



March 17, 2017

Ms. Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814-0100

Re: Comment Letter – 2016 Bay-Delta Plan Amendment & SED

Dear Ms. Townsend:

The Almond Board of California (ABC) and the Almond Alliance of California (the Alliance) welcomes the opportunity to provide comments on the proposed Phase 1 amendments to the Bay-Delta Water Quality Control Plan (Project). The ABC is a grower-enacted Federal Marketing Order under the supervision of the USDA representing approximately 6,800 almond growers and 100 almond handlers. The Alliance is a trade association representing the interests of the California Almond industry including almond growers, hullers/shellers, and processors. Our members represent over 80% of the California Almond industry based on volume.

For the 2015-16 crop year, the farm-gate value of California Almonds was \$5.3 billion from approximately 890,000 bearing acres. Per USDA-NASS, there were 1,110,000 total acres for the 2015 growing season. Through farming, manufacturing, and associated industries, the California Almond industry creates over 104,000 jobs throughout the state with 97,000 jobs in the Central Valley, an otherwise economically depressed region.¹ As the #1 specialty crop export for the US, with over 80% of global supply, almonds also provide food security and nutrition to the world.

There are many ingredients to the California Almond industry's success. In addition to having the right soils, climate, personnel, and technology, as an industry we must also have a reliable water supply.

Similarly, fisheries require many ingredients to be successful. These include non-flow measures such as sufficient spawning gravels, access to floodplain habitat, reduced predation, good ocean conditions, proper temperature, and biologically functional surface water flows. Although described more simply as unimpaired flows, the SED's program of implementation prescribes adaptive management of these flows, targeting them in the right volumes and times to best benefit salmon and other fish.

Ideally, managers of both agriculture water supplies and fish flows make maximum use of limited water supplies. The California Almond industry, through the ABC and the Alliance, has made significant investments in research into and implementation of sustainable solutions for agricultural water supply, including efficiency, conservation, and storage. Most recently through the Accelerated Innovation

¹ Sumner, D., Matthews, W. Medellín-Azuara, J. and Bradley, A. 2014. The Economic Impacts of the California Almond Industry. UC Agricultural Issues Center.

Management (AIM) program, the ABC and the Alliance has promoted use of new water conservation technologies. California Almond farmers have decreased water use per pound by 33 percent over the last twenty years. Given increased pressure on aquifers, we are also developing cutting edge mapping and grower implementation tools to recharge groundwater storage through storm water diversion to dormant almond orchards.

Water managers and regulatory agencies have similarly invested in research to improve fishery management given limited water supplies, particularly during drought.

We recognize the challenge faced by the State Water Resource Control Board (Water Board) in developing policies that both support regional agriculture and restore healthy native fish populations. We support efforts to create a healthy balance based on sound science and best available technologies, maximizing benefits from each drop of water. Therefore, this letter addresses whether the proposed project successfully balances beneficial fishery and human uses, the explicit goal of the Water Board's process, by listing and describing our concerns with and recommendations for the project and the Substitute Environmental Document (SED) analysis. These comments and recommendations should also be used in the development of negotiated agreements. Critically, the project and any agreements should incorporate specific mitigation measures for regional agriculture resulting from any loss in surface water supply.

Negotiated Agreements

Additional time during the comment period extension may create space for negotiated agreements desired by the Brown administration² that improve the balancing process, improve agricultural and fishery water management, and address impacts in a more reliable and less confrontational fashion. Continued stakeholder discussions could also lead to development of a project and analysis that better reflects local interests, practical system engineering and management concerns, and lack of integration with related legislation and policy at all levels of government.

Negotiations with irrigation districts on behalf of agriculture and other stakeholders will be led by the California Natural Resources Agency (Resources Agency). Ongoing programs by irrigation districts already combine regulatory flow requirements with habitat improvements and other non-flow measures and are supported by high quality science.

These programs and science generated by irrigation districts to improve native fish habitat should form the basis for negotiated agreements.

At the same time, we encourage the Water Board and Resources Agency to engage with farmers and stakeholders outside districts and analyze project impacts to their water supply. Almond farmers outside irrigation districts would be negatively affected by the project due to loss of groundwater recharge from lost surface water supplies and increased groundwater pumping within irrigation districts.³ Districts that are partially dependent on surface diversions from affected tributaries should also be included in negotiations.

² Letter from Governor Jerry Brown to Chairwoman Felicia Marcus. September 19, 2016.

