be determined by the 3PG governing body.

capacity to farm without a failed audit to address directly. Another option is allow the new tenant to have an audit done based on their practices but paid for by the previous tenant. How the audit process incorporates the diverse land tenancy would require some careful considerations by the 3PG(s). The nature of the relationships between growers, leaseholders, and landowners is extremely complex. Addressing these complexities will require some additional effort that was beyond the scope of this report. In general, some guidance from the TAC and the Regional Board might be useful before further addressing this issue.[67]

In addition, the selection of the top 10 percent of the farms for water quality risks needs to be further refined based upon the goals of the 3PG. Questions about diversity of farm operations and growers may provide other important criteria to stratify the populations and obtain a more representative group of growers. Using water quality protection as the primary concern, the 3PG would need to develop a transparent and justifiable system of selecting the high-risk farms.

Audit Evaluation and Training

The development of the audit system would be carried out by the TAC. Members of the TAC may ask for outside comments by Board Staff, environmental stakeholders and community members who are have experience in audit programs. These comments would be used to provide well-defined criteria to ensure transparency, technical legitimacy and garner stakeholder "buy-in" to the program.

The audit program would be evaluated in year three and year five (prior to the expiration of the Agricultural Discharge Waiver) to determine its effectiveness. The criteria for evaluating the effectiveness would be developed by the TAC in consultation with the Board Staff and community members. Using this document, measures such as reliability, repeatability, and representativeness would be key areas used to evaluate the audit program.

As part of the program development, auditors would be trained and certified by the TAC.[68] Each auditor would be evaluated each year to maintain the certification. The certification process would include a written exam and in-field performance using the measures of reliability, repeatability, and representativeness. Cross-validation between auditors and trainers would be used to measure these indicators of the audit program.

[67] Addressing the issues associated the land tenancy highlight some of the process issues in developing this proposal. Without some encouragement from the Board, investing time to sorting out these complexities has taken a lower priority for me. However, it might be easy to point to these unresolved questions as a weakness of the proposed program. I strongly disagree. If this proposed model is given a tacit approval, a range of actions can be accomplished quickly, e.g. developing the 3PG governing body, hiring staff, selecting TAC and PAC members, and resolving issues identified in this report.

[68] There may be some limitations to this approach and the 3PG would have to negotiate how to obtain qualified auditors who are certified by qualified certifiers. One approach is to develop courses with local community colleges or four-year colleges and universities. The 3PG may opt to fund the development of these courses, which might reduce the overall costs with an adequately trained workforce.

As the Practice Effectiveness Evaluation results are analyzed by the TAC, the Farm Plan and Audit Program may be changed to better address water quality issues. For example, if water quality criteria are not effectively protected with current practices and other practices are demonstrated to be more effective, the TAC would recommend changes to the Farm Plan and Audit Program to improve water quality.

Audit Result Challenges

Growers can challenge audit results 1) if their farm(s) is (are) categorized in the high-risk farm(s) or 2) did not pass their audit. As part of the challenge, the grower has the following rights:

1. The farm or farms that are categorized in the high-risk can only be re-audited after the first year of the Project Effectiveness Evaluation. By requiring the farm to go through this process, it would allow the audit results to be informed by water quality criteria. These audits would inform the TAC about the sensitivity of the initial audit to water quality criteria. In addition, since the option relies on growers cooperating with the program, if each grower challenges the audit to get out of the high-risk category, then the program would spend more time defending the audit program than addressing water quality.

2. Growers can only challenge re-audit. This is meant to discourage continual challenges in the first round of audits.

3. The 3PG governing body would arbitrate if audits are challenged.

4. The challenge would have no bearing on whether the grower is in “Good Standing”.

5. The most recent audit score would be used for each reporting cycle.

Appendix F. Practice Effectiveness Evaluation Program

High-risk farms would have their practices evaluated by a team hired by the 3PG.[69] Based on the types of water quality risks identified in the audit process, the practice effectiveness evaluations may be tailored differently each year (e.g. focus could be impairment issues, commodity types, sub-watersheds, technology breakthroughs, etc). The main component of the Evaluation Program is its capacity to address water quality risks based on an independent audit and allow the growers to address water quality concerns related to protecting the economic stability of the operation. The Evaluation Program proposed here is similar to publically supported projects to improve water quality, such as EPA 319h grants or UC Cooperative Extension activities. These programs encourage peer-reviewed activities that maintain scientific integrity, which will server growers well. However, as a technical service, these programs are cumbersome to manage, and recent evidence suggest that NGOs developed to support the previous Discharge Waiver have a risk of cost increases that discourage participation. Because the selection and development of the appropriate business model is beyond the scope of this report, we can only recommend that the 3PG(s) would need to balance these concerns when they develop this program.

Practice Evaluation Criteria

Practice Evaluation Criteria would be directly linked to risks to water quality criteria. Practices designed to improve water quality are often limited in their capacity to the context of their development (e.g. geography, crop types, cultural practices, etc). In addition, because of the natural variation of biotic and abiotic drivers in ecosystems, practice effectiveness can vary on both spatial and temporal scales. To address these uncertainties the TAC would develop methods to determine how practice effectiveness measures can include likelihood of impairment and mitigation combined with percent mitigation. The development of these metrics would require considerable investment by the TAC.

Practice Effectiveness Evaluation Process

The TAC would develop an announcement for funding to assess specific sources of impairment based on the audit ranking process. Once a team or teams of evaluators has been selected, they would begin a two year process to evaluate existing or to promote or test new practices to address water quality risks at each farm. After five years, six percent[70] of the highest risk farms[71] would have their practices evaluated for effectiveness and improvement.[72]

[69] The hiring process would be decided by the 3PG. However, a public request for proposals from consultants, public and private researchers or other expert may be appropriate to promote transparency.