³ SED p.9-62

In general, Water Board processes and decisions should lead towards a coherent, integrated, and holistic view of agricultural water policy and supply statewide. This is particularly important for the almond industry, given our wide geographic distribution and diverse water supply sources. Groundwater, riparian, district supplied, and project water need to be managed through consistent policies that collectively support continued farming.

It is difficult to perform this type of planning with multiple, distinct, and potentially conflicting regulatory processes. We, therefore, encourage analysis and decisions in Phase 2 proceedings for the Sacramento River and Delta outflow, which also bear on San Joaquin River fish, to be analyzed and decided together with Phase 1. Given groundwater impacts under the proposed Bay-Delta Plan amendments, analysis of SGMA and its impacts to agriculture should be part of the SED analysis and Water Board decision-making process. Similarly, the Water Board should ensure that any actions related to unimpaired flows reflect the impact of recent federal legislation providing funding for research, protection, and restoration of both salmon in the Sacramento River and Delta Smelt. This legislation, providing benefits to native species that are also the desired beneficiaries of increased unimpaired flows, should be reconciled with any decision by the Water Board.

Summary of concerns and recommendations

To improve fish habitat and temperature, the Bay-Delta Plan amendments propose requiring a certain amount of unimpaired flow within the three major tributaries to the Lower San Joaquin River, thereby reducing the amount of surface water supply available for irrigated agriculture. Surface water restrictions will be felt by those reliant on irrigation district supplies from these watersheds and farmers reliant on groundwater supplies recharged by surface irrigation within irrigation districts. Impacts to riparian diverters along tributaries weren't described or analyzed.

In the project area, the SED estimates 115,066 acres of almonds cultivated within irrigation districts and 123,885 acres outside irrigation districts.⁴ There isn't an estimate of growers using riparian rights and river pumps. Within the project area, the SED estimates that almonds constitute over 20% of all irrigated acreage both within and outside irrigation districts. Given their extent, almond farming and production stands to be heavily impacted. The SED, however, largely dismisses the potential for impacts based on several assumptions, many of which were called into question during the hearings.

Based on our experience and research, combined with testimony and reports provided or referenced during the hearings from irrigation districts, affected counties, and our constituent almond growers, the ABC and the Alliance has identified the following concerns with the project and the SED analysis that result in inaccurately reducing estimates of impacts to agriculture, inflating fish benefits, and missing the mark on overall balancing:

1. **Project balancing.** While fishery benefits from unimpaired flows are studied in depth and quantitatively still relatively limited, impacts to agriculture are not fully analyzed and are potentially expansive, particularly for permanent crops. Balancing requires developing accurate estimates of benefits for and impacts to all beneficial uses⁵ and selection of the least damaging

⁴ SED Table G.4-3; G.3.2

⁵ SED Table 5-3

alternative necessary to achieve fishery goals, maximizing non-flow, adaptive management methods and mitigating impacts to farm water supply.⁶

2. **Stakeholder Engagement and Process.** Lack of engagement with irrigation districts and agricultural stakeholders during development of the project and analysis resulted in missing germane fish science and underestimation of water supply and agronomic impacts. Prioritizing development of negotiated agreements during the extended comment period should address this collaborative shortcoming but still may not be sufficient given complex and simultaneous state and federal policy and regulatory processes.
3. **SGMA policy conflicts.** Combined impacts of recent groundwater legislation and project implementation are considered speculative, inappropriately delaying a complete analysis, creating a major policy conflict for farmers and system operators, and limiting conjunctive management, groundwater recharge, and storage opportunities. A more supportive, holistic, and statewide approach to agricultural water policy and planning is needed, particularly given the almond industry's role as a regional engine for economic growth dependent on diverse water supplies.
4. **SWAP economic analysis.** Errors, omissions, and unsupported assumptions, including low acreage estimates and farmers' ability to transfer reduced water supplies to higher value crops such as almonds, resulted in a **significant** underestimation of economic impacts. Once released, methods drawn from local counties' economic analyses should be included to develop a more accurate representation of likely effects on agriculture from limiting surface water diversion.

Our concerns and recommendations are described in the following sections. We welcome engagement with the Water Board to address these issues and stand ready to help develop agreements that support continued farming and improved ecological conditions for aquatic species.

1. Project balancing

The Water Board's proposed amendments to the Bay-Delta Plan should effectively balance competing uses through a project that produces desired results with the least pain. Many speakers referred to the small amount of additional salmon (1,103) that the Water Board estimates would be produced by the project.⁷ Although the Water Board says this is a misuse of the SalSim number, this qualified figure still must be compared to certain and significant impacts to agriculture, local economies, and water supplies.

Unimpaired flows alone in the Lower San Joaquin River will not restore healthy fisheries. As was frequently mentioned at hearings, and as acknowledged by the SED, building healthier fisheries will require adaptive management, more functional flows, and non-flow measures. The requirement to use the full amount of unimpaired flow, regardless of demonstrated aquatic need and alternative beneficial uses, unnecessarily removes flexibility. For example, in any given water year type, there may be good reasons to increase stormwater capture through groundwater recharge in quantities above unimpaired percentages. In fact, expanding winter and spring flooding of agricultural areas more closely resembles historical floodplain conditions than solely increasing higher flows within a leveed river.

Furthermore, given the multiple stressors on fish populations in the Lower San Joaquin River, some of which are only addressed in Phase 2, Phase 1 and 2 proposed actions and estimated fish improvements

⁶ See p.18-1 and ES-21

⁷ SED p. 19-34

must be harmonized to fully balance water supply impacts to the region's agriculture relative to statewide biological benefits.

There are clear issues with balance in regards to impacts to agriculture from the combination of diminished surface water flows resulting from the Project and reductions in groundwater pumping under SGMA. These are not fully analyzed as they are considered prospective and "speculative," but it is imperative that the proposed amendments are consistent with other statewide policies such as SGMA.

There is still uncertainty and speculation surrounding how much fishery improvement will be garnered from flows alone, without additional non-flow measures. Impacts to agricultural water and groundwater seem much more certain than the benefits of increased flows alone for fish and require clear mitigation measures.

Mitigation

Many speakers highlighted the minimal proposed mitigation given the level of significant and unavoidable impacts to agriculture and other users. Specific mitigation measures should be further developed at the programmatic stage. The types of measures described by the Water Board in water efficiency improvements⁸ can be expanded with examples from current projects, such as lining canals, pressurizing irrigation delivery systems, and new recycled water supplies (e.g. South San Joaquin Irrigation District (SSJID) pressurization project, North Valley Regional Recycled Water Program).

Other sustainable solutions are being developed through the ABC and the Alliance research and the AIM program that are in line with potential mitigation measures including targeted groundwater recharge projects during almonds' dormant period.⁹ Implementation of these programs, and integrating management of diverse water supplies more generally, would become more difficult if surface water supplies are reduced. The project should, therefore, be consistent with other statewide policies such as the Sustainable Groundwater Management Act (SGMA) and increased local self-reliance by more directly encouraging increased groundwater storage.

2. Stakeholder Engagement and Process

The process left out local irrigation districts and their fish science

The lack of engagement with local irrigation districts that was described in the hearings is troubling. The Modesto Irrigation District (MID) and Turlock Irrigation District (TID) on the Tuolumne, and Merced Irrigation District on the Merced, have spent tens of millions of dollars on fish studies for FERC relicensing of their dams. Oakdale Irrigation District (OID) and SSJID have also done extensive fish studies on the Stanislaus. Per testimony from the districts, fish studies they prepared for FERC relicensing and continued operations were not included in the SED analysis. Had these studies been included, plans for functional, focused flow releases could have been more clearly proposed in the project description, rather than vaguer and potentially unnecessarily damaging unimpaired flows and adaptive management.

⁸ SED pp. 11-49, 50

⁹ SED p.9-61

As an example, testimony from researchers on the Stanislaus River has highlighted the importance of predator control.¹⁰ The benefits of large attractant flows in the fall has also been questioned.¹¹ This study and testimony further highlight the importance of incorporating locally generated science.

There is clearly a need to combine flow and non-flow measures, such as targeted habitat restoration and predator control, to achieve fishery improvements given that studies, including VAMP, have shown the limitations of a sole focus on flows for fisheries improvements.¹² The Department of Water Resources (DWR) provided testimony questioning the appropriateness of using a “flow-only” approach to protecting fish and wildlife beneficial uses.¹³ The SED states that, “flow alone cannot solve the many issues that native fish populations face in the SJR Watershed.”¹⁴ The expected benefits of flows alone, as shown in the SalSim model, are limited.

As mentioned, ongoing efforts by local irrigation districts to improve native fish habitat along the three tributaries, combining existing regulatory flow shaping and strategic releases with habitat improvements and other non-flow measures, should form the basis for negotiated agreements, or where absent be created through new initiatives with local stakeholders (e.g. Merced ID’s S.A.F.E. plan).