[70] This is based on the assumption that 20 percent of the participants would be evaluated each year and 10 percent of the farms are re-evaluated. If the same number of farms are evaluated each year then 2percentpercent of the farms are evaluated each year (20 percent x 10 percent = 2 percent/year). After five years of the program, there would have been four years of evaluations initiated and three years of evaluations completed (3 x 2 percent = 6 percent). It is important to note that growers are constantly evaluating practices on their farms, often with private/public funding arrangements. These activities would continue. This program adds a specific and unique

The evaluation process would include collaboration with the growers to identify risks and appropriate practices to minimize the risk and measure their effectiveness. Over a two-year period, the practice evaluator team(s) would use fertilizer, irrigation, and pesticide application records, on-farm monitoring to evaluate load reductions for existing practices and test new practices aimed to improve water quality. The evaluation process would use the three water quality criteria identified in this document to evaluate the practices to simplify the results and data analysis. The evaluation of grower practices would be carried out for two years on each farm (or group of farms) identified as high-risk. [73] Members of the TAC, independent researchers, and consultants may be hired by the 3PG to evaluate farm practices and their effectiveness relative to water quality objectives. The results of this program would report pollutant load reductions to be used to evaluate the success of practices and evidence of overall program effectiveness to identify high-risk operations and improve water quality.

On-farm practices would be evaluated using a range of methods including:

a. Photo-monitoring
b. Irrigation Efficiency Tests
c. Surface Water Quality Testing
d. Vadose Zone Soil Testing
e. Trend changes in CMP sites
f. Cooperative treatment systems[74]

---

component to address the high-risk farms. However, these percentages are suggestions and can be changed if 3PG can be more or less aggressive and the relative detail (and associated costs) wanted for each farm assessment. The ultimate criterion for the 3PG policy decision is "what is the best way to meet water quality objectives?"

[71] It is conceivable that a sub-watershed be addressed as a whole because risk is well distributed with a finite set of participating growers. Similar to work done in various creeks in the region, focused work to address a watershed in a holistic way is very compelling. However, demonstrating practice effectiveness requires very high participation (perhaps greater than 80 percent) and management practices that have exceptional capacity of success. Few opportunities exist with these opportunities. However, the 3PG(s) could be organized along watershed boundaries and this might prove to be the most effective model to address water quality impairments.

[72] Some are concerned that the number of ranches evaluated per year might be too low or even not meaningful. The low number of farms to be evaluated was selected because there is a high degree of effort anticipated for each evaluation. Because the highest priority ranches are selected, we believe an intensive effort will be required. We recognize that the number may be seen as too small for the Regional Board. However, if the program can show substantial improvement on these ranches and the results are incorporated into the Farm Assessment and Action Plans, I believe dramatic water quality improvements will be seen.

[74] The Regional Board has identified the value of created wetlands and vegetative treatment systems to reduce pollutant loads and the utility of the watershed approach in meeting water quality objectives in a variety of documents. The Staff recommendations do not indicate how such practices can be incorporated into the wavier nor do they credit landowners who adopt these measures (e.g. reduced management or reporting requirements). Specifically, landowners that agree to cooperatively propose and implement a watershed-based approach that

Finally, after completing the evaluations estimated load reductions, which would be reported in aggregate to the Board, would be used to promote or demote practices based on their effectiveness. In addition, the evaluator team would work with the TAC after completing their work to revise components of the Farm Plan and audit process to reflect the most successful practices to protect water quality.

includes slope stabilization, in-channel vegetation, appropriately placed and designed treatment systems to improve runoff water quality should have an incentive to do so under this irrigated lands waiver. Without mechanisms to compensate farmers for integration of off-farm practices, such as adding a treatment system to their management strategy, there is no incentive to choose such actions, as they represent an additional voluntary cost rather than the selection from a set of management measures most appropriate for the site specific land use and water quality needs. This proposal encourages adaptive management and efficient use of resources, farmers that work collaboratively to create an integrated approach to meat water quality objectives. A collaborative approach could reduce costs to individual farmers, improve water quality and habitat and create better monitoring data through standardization and collaboration with local experts, thus integrating the values of the watershed approach into the regulatory process.

Appendix G. Documentation and Reporting

The Agricultural Proposal outlines a robust reporting plan that would 1) report the names of growers in good standing in the third party group and provide aggregate data (i.e. data are not linked to the farm or individual growers), 2) provide the Regional Board with evidence that growers are effectively implementing management practices designed to reduce nonpoint source pollution from irrigated lands (e.g. load reduction estimates), and 3) engage in cooperative evaluation of the effectiveness of these management practices in regard to improving regional water quality related to crop production, drinking water and aquatic life in receiving waters. The reporting plan would explicitly include third-party certifications to ensure high quality data that include measures of reliability, repeatability, and representativeness measures.

Each grower and farm would be given a code so data stored by the 3PG would protect the identity and farm locations of the participants. Summary reports provided to the Board and public at-large would include the data reported in aggregate. However, growers may be given the option to release data from their farms. We propose that reported data would include practice effectiveness measures such as the reduction of ground water nitrate loading or surface water runoff sources of impairment. We propose the following reports would be made available to the Board on an annual basis:

1. Risk Self-Assessment Summary (First Report within twelve months of Board's Approval). Growers would submit a risk assessment evaluation for each farm.[75] The data would be summarized in a report to the Board to document the number of farms and types of risk captured by the 3PG Program. Depending on details yet to be worked out by the 3PG, reporting may include a summary of the number of farms and types of risk to the three water quality criteria above. Report summary format would be submitted for Executive Officer three months after Board's Approval.[76]
2. Farm Water Quality Plan Summaries[77] (First Report within eighteen months of Board's Approval). Each grower would submit their completed Farm Plan as an on-line document to the

[75] The 3PG will define and develop reporting requirements. As goal, these Farm Assessment and Action Plans would be more easily auditable if they were electronic, on-line forms. This will be an important decision to be made by the 3PG governing body.