For the purposes of adaptive management, goals and success should be measured and expressed as an increase in actual population numbers, rather than solely flow-based habitat measurements that may or may not lead to fish production without non-flow measures.

Reservoir carryover requirements reduce water supply beyond just unimpaired flows

Every irrigation district highlighted the additional impact “carryover storage” would have on their ability to meet irrigation demand and the lack of an accurate analysis of these impacts in the SED. Carryover requirements, as determined by the STM advisory committee rather than irrigation district staff or board, could force districts to hold onto spring flows produced within the February-June time period, shifting use to the fall to maintain a minimum cold-water pool for fish temperature needs. If blocs of water go unused, districts could be required to further carry them over into next year. This loss of operational flexibility and storage has potentially big impacts on water supply. At the Modesto hearing, TID said their supply under the Project proposal would have resulted in zero allocation in 2014 and 2015. The effective size of the storage at New Don Pedro dam would be 450TAF, slightly larger than the original Don Pedro dam at 300TAF. This would result in providing a full water supply in only 5 of 26 years. Tim O’Laughlin from the San Joaquin Tributaries Authority argued at the Merced hearing this wasn’t even a legally allowed action by the Water Board.

Draining reservoirs also runs counter to California voters’ preference, as expressed through passage of Proposition 1, which included a goal of creating more water storage capacity in the state.

¹⁰ Written Testimony of Doug Demko. February 10, 2016. United States House of Representatives Subcommittee on Water, Power, and Oceans. The Costly Impacts of Predation and Conflicting Federal Statutes on Native and Endangered Fish Species.

¹¹ Environmental Factors Associated with the Upstream Migration of Fall-Run Chinook Salmon in a Regulated River. December 21, 2016. Peterson, Matthew L. Fuller, A., Demko, D. North American Journal of Fisheries Management.

¹² The Vernalis Adaptive Management Program (VAMP): Report Of The 2010 Review Panel. 2010. Delta Science Program.

¹³ DWR oral testimony on January 3, 2017.

¹⁴ SED p. 19-88 and Appendix K Program of Implementation

Use of averages hides true impacts, particularly for permanent crops

The SED and Water Board members often used average supply impacts, rather than acknowledging the impact a single year of no water supply would have on farming operations. Impacts are particularly devastating to permanent crops like almonds, and to small farmers without access to substitute supplies such as groundwater. As highlighted by former California Secretary of Food and Agriculture Bill Lyons' testimony in Modesto, the impact of a single year water supply deficit of as much as 40% in a dry or critically dry water year, much less multiple back to back years, will harm production and potentially kill trees. Research done by the ABC and the Alliance has also shown that deficit irrigation and drought stress on almond trees harms production in subsequent years.¹⁵

The SED economic analysis should therefore be clear about potential impacts of single year reductions, and include reduced production estimates in subsequent years for permanent crops.

3. SGMA policy conflicts

Delayed analysis of SGMA impacts understates project impacts and may overstate flow benefits

Many speakers spoke to how estimates of increased groundwater pumping resulting from decreased agricultural surface water supplies, as assumed in the Water Supply Effects model, will be in potential conflict with allowable and sustainable levels under SGMA. However, because effects "cannot be determined at this time with precision," due to their speculative nature,¹⁶ assumptions of groundwater substitution for agriculture result in understating actual long-term reductions in water supply.

The recent drought is used as an example of agriculture's ability to increase groundwater pumping in response to lost surface water supply. Semi-permanent restrictions because of policy changes are not analogous to temporary drought accommodation that relies on increased groundwater pumping.

The SED should therefore integrate analysis of the combined water supply and quality impacts of unimpaired flows and SGMA compliance on agriculture.

There is a significant challenge in making water policy when on the one hand SGMA encourages local self-reliance including groundwater sustainability and recharge, while on the other the project would limit surface water supplies and reduce groundwater recharge. Conjunctive use opportunities to store surface water through groundwater recharge in wet years, with withdrawal in dry years, would therefore be reduced (without mitigation).

An impact not analyzed in the SED -- should farmers increasingly rely on groundwater on a long-term basis and not just in drought years -- is that assumed increased in-stream flows could be lost to expanding regional groundwater depressions. The SED briefly discounts this possibility as "unlikely" through reference to a USGS model.¹⁷ The USGS report on this model, however, cautions against drawing just this sort of conclusion and cites the "substantial uncertainty" associated with the 2 cfs/

¹⁵ Shackel, K. 2012. Drought Survival Strategies for Established Almond Orchards on Shallow Soil. Almond Board of California Research Update.