[76] A number of questions arise with the suggestion of Board approval that would need to be addressed. These questions are beyond the scope of this document, but would need to be negotiated in clear unambiguous terms if the 3PG alternative is accepted. For example, when an asymmetry in reporting requirements and deadlines exists, it can frustrate the process and stakeholders. The process for dealing with these types of issues must be clear.

[77] Submitting reports to the Regional Board remains an area needing negotiation. The value of Farm Plans for growers to address water quality may be substantially diminished by developing a reportable format for the Board. Based on the Staff comments on July 6, 2011, more explicit reporting was needed to evaluate the Agricultural Proposal. However, generating reports that fail to accomplish that goal do not serve the regulated or regulators well. In this case, a report summarizing Farm Plan may have no value. Finding common ground on this issue may require some thoughtful discussions with the Board.

3PG nine months after the Board's approval of the Agricultural Proposal. The Farm Plans would be summarized in a matrix format that links risk with practices used to protect water quality. This report provides the verification that Farm Plans have been created and that practices to protect water quality have been documented. Report summary format would be submitted for Executive Officer six months after Board's Approval.[78]

3. Summary of Independent Auditors' Reports (First report within twenty-four months of Board's Approval). The first independent audit of growers would be completed by twelve months of the Board's approval of the Agricultural Proposal. The 3PG would summarize the results of the audit each year for each round of audits. The data in this report would report the following information:
    a. Number of growers and farms participating in the audit
    b. Number of growers and farms who fail the audit.
    c. Corrective action taken for growers who fail the audit and subsequently pass.
    d. List of grower names who are in "Good Standing"
    e. List of grower names who are not in "Good Standing" and would need to participate in the Board Staff compliance approach.

    Report summary format would be submitted for Executive Officer twenty months after Board's Approval.

4. Practice Effectiveness Evaluation Summaries (First Report within forty months of Board's Approval). Grower practices to reduce risk of water quality impairments would be evaluated based on the three criteria in this document. Evidence for load reduction for effective practices would be documented using DQOs defined in this document operated by TAC recommendations, and adopted by the 3PG governing board. Report summary format would be submitted to the Executive Officer thirty months after the Board's Approval.

[78] This timetable is aggressive and reflects the interest by some growers to demonstrate the efforts they are putting into water quality protection. The interest is not universal, which is expected.

Appendix H: Technical Advisory Committee

The Technical Advisory Committee would develop the Farm Water Quality Protection Plan template used by each participating grower. The TAC would be appointed by the Board of Directors. The plans would be developed with clear objectives to improve water quality and criteria for an unbiased third party audit. The bulk of the TAC's work would be performed within the first six months if the 3PG concept is approved by the Board. Based on the comments by Board Staff and discussions between various regional groups and growers, we have outlined the following required skills and abilities for the TAC and a work plan timeline.

Technical Advisory Committee Skills and Abilities

Scientific understanding of water quality and its intersection with production agriculture is surprisingly limited in the region and state as a whole. Few of these experts have the capacity to dedicate the time needed to develop the resources needed to develop a successful program. Therefore, the TAC would be made up of a number of subcommittees coordinated by staff with a high level of cross-disciplinary background.[79] The subcommittees would focus on narrow aspects of the FWQP, risk assessment, and audit process that potentially include personnel with the following affiliations or skills:

- UC Cooperative Extension
- Resource Conservation District
- Agronomists
- Soil Scientists
- Crop and Pest Control Advisors
- Expertise of Food Safety
- Regional Expertise
- Salt mitigation and management
- Tile drainage management alternatives
- Hydrogeology and well construction and maintenance
- Informational Technology

Timeline of Activities

The activities of the TAC would follow the overall timeline and milestones of the Agricultural Proposal, but are broken out to be more explicit for the TAC.

Task	Milestone	Timeline
Develop Database and Web Portal	Secure on-line database	Twelve months after Board approval
Revise Farm Plan Assessment Criteria	Secure on-Line Risk Assessment	Twelve months after Board approval

[79] Even with flexibility developed within the text here, the number of qualified and available personnel in the region is probably not going to meet the demand. Much would depend on capacity of the 3PG to raise funds and the flexibility of the Board to entertain some flexibility in meeting milestones proposed here.

Develop on-line tracking system	TAC staff capacity to track grower participation	Eighteen months after Board approval
Develop Farm Plan Practice Documentation Criteria	Secure on-Line Practice Documentation Criteria Submit Report Template for Board Approval	Twelve months after Board approval Fifteen months after Board approval
Develop Audit Program	Beta Audit Program Final Audit Program	Eighteen months after Board approval Twenty four months after Board approval
Develop Practice Evaluation RFP and hire consultants	Funding Announcement Analysis of Results Submit Report to Board	Thirty-six months after Board approval Thirty-six months and annual afterwards after Board approval Annually after thirty six months

Appendix I: Public Advisory Committee

The public advisory committee would provide public input and feedback to 3PG program(s). The PAC would be appointed by the Board of Directors. The public advisory committee would provide external stakeholder input and advise the 3PG governing body. The membership could be modeled along similar lines as the water board membership, composed of public leaders selected by the 3PG governing board for their knowledge, vision, public policy experience, and diversity of professional expertise.

The PAC should be comprised of at least an agricultural business leader, non-agricultural business leader, environmental interest leader, affected county representative, affected city representative, and a representative of a state resource agency.

The PAC would meet once a year to learn about the program activities, farm plan summaries and results of the audit and practice evaluation and effectiveness program. The PAC would provide publically available written comments on various aspects of the program and recommendations that might improve program efficiency in the 3PG efforts to improve water quality.

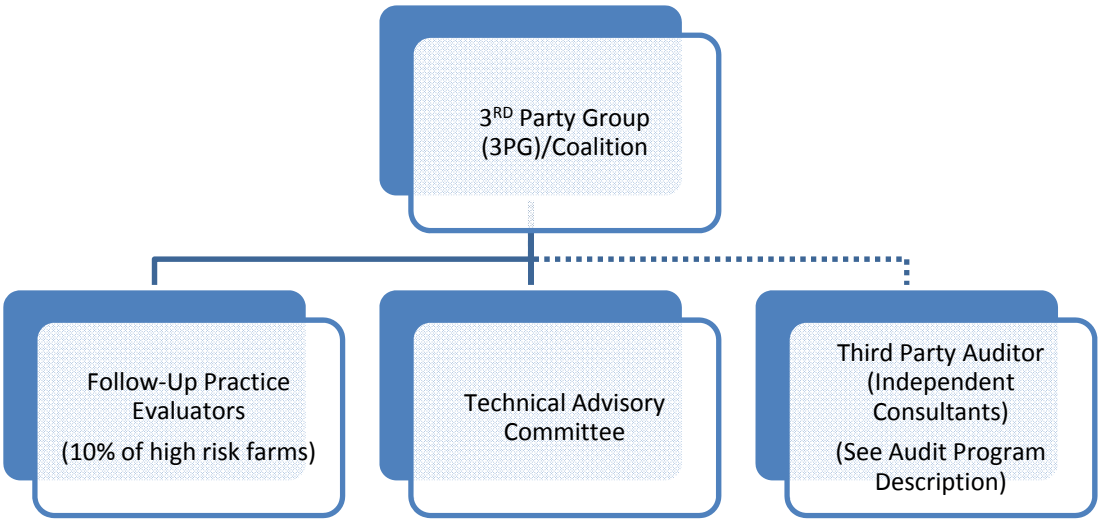
Appendix J. Steps to Develop a Quality Assurance Program Plan

The TAC would develop a Quality Assurance Program Plan (QAPP) based on the acceptance of the Agricultural Alternative proposed by the Farmers for Water Quality. We propose that the TAC recommend a QA/QC Plan to ensure that data quality and integrity meets appropriate standards, which provide long-term legitimacy to the program. The steps are outlined below with some proposed language to be further developed by the 3PG(s).

1. Defining the reason for practice evaluation. The program would document the effectiveness of cultural and best management practices to improve surface water quality and reduce the leaching potential to the ground water. In addition, the program would identify practice limitations with respect to meeting water quality criteria to highlight research needs.

2. Establish goals. The goals of the program are to evaluate and promote practices to improve surface and ground water quality.

3. Detail organizational structure. The development of the TAC and the audit program require clear roles and oversight. The details of this structure would be developed by the 3PG, but below is a structure proposal. 3PG Board(s) would be composed of farmers that are participants in the program and would focus on cost allocation, program goals and mission statements. They would hire a program director to manage the program. The TAC would be managed by another 3PG employee to coordinate the development of the Farm Plan, Audit Program, and Evaluation Program. The TAC would be composed of personnel with a range of skills and background as outlined in Appendix A. The TAC would develop and maintain the Practice Evaluation Program and the contracting of the evaluators, who may be consultants, public or private researchers.



4. Task List Associated With Practice Evaluation. The final task list for practice evaluation would be developed by the 3PG. However, we have identified the following tasks as potential action items for each year of the program:

    1. Develop and distribute the Farm Plan and Audit Program to participating growers.

    2. Determine annual budget.

    3. Develop a system to enroll growers into the 3PG.

    4. Create a mechanism to select 20 percent of the participants in "Good Standing" to be evaluated, which also allows volunteers willing to be part of the early-evaluation program to do so.

    5. Develop auditing metrics and develop third party auditor capacity to audit each[80] farm in the region.[81]

    6. Develop a ranking system to select top 10 percent of high-risk farms for follow up evaluations.

5. Data Quality Objectives. Implement a robust audit Quality Assurance and Quality Control procedure (to be created by the TAC) to ensure DQOs are being met.

6. Training Requirements. TAC would develop clear and stringent training sessions for auditors to ensure the program is consistently applied across the region by different auditors. Based on a number of recommendations, the audit teams would have several different backgrounds. Working together as a team they would be able to assess water quality risks and associated appropriate practices to improve water quality. Growers are very concerned about poorly trained or inconsistent audit results, so the development of a strong audit program would be up to the TAC.

[80] An estimate of the number of growers and associated farms that enroll in this program is beyond the scope of this document. Therefore, the capacity to audit each farm over a five-year period is a question that needs to be further analyzed. Much would depend on the detail and effort needed for an accurate and reliable audit. In addition, once the NOI has been submitted, the 3PG would be able to evaluate the capacity to meet these goals.

[81] Issues of land tenure remain a significant complicating factor. It has been suggested that the Board develop a mechanism to shift the burden on landowners instead of the tenants. This would "internalize" the environmental burden into the stability of a fixed location and the parcel rents. As usual in environmental policy, the attractiveness of the simplicity of the solution has a number of unintended consequences. In this case, the ramifications are highly variable across the region and in most cases complicate the process dramatically. As a result, the growers may prefer to take a greater share of the burden and must find a way to coordinate between land they are renting at various times to ensure their Farm Plans are both up-to-date and practices are used. The 3PG would have to wrestle with this conundrum and develop an approach that is robust in the context of transient behavior.

7. Documentation Requirements. Documentation would be carefully scrutinized and all audits and follow up evaluations would be recorded carefully. These documents would be developed as part of a Structured Query Language database with appropriate back-up mechanisms.

8. Evaluation Process and Procedures. Develop a clear and robust set of standard operating procedures (SOPs) for auditors to maintain high-quality data. The value of the Practice Effectiveness Evaluation Plan depends on the quality of data and thus the Quality Assurance/Quality Control Plan would be used to ensure the highest quality data possible, by explicitly stipulating quality assurance and quality control. Quality Assurance (QA) is defined as a procedure or set of procedures intended to ensure that a product or service under development (before work is complete, as opposed to afterwards) meets specified requirements. Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria during implementation.

   Therefore, SOPs would be developed by the TAC for each of the practice effectiveness evaluation activities. These SOPs may include:

   - Sampling methods (infield & lab)
   - Sample handling methods (infield & lab)
   - What QA requirements would be in place
   - What QC requirements would be in place
   - Required instrumentation/equipment (including calibration & maintenance procedures)
   - Data Management Procedures (i.e. data review; validation and verification procedures; and Analysis and reporting requirements; maintaining data security.)