¹⁶ SED p. 9-3

¹⁷ SED p. 9-14

mile estimate.¹⁸ The assumptions of limited groundwater-surface water interaction is also contradicted by a later section: “If a groundwater basin has a large volume of average inflow, outflow from the basin is also high because groundwater would drain to the rivers when groundwater elevations are high. Under these conditions, it is possible to pump groundwater without affecting groundwater elevations, although *river flows would likely be affected.*”¹⁹

Given the lack of analysis of groundwater-surface water interactions, the SED may overstate surface flow benefits under the project. Maintaining higher groundwater levels through conjunctive surface water use and targeted recharge will keep water in the river and reduce leakage.

The MERSTAN model from USGS or another appropriate one should be used to test groundwater-surface water impacts and interaction under different alternatives, and confirm SED estimates of surface water benefits given reduced surface water irrigation, increased groundwater pumping, and increased irrigation efficiency.

Economic Impacts to farms outside irrigation districts not analyzed

Increased groundwater pumping and reduced recharge are described as impacts to groundwater basins and therefore farms outside irrigation districts.²⁰ “Even when the net irrigation district groundwater balance is positive, a decrease in the recharge could be detrimental because it could reduce the amount of compensation for groundwater pumping that happens outside of the irrigation district lands.”²¹ These impacts are not however included and quantified as part of the economic impact analysis in Appendix G, which currently only includes impacts to farmers within (certain) irrigation districts.

Project impacts to farms outside irrigation district boundaries and to farms within irrigation districts in the plan area or otherwise affected that are not analyzed, should be included as part of the economic analysis.

Lack of specificity for impacts to Disadvantaged Communities

Impacts to rural communities reliant on groundwater due to declining quality, reduced recharge from surface water supplies, and increased pumping, are significant. Impacts would be particularly damaging in areas of Merced and San Joaquin Counties that have existing groundwater depressions and low water quality.

Sustainability includes ensuring that the drinking water supplies for disadvantaged communities throughout the state, including the Central Valley where almonds are grown, are protected. These are at risk from the Project due to the decreased drinking water quality that would result from increased reliance on groundwater by agriculture and potentially urban areas. “Although California recognizes water for domestic purposes as the most important use of water and irrigation as the next most important use (Cal. Code Regs., tit. 23, § 106), this does not necessarily mean that the water supply for

¹⁸ See pp. 65-66 in: Phillips, S.P., Rewis, D.L., and Traum, J.A. 2015. Hydrologic model of the Modesto Region, California, 1960–2004: U.S. Geological Survey Scientific Investigations Report.

¹⁹ SED p.9-47, *emphasis added*

²⁰ SED pp.9-22, 23,47

²¹ SED p.9-62

domestic uses cannot be modified. Furthermore, if other water districts that supply domestic uses are receiving water through contracts with irrigation districts, then these uses would not necessarily be protected.”²²

Impacts from increased groundwater pumping on drinking water, particularly schools and disadvantaged communities, should be further analyzed to a more detailed level and mitigated.

4. SWAP economic analysis

Simplified water transfer and supply assumptions

The Statewide Agricultural Production (SWAP) analysis minimized impacts to almonds through several simplified assumptions; primarily that water supplies could be reallocated from lower value field crops to higher value crops such as almonds.²³

Western United Dairymen gave a compelling explanation in Modesto for why the assumption that water could just be shifted to higher value crops was likely wrong, given the need for dairy crops not only to feed cows and produce milk, but also to facilitate manure management through use of waste and nitrogen. Disposal of manure in fields is often the most cost effective method to comply with nitrogen based water quality regulations. And dairies have traditionally bought almond hulls to feed to their cows. Thus, agriculture often has its own complex ecosystem where simple substitution fails to consider additional impacts.

There are also technological and regulatory barriers that either limit or prohibit the types of water transfers assumed in the model. The SED assumes growers can substitute pumped groundwater for some amount of lost surface water supplies. Not all farmers could afford this new infrastructure, however. Furthermore, the ability to substitute pumped groundwater beyond sustainable levels would not be allowed following SGMA implementation.

Water also can't simply be diverted between fields to service higher value crops. Irrigation districts often have rules limiting or prohibiting intra-district transfers. Although it appears inter-district transfers weren't included, any modeling assumptions that allow movement of water out of basin, area of origin, or county, may have their own prohibiting or limiting rules, policies, and laws. Such transfers may also not be technologically feasible given a lack of connecting pipelines or available capacity.

The SED should realistically analyze water supply impacts to almonds through making water transfer assumptions realistic, including vetting by water districts of assumptions to ensure accuracy. There should also be a sensitivity analysis for these and similar assumptions, to estimate a level of accuracy for and range of potential economic impacts.

Volatility impacts not analyzed

Because almonds are a permanent crop with a high initial investment and Return on Investment of 5-10 years, reliable water sources are a foundation for financial success. The greater water supply volatility

²² SED p.13-61

²³ SED pp.11-2, 41; and Section G.4.1

under project conditions, particularly in dry and critically dry years, has the potential to harm almond production in ways that aren't fully analyzed in the SED, both for growers and associated hullers, processors, and manufacturers.

Although the drought of 2011-2016 is used as an example of agriculture's resiliency in the face of reduced water supply,²⁴ droughts are temporary while proposed unimpaired flows are semi-permanent. Since reliable water sources are a foundation for high-value permanent crops, increased water supply volatility and overall reduced supplies will harm almond farmers' ability to get long-term loans. This was highlighted in the testimony of Leonard Van Elderen from Yosemite Farm Credit in Modesto. Lack of water will also affect underlying land values, impacting tax revenues and intergenerational farm transfers.

Volatility impacts should be incorporated into the SED analysis.

Unclear method of analyzing impacts to a permanent crop

Under the preferred alternative 3, the SED estimates significant and unavoidable impacts annually to approximately 22,879 acres, on average, of Prime or Unique farmland or Farmland of Statewide Importance.²⁵ Even with the inaccurate assumptions and qualifiers listed above, the SWAP analysis still estimates almond acreage annual losses within irrigation districts of approximately 157, 529 and 1,527 acres for alternatives 2, 3, and 4, respectively.²⁶

What these acreage impacts mean is not clear, but conceivably is quantified in the total estimate of \$64M in economic impacts. Do the acreage impacts mean removed trees, lost productivity, or something else? Assuming these figures are correct, and that is large assumption as they have been disputed by the various water districts and affected counties, with capital costs of \$25,000 per acre,²⁷ a loss of 1,527 acres would result in at least \$38,175,000 of lost investment for the almond industry alone. This makes the \$64M total estimated impact for agriculture grossly understated. Additionally, there will be a loss in net income, land values, and other economic multipliers.

As mentioned, reduced water supplies in a single year have been shown to have an impact on overall production for several years on almond trees (stress this growing season affects the bloom in the following growing season).

Since economic impacts aren't separated out by crop, there isn't a way to confirm how impacts to permanent crops such as almonds were estimated and modeled. Water Board staff responses to questions during hearings seeking to resolve how the SED analyzed impacts to permanent crops were also confusing, and follow up questions seeking clarification weren't answered.

The SED analysis should resolve what is meant by annual impacts to permanent crops and clearly state how these impacts are quantified in the economic analysis by providing line item impacts for each crop.

²⁴ SED p. G-16

²⁵ SED Impact AG-1 p.18-47. SED Table 11-17 figure is 23,679 acres.

²⁶ SED pp. G-49 to 54

²⁷ Sample Costs To Establish An Orchard And Produce Almonds- San Joaquin Valley South. 2016. UC Cooperative Extension. https://coststudyfiles.ucdavis.edu/uploads/cs_public/87/3c/873c1216-f21e-4e3e-8961-8ece2d647329/2016_almondsjv_south_final_10142016.pdf

Incomplete analysis of affected irrigation districts

Although the Eastside Water District and Ballico-Cortez are identified as receiving some portion of their supply from TID, potential reductions in their surface water supply and economic impacts aren't further analyzed.²⁸ Madera Irrigation District receives a portion of its irrigation supplies from Big Creek, a tributary to Merced River, but potential impacts to its customers aren't analyzed.

There are additional water districts that receive some portion of their water supply within the Plan Area, but potentially outside the flow measurement compliance points. These include Banta-Carbona, South Delta Water Agency, and West Stanislaus Irrigation District.

If the Project will impact these districts and their agricultural operations, they need to be included in the SED analysis.

Inaccurate almond acreage estimates

The SED estimates almond acreage within both DWR's Detailed Analysis Units and irrigation district boundaries. These figures significantly underestimate current almond acreage and resulting negative economic impacts given almonds' higher value and recent acreage expansions.