Data Quality Objectives (DQOs)

Defining the Data Quality Objectives (DQOs) is a *process* to develop performance and acceptance criteria (or Data Quality Objectives) that clarify the objectives of the 3PG Alternative. In this case, the Evaluation Plan provides some guidance on what qualifies as the appropriate type of data, and specifies tolerable levels of potential decision errors. The Evaluation Plan provides the DQOs to establish the quality and quantity of data needed to evaluate the effectiveness of practices used to protect water quality.[82] In addition, DQOs may vary with respect to surface and ground water to acknowledge their fundamental differences in terms of risk assessment and practice evaluation.

Defining and Justifying Parameters to be Measured

The document outlines the data quality requirements for all three phases of the program:

1. Farm Water Quality Plan. In contrast to the three-tiered system for identifying risk to water quality proposed by Board Staff, growers would identify risk relative to a broad range of potential impairments. The TAC would develop recommended indices to rank risks of

[82] The development of DQOs allows the explicit assumptions about what data quality is appropriate for farming activities, which may differ from academic or regulatory standards.

impairment to surface and ground water. The design and methods and some example questions are included in Appendix C. As risks are assessed it may be important to separate those associated with a particular farm (e.g. contaminated ground water wells, steep slopes, soil type) from risks associated with various farm operator practices (e.g. the use of plastic mulch, irrigation practices, etc). Thus, the TAC may consider the development of separate scores based on farm characteristics and cultural practices.[83] In addition, it may be useful to develop separate scores for surface and ground water quality issues.

2. Audit Process. The audit program would be used to evaluate a Farm Plan's risk assessment and the presence and effectiveness of practices to reduce risk. The audit itself would be developed with questions that lead to unambiguous and reproducible responses.

3. Practice Effectiveness Evaluation Program. For data generated in the Practice Effectiveness Evaluation Program on high-risk farms, we propose DQOs for a range of parameters appropriate for the risks identified and receiving water impairment issues. Load reductions would be estimated for each farm.[84]

Potential in-field parameters and the collection of surface water samples for the lab analysis. Some of these parameters would be used to calculate and report load reduction percentages:

Parameter	Range	Units	Detection Limits	Sensitivity	Resolution	Repeatability	Accepted Methods
Dissolved Oxygen	0-15	mg/L	0.2	0.2	0.2	15%	Field Measure
Discharge	wadeable	cfs	1	0.5	0.2	30%	Field Measure
Temperature	< 28˚	celsius	N/A	0.1	0.1	0.1	Field Measure
pH	2 – 14	N/A	N/A	0.1	0.1	15%	Field Measure
Turbidity	0 - 60	NTU	10	10	1	30%	Field Measure
Conductivity	< 3000	µS	100	10	10	10%	Field Measure

Parameters measured to evaluate practice effectiveness. Parameters would be used to report load reduction percentages in annual summary reports.

Parameter	Range	Units	Detection Limits	Sensitivity	Resolution	Repeatability	Accepted Methods
Nitrate-N	1-500	ppm	1	1	1	25%	10-107-04-1-F

[83] It might be useful to growers to know whether farms have water quality issues before they decide to rent them. The 3PG governing body might provide farm risks to grower participants as an "added-value".

[84] The TAC would need to decide whether the load reductions are based on the farm, a group of farms as a whole, or a single practice. There are good reasons for either alternative.

Nitrate + Nitrite	2-100	mg L	0.1				353.1/10-107-04-2-A
Ammonium-N	0.1-10	ppm	0.1	0.1	0.1	25%	10-107-06-5-E
Phosphorus-P	0.1 – 5.0	mg/L	0.015	.015	.015	25%	10-115-01-1-C
Ortho-Phosphate-P	0.05 – 5.0	mg/L	0.006	0.006	0.006	25%	10-511-00-1-A1
SSC							
Total Suspended Solids	30 - 40	mg/L	10	10	10	25%	EPA 160.4
Chlorophyll ug/L		Ug/L	2	2	2	25%	
Organophosphates**		ng/L	1 – 4.4			25%	HLB solid-phase extraction and gas-chromatography/mass spectrometry
Load Reduction	0-100	%	1	1	1	25%	Various methods

*Based on treatment plant effluent limits

**Source: http://ca.water.usgs.gov/toxics/AM_PesticidesWater.html

Audit parameters and the collection of surface water samples for the lab analysis. Some of these parameters would be used to calculate and report load reduction percentages:

Parameter	Range	Units	Detection Limits	Sensitivity	Resolution	Repeatability	Accepted Methods
Surface Runoff Impairment Risk—Farm Score	1-10	index	1	1	1	1	T BD
Surface Runoff Impairment Risk—Cultural Score	1-10	Index	1	1	1	1	T BD
Ground Water Impairment Risk—Farm Score	1-10	Index	1	1	1	1	T BD
Ground Water Impairment Risk—Cultural Score	1-10	index	1	1	1	1	T BD

The development of parameters associated with ground water protection would require additional effort. Using the UC Riverside Hazard Index would likely be a cornerstone parameter, but others may be considered. The TAC would develop these parameters and make recommendations to the 3PG governing board.

Appendix K: Cost Estimates for Proposed Model

These cost estimates are provided as a background for what might be required given the program goals. These include the entire 3PG Alternative except for the audit process, which would be paid for by the individual growers. Please note that program details (components of the Farm Water Quality Plan, Audit Program, etc.) provided by the TAC may influence (increase or decrease) the costs. In addition, the costs would vary with grower participation with more growers the lower cost per grower. It is important to note that the proposed model is one of many potential approaches. We hope growers or existing grower organizations may be able to use components of this document to develop a 3PG with lower costs.

		Start Up	Annual Costs	Other Grower Costs
Personnel				
Program Director	100%		$ 163,200	
TAC Coordinator	100%		$ 130,000	
IT Specialists	50%		$ 49,500	
Technical Assisstants	75%		$ 57,700	
Services				
Accounting Service			$ 16,000	
TAC Honoraiums	$5,000 each	$ 80,000		
Database Development/Maintenar		$ 30,000	$ 15,000	
Audit Service				see below
Practice Effectiveness Evaluation Program			$ 550,000	
Office Space				
North Region			$ 11,520	
South Region			$ 9,600	
Other Costs				
Office Supplies			$ 5,000	
Staff Mileage			$ 22,000	
Staff Travel			$ 8,000	
Phone			$ 2,400	
Internet			$ 2,400	
Electricity			$ 3,600	
Mailings			$ 4,000	
Report Costs			$ 15,000	
Computers			$ 12,500	
Printers			$ 1,000	
Webinars			$ 5,000	
Conference Calls			$ 12,000	
Insurance			$ 5,000	
Total		$ 110,000	$ 1,100,420	
Note: Intertox did a survey of the costs of LGMA. They estimated the costs of a Food Safety audit to $92.00/hour +travel, we estimate the each ranch audit will take 2 hours of office time, 2 hours in the field, plus driving time.				

We estimated the costs of the program based on wide participation based within a highly polarized political climate. With changes in the agricultural order or perceived lack of enforcement, the sustainability (financial solvency and policy effectiveness) of this program could erode. Therefore, to increase the chances of success of this program, coordination between growers, 3PG and the Water Board is required to promote this program.

Appendix L: Potential Revisions in Response to Staff Report dated July 6, 2011

Board Staff was asked to compare the Agricultural Proposal to the Draft Order proposed by the Staff. These comments provided by the Staff reflect some insights that have provided guidance in the development of this document and provide details to the Agricultural Proposal.

To add to the comparison that Staff developed, we have developed a similar comparison based on the Staff report, 3rd Party Alternative and this document.

	Staff Report	3rd Party Proposal	This Document
Risk Assessment			
Based on Staff Tier System	√		
Farm Water Quality Plan		√	√
Independent Audit Program		√	√
Participation Tracking			
Notice of Intent (NOI) (For each Farm)	√	√	√
"Good Standing " participant list		√	√
Technical Reports			
Individual Farm Water Quality Monitoring Data (Tier Specific)	√		
Aggregate Farm Water Quality Plan Summary (annual)		√	√
Aggregate Audit Summary (annual)		√	√
Summary Report of Practice Effectiveness Evaluation (annual)			√
Water Quality Objectives			
Assessment of irrigation water based on irrigation beneficial uses	√		√
Reduction of nitrate load in groundwater to drinking water standards	√		√
Protection of aquatic life in receiving waters	√		√
Protection of all beneficial uses	√		
Monitoring &/Or Accountability			
Groundwater monitoring	√	√	√
Storm water monitoring	√		
Ambient surface water monitoring	√	√	√
On-farm surface water monitoring	√		
Practice Effectiveness Evaluation			√
Management Practices			
General management practices based on NOI/self- assessment	√	√	√
Farm-specific management practice plan	√	√	√
QC/QA plan development	√		√
Backflow prevention device for fertigation	√	√	√

Backflow prevention device for chemigation	√	√	√
Administration			
Online tools for growers to upload and store data	√		√
Protection of business practice innovation		√	√
Develop growers' cost estimate			√
Costs			
Direct costs of the program have been estimated	√		√
Grower implementation costs are not included in estimates	√		√
Program Accountability and Evaluation			
Program Accountability is described		√	√
Program Evaluation is described			√

Staff comments below are interleaved with a response, based on this document. This response does not reflect the opinions of Farmers for Water Quality or their constituents and is solely the opinion of primary author, Marc Los Huertos.

1. Staff identified the following as limitations of the Agricultural Proposal with respect to monitoring and reporting:

> ***"Dischargers who elect to participate in third party groups or coalitions do not have to monitor or report any information that measures either: 1) the effectiveness of their individual on-farm management practices or 2) pollutant load reduction from their farms."***

To address this criticism, Practice Effectiveness Evaluation Plan suggests:

1. **Board Would Receive Timely Reports Documenting Practice Effectiveness.**

   Using a series of logical steps, growers would evaluate the water quality risks for each farm and report how various practices have been installed to reduce these risks. A report summarizing these blinded results would be submitted to the Board annually. The risk assessment and practices would be audited (20 percent of the farms/year), where practice effectiveness would be evaluated. A report summarizing the blinded results would be submitted to the Board annually. Finally, the top 10 percent of the high-risk farms would be evaluated for practice effectiveness and load reductions. The aggregated results of these evaluations would be submitted annually.

2. **Practice Efficiency Evaluation Program Would Document Load Reductions**

   As outlined in this document, the development of a Water Quality Practice Efficiency Evaluation Program links the Farm Water Quality Plan completed by growers and the Independent Audit to specific water quality objectives. As part of the 3PG, participating

growers would develop a Farm Plan, which identifies water quality impairment risks for each farm they manage. If a farm is deemed a high-risk farm, practice effectiveness would be evaluated with carefully defined standard operating procedures and well-developed QA/QC procedures using several approaches including surface water quality and vadose zone analysis. Results would be used to evaluate potential contributions to impairments at different scales and goals and to revise appropriate farm plans (FWQP) and the audit process. This provides feedback to the program based on water quality criteria.

2. Staff identified the following as limitations of the Agricultural Proposal regarding milestones and timeframes:

> ***"Dischargers who elect to participate in third party groups or coalitions do not have to meet any specified milestones or timeframes".***

To address these concerns this document offers the following milestones and timeframes are recommended:

1. Formation of 3PG(s)

The formation of one 3PG or multiple 3PGs would be initiated immediately after the Board's Approval. The complete organizational structure and legal entity status would be complete within six months of the Board's approval.