Within the Plan Area of San Joaquin, Stanislaus, and Merced Counties, the SED estimates 238,996 acres of almonds partially based on 2010 ag commissioner reports. This includes 115,111 acres of almonds inside and 123,885 acres outside of irrigation districts included in the SED analysis.²⁹ This totals 238,996 acres.

The ABC has contracted with consultant LandIQ to prepare estimates of almond acreage based on analysis of satellite imagery.³⁰ These estimates, which have a 96% accuracy, are also used by DWR, and provide an even more precise figure than that used in the SED. Within the irrigation districts analyzed in the SED, the ABC estimates that as of 2016, there were 170,993 acres of almonds. This compares to 115,111 acres in the SED.

There are other irrigation districts that aren't listed as part of the economic analysis, but appear to receive at least a portion of their water supply from surface water sources affected by the Project. A list of these districts follows, with almond acreage in parentheses: Merquin County Water District (226), Plainsburg Irrigation District (2,991), Ballico-Cortez Water District (3,834), and Eastside Water District (40,866). Together, this is a total of 47,917 acres of almonds that may be affected by the Project, but weren't included in the economic analysis.

Additionally, there are large almond acreages outside irrigation districts that depend on groundwater. As discussed above, the groundwater basins that they draw from will be impacted by the Project,

²⁸ SED p.9-19

²⁹ Central San Joaquin Water Conservation District, Stockton East Water District, South San Joaquin Irrigation District, Modesto Irrigation District, Oakdale Irrigation District, Turlock Irrigation District, Merced Irrigation District, Le Gran-Athlone Water District, and Stevinson Water District

³⁰ For LandIQ analysis methods and map see attachment.

affecting their agricultural operations as well. Within the DAUs analyzed by the SED, outside of the irrigation districts listed above, we estimate there are an additional 64,557 acres of almonds.³¹

As previously described, there are additional water districts that receive some portion of their water supply within the Plan Area, but potentially outside the flow measurement compliance points. A list of these districts follows, with almond acreage in parentheses: Banta-Carbona (153), South Delta Water Agency (8,858), and West Stanislaus Irrigation District (7,619).

Madera Irrigation District also receives a portion of its irrigation supplies from a tributary to Merced River and has 38,445 acres of almonds, but potential impacts to its customers aren't analyzed.

Accurate numbers based on these updated sources should be used to adjust almond acreage estimates inside and outside irrigation districts as well as the estimated economic impacts to almonds and other agricultural crops. Furthermore, the irrigation districts dependent on surface water diversions should be updated.

Trees grown outside districts are both dependent on groundwater recharge from surface irrigation within irrigation districts and negatively impacted when crops within districts pump more groundwater in exchange for lost surface water diversions.

Impacts to crops outside irrigation districts should therefore be included in the SED's economic impact analysis.

Economic Linkages

A report prepared for the ABC by the UC Agricultural Issues Center, "*The Economic Impacts of the California Almond Industry*," describes the significant contributions the California almond industry makes to the California economy. Almond production and value have been growing rapidly in recent years. California almonds are especially important in international trade, accounting for about 25 percent of California farm exports in value.

Although its economic benefits are statewide (and global), the almond industry is especially important to the economy of the California Central Valley. For the 2014 crop, the report determined that, including direct, indirect, and induced economic outputs, total value was \$21.5 billion. Of this total, about \$11 billion is value added, with \$7.6 billion attributable to almond farming, and the remaining \$3.4 billion contributed by the almond processing and manufacturing sectors. Almond production requires multiple stages, moving from farms, through almond hulling and shelling, almond handling and initial processing, and finally to almond manufacturing. These ultimately lead to the retail sales of almonds and sales to domestic food processors or exports. The whole almond industry, including processing and marketing, generates about 104,000 jobs statewide, three quarters of which are outside of farm production.

Researchers adapted the IMPLAN model to fit the specifics of the industry, partially through additional data provided by almond industry members. The model and data specify linkages (indirect effects) from each segment of the almond industry to associated input industries including farm inputs, such as fertilizers and tractors, as well as equipment and materials used in hulling and shelling, handling and

³¹ DAUs: 182,205,206,207,208,209,210,211,212

manufacturing including transportation. It traced the influence of income earned in the almond industry (induced effects) as it ripples through the economy because of purchases by employees and owners of farms and almond marketing firms.