2. TAC Establishment and Work Products

The establishment of the TAC would proceed immediately following the Board's approval of the 3PG option. Within the first few weeks, the TAC would revise the current UCCE farm plan into an auditable, on-line document that would include a risk assessment about how water quality risks are being minimized, if applicable, by effective management practices. The TAC would provide the technical expertise to develop an audit program that would be carried out by independent auditors. The TAC would develop a funding mechanism to complete practice effectiveness evaluations to address sources that have the highest risk to impair water quality. The TAC would develop all reporting templates and a program evaluation plan to determine how changes can be made to improve the program.

3. Annual Farm Water Quality Plan

Each grower would submit the completed Farm Water Quality Plan to the 3PG nine months after the Board's approval of the 3PG option. A summary pertinent Farm Plan data would be submitted the Board annually.

4. 20 percent of the Participant Audit

Each year a randomized selection of 20 percent of the growers participating in a 3PG would be audited to ensure the Farm Plan has adequately assessed its risk to water quality and that appropriate water quality improvement management practices have been implemented. The Board would receive an annual summary of the audits.

5. Evaluation of 10 Percent High-Risk Farms

Each year 10 percent of the high-risk farms would be evaluated for practice effectiveness and load reduction estimates would be submitted annually to the Board.

6. Program Evaluation and Revision

Beginning in year three, the program would undergo an annual evaluation program to determine that: 1) the program is successful in addressing high-risk farms; 2) ambient waters (as evidenced from the CMP sites) have responded to grower action to improve water quality. In contrast to the Staff's recommendation, 3PGs have the capacity to improve the program before the expiration of the Board's Discharge Waiver. The development of the evaluation process would be a key aspect of the TAC as it develops the program.

7. Timeline and Milestones

I. Board approves 3PG Alternative
II. FWQP template developed by the Spring 2012
III. First audits by the Fall 2012

Every farm will be ranked based on the teams' audit process and risk assessment by the end of 2012 and every year thereafter. If the farm does not meet a minimum standard for protecting water quality, a follow up audit would be scheduled within three months.

At the end of each audit cycle the farms ranked with the highest risk and/or least effective practices would undergo an intensive practice effectiveness evaluation for a two-year period (or appropriate crop cycle). Depending upon resources, only the top 10 percent high-risk farms may undergo this evaluation.

The audit program would be evaluated in year three and year five (prior to the expiration of the Agricultural Discharge Waiver to determine its effectiveness.

After five years, six percent of the highest risk farms would have their practices evaluated for effectiveness and improved.

3. Staff identified the following as limitations of the Agricultural Proposal regarding the timing of the first reports:

> ***"Dischargers who elect to participate in third party groups or coalitions would not be audited by third party groups nor have their implementation status reported until two or more years after approval of the Order. The Draft Agricultural Order immediately requires all individual dischargers to plan and implement management practices, and to plan and measure effectiveness of practices. The Draft Agricultural Order requires the first reports on practices implemented and indicators of effectiveness and/or pollution reduction be submitted approximately 15 months after approval of the Order."***

To address this criticism, the Project Evaluation Plan proposes:

1. Report Water Quality Farm Plan Summary (Annual Report)

In contrast to the tiered system, each farm would be subject to risk analysis that would identify specific potential water quality impairment risk relative to three water quality criteria as part of the Farm Plan. In addition, the Farm Plan would document practices used to reduce the risks of impairing water quality. On an annual basis, data from the Farm Plans would be aggregated and reported to the Board. Data would be summarized in a matrix format that links risk with practices installed to address and mitigate water quality risks.

2. Report on Farm Plan Audits (Annual Report)

The Independent Audit program would provide a check on the risk by evaluating each farm's risk to impair water quality and the appropriate use of the practices aimed to address these risks within nine months of the Board's Approval. These milestones are concrete and aggressive to address water quality concerns.

3. Report on Practice Effectiveness (Annual Report)

The evaluation of grower practices would be carried out for two years on each farm identified as high-risk. Members of the TAC and independent researchers and consultants would be hired to evaluate farm practices and their effectiveness relative to water quality objectives. The results of this program would report pollutant load reductions to evaluate practices and evidence of overall program effectiveness. These results would be used to identify high-risk operations and develop water quality improvements. The first practice evaluations would be initiated within 15 months of the Board's approval.

4. Staff identified the following as limitations of the Agricultural Proposal regarding the timing of enrollment requirements, risk assessments, and progress evaluation:

> ***"Some dischargers who elect to participate in the third party groups would have to wait for several months to years before they are assessed for risk or provided assistance or evaluations of their progress. The Draft Agricultural Order enrollment requirements provide for assessments of all individual farms' risk or contributions to water quality in a matter of months, and self-assessments, and individual farm progress reports sooner and more efficiently than the Agricultural Proposal".***

To address this criticism, the Practice Effectiveness Evaluation Plan proposes:

Addressing water quality issues takes time and resources. One corollary is the Clean Air Act, first enacted in 1963; the most recent attempt to amend the act was H.R. 2454, a greenhouse gas cap-and-trade bill, passed the House of Representatives on June 26, 2009 (but subsequently died in the Senate). That is a span of 46 years and amendments will continue to be proposed. Meeting water quality objectives is a similarly evolving process with many obstacles and no fixed end point.

The expertise necessary to provide truly detailed irrigation efficiency tests, surface water quality testing, vadose zone soil testing and analyze trend changes in CMP sites in relation to each farm operation would require the services of more trained agronomists than currently exist in the state of California. Reporting requirements should conform to reasonable and attainable standards.

5. Staff identified the following as limitations of the Agricultural Proposal regarding incomplete or undeveloped components of the proposal:

> ***"Fundamental components of the Agricultural Proposal related to third party groups are currently incomplete and undeveloped. Consequently, full implementation of all actions to create functioning third party groups and audit dischargers as proposed is questionably achievable on the proposed schedule. The Agricultural Proposal puts off implementation of pollution control and submittal of the first annual compliance report for more than two years while these components are developed. Such components include 1) qualifications of a third party group, and 2) the content for the "General Report/Workplan for the third party group that identifies the audit process. The audit process is intended to insure farmers implement management practices and improve water quality, and replaces individual compliance monitoring and reporting."***

1. The Project Effectiveness Evaluation Plan defines fundamental components of the 3PG Alternative including:

a. The structure of the 3PG(s) including required personnel.
b. The steps to develop an auditable Farm Water Quality Plan.
c. Identification of sources of impairment as a basis of a risk assessment.
d. Identification of data quality objectives.
e. Selected water quality criteria to evaluate practice effectiveness.
f. A proposed audit process
g. An outline of the Practice Effectiveness Evaluation Program.
h. A proposed documentation and reporting component
i. Steps to develop a QC/QA Plan
j. The skills and abilities required by for a Technical Advisory Committee as a component of the 3PG.
k. Timeline of activities
l. Cost estimates associated with the 3PG Alternative.
m. Risk Self-Assessment Guidelines

2. To address the concern identified by Staff regarding 3PG qualifications the Practice Effectiveness Evaluation Plan requires the following qualification in the 3PG:

a. Capacity to enroll growers into the 3PG.
b. Technical expertise to address water quality issues.

c. Capacity to develop an auditable Farm Water Quality Plan, independent audit program, and Practice Evaluation Program
d. Develop on-line tools to complete Farm Plans and Audit Program.
e. Adequate funding to evaluate the effectiveness of on-farm practices to improve water quality.

3. To address the concerns identified by Staff regarding a subset of the 3PG work plan, the Practice Effectiveness Evaluation Plan provides:

a. Milestones and timelines
b. Organizational charts
c. Outlines the data quality requirements for all three phases of the program: Farm Water Quality Plan, Audit Process, and Practice Effectiveness Evaluation Program.

6. Staff identified the following as limitations of the Agricultural Proposal regarding a dual standard:

> ***"The Agricultural Proposal sets up a dual standard for those who elect to join a third party group and for those who do not."***

The Practice Effectiveness Evaluation Plan was designed provide an alternative to the Staff recommendations to provide a robust analysis of risk and flexibility to address water quality concerns. From a technical standpoint, the author believes this would be a more effective mechanism to improve water quality than the Staff recommendations but allows growers to choose how to improve water quality.

7. Staff identified the following as limitations of the Agricultural Proposal regarding compliance:

> ***"The Agricultural Proposal does not require compliance with water quality standards and is not clearly enforceable. It would limit the Board's authority and discretion to enforce water quality standards by defining compliance with the "waiver" as implementation of farm water quality practices, rather than compliance with water quality standards as required by the Water Code and the NPS Policy."***

The Project Effectiveness Evaluation Plan was not designed to address this concern. However, the Evaluation Plan does focus on water quality standards as it relates to the implementation of practices. The Evaluation Plan identified three water quality criteria as a gauge to evaluate practices, which are designed to provide a mechanism to meet Water Code and the NPS Policy. In this way, the Evaluation Plan is consistent with the first Discharge Waiver approved by the Board in its approach, although with much higher grower accountability and better focus on risk assessment and water quality criteria.

Grower Responses

After developing draft versions of this document, several presentations of the proposed structure of the program was presented to growers in the region (attached). In general, most growers were very engaged in the content and process of the proposed program, asking insightful and thoughtful questions. Some of these comments have been incorporated into the text, while others could not be because the questions were beyond the scope of this project (e.g. how can water quality protection standards be applied to crops being grown overseas?).

As part of the process, we developed a course survey to gauge the relative merits of the proposed program compared to grower commitment level and willingness to follow through (See attached). Below are the results to key questions in the survey. The points that remain areas that require further development and analysis: Program cost (some growers did not feel that $12/acre was cost effective), and issues of land tenancy generated a wide range of responses--most likely to due to the complexity of land owner-tenant arrangements, which is a re-occurring theme even in the current Conditional Waiver structure.

Proposed Model Response Form – Third-party Group Proposal (3PG)

1. Would you be willing to complete an auditable Farm Water Quality Plan?

Responses: 16 YES; 1 NO; 2 N/A

2. Would you support the creation of a summary report by 3PG of all Farm Plans to document risks and management practices?

Responses: 18 YES; 1 NO; 0 N/A

3. Would you be willing to pay for an independent audit to evaluate the accuracy of the Farm Plan?

Responses: 16 YES; 3 NO; 0 N/A

4. Do you think it is reasonable to prioritize high-risk farms and conduct a more in-depth practice evaluation on their operations? The evaluation may require that management practice advice be accepted from a pest control advisor, an agronomist, a drainage expert, etc.

Responses: 17 YES; 1 NO; 1 N/A

5. Is it reasonable for different farms to have different levels of practices, some more restrictive than others?

Responses: 15 YES; 2 NO; 2 N/A

6. If your farming operation were deemed high-risk, would you be willing to participate in a two-year intensive practice evaluation program and implement improved management practices to reduce risk of impairing water quality objectives?

Responses: 17 YES; 1 NO; 1 N/A

7. Would you be willing to pay $12/acre in additional fees to help fund the cost of water quality monitoring and management practice assessment?

Responses: 11 YES; 5 NO; 3 N/A

8. Would you be willing to maintain management practices developed for a specific farm for which you are taking over tenancy?

Responses: 13 YES; 3 NO; 3 N/A

9. Would you be willing to develop a Farm Plan for a farm that you lease?

Responses: 15 YES; 2 NO; 2 N/A

Appendix M: Ground Water Work Group Proposal

Over the last six months, Farmers for Water Quality, growers, and external stakeholders have proposed various options to address existing groundwater contamination issues. However, because it was unclear how the state process might define how the issues would be addressed, I decided to remove this section from the report. However, I do want to summarize a general theme: Growers have been very concerned about the groundwater contamination issue and would like to develop strategies to be part of a solution to ensure high quality drinking waters.