The reliable supply of almonds encourages additional investment in processing facilities that increase the economic value of the raw material (milk, butter, flour, etc.) as well as expansive supporting industries which not only produce jobs, but help growers farm more efficiently, sustainability, and effectively. It appears that these types of forward linkages and multiplier effects within the almond industry related to associated hullers, handlers, and manufacturers of processed products, aren't quantitatively estimated by the SED.³²

The ABC report estimated an economic multiplier of \$2.71 for every \$1.00 in output by the almond sector.³³ This compares to a multiplier for tree nuts of 1.70 used by the SED, resulting in an underestimate of around 37% in economic impacts to almonds.

The SED should use the information in the UC Agricultural Issues Center report to adjust their estimate of the economic benefits of almonds and therefore Project impacts.

County economic analyses confirm greater impacts

A pending separate economic analysis by San Joaquin, Stanislaus, and Merced Counties hasn't been released, but in testimony, staff describes a different bottom line impact partially based on issues discussed above. Speakers also noted the greater dependence on agricultural production and processing by this region, relative to the rest of the state, contributing significantly to economic development. Merced has released its own report saying, "The models do not estimate structural changes that could result from a long-term change in surface water supply." This report highlights how reductions in economic output in the Northern San Joaquin Valley stemming from this proposal are more significant given the region's higher rates of poverty. In general, the region is "beset by high unemployment and other impacts of a lingering recession and drought."³⁴

Furthermore, over 91% of California's 6,800 almond farms are family farms, 73% are less than 100 acres, and are owned and operated by third- and fourth-generation growers.³⁵ With additional costs for supplying water harming their bottom line, these small businesses may cease operation and be forced to sell their land, abandoning an agricultural heritage. This impacts California's rural landscape and economic base.

Conclusion

In conclusion, the Project is misguided; and the SED is deficient due to the identified concerns, issues, and data inaccuracies identified in the comments above.

³² SED section G.5

³³ See Table 1.1 in: Sumner, D., Matthews, W. Medellín-Azuara, J. and Bradley, A. 2014. The Economic Impacts of the California Almond Industry. UC Agricultural Issues Center.

³⁴ See p.ES-7 in: Cardno and Highland Economics. Economic Impacts of Reduced Water Availability to Merced Irrigation District. July 2016.

³⁵ USDA 2012 Census of Agriculture.

- **Project balancing.** Balancing requires developing accurate estimates of benefits for and impacts to all beneficial uses, and selection of the least damaging alternative necessary to achieve fishery goals, maximizing non-flow, adaptive management methods and mitigating impacts to farm water supply. The SED as drafted does not balance benefits and impacts as the impacts have been grossly understated.
- **Stakeholder Engagement and Process.** The Water Board needs to engage and ensure the SED is vetted with irrigation districts and agricultural stakeholders, update the SED with missing germane fish science, and correct the SEVERE underestimation of water supply and agronomic impacts. Negotiated agreements need to address this collaborative shortcoming, while accounting for the complex and simultaneous state and federal policy and regulatory processes.
- **SGMA policy conflicts.** It is inappropriate to use a “speculative” analysis to assess the impacts of project implementation without combining it with recent groundwater legislation. Doing so creates a major policy conflict for farmers and system operators, and the livelihoods of Central Valley farmers and their employees cannot be destroyed based on speculation. Using a “speculative” analysis that leaves out SGMA also limits conjunctive management, groundwater recharge, and storage opportunities. It is the responsibility of this Water Board to take a holistic and statewide approach to agricultural water policy and planning; growers must comply with all regulations, and it is a complete injustice for the Water Board and other water agencies to operate in silos.
- **SWAP economic analysis.** The amount of errors, omissions, and unsupported assumptions, including grossly underestimated acreage, is astounding. We have identified that under one scenario there is a potential impact to almonds alone of over \$37M -- over half of the total estimated agricultural impact of \$64M. Additionally, the analysis incorrectly assumes the farmers’ ability to transfer reduced water supplies to higher value crops such as almonds which results in **significant** underestimation of economic impacts. The Water Board needs to work with water districts and the local counties to identify the true economic impacts of this project.

The ABC and the Alliance stand ready to work with the Water Board on improving the project and analysis, including development of negotiated agreements, to ensure that farming’s long-term prospects and sustainability are enhanced, alongside the increased sustainability of the region’s fisheries.

Thank you for the opportunity to provide these comments.

Sincerely,



Kelly Covello
President



Gabriele Ludwig
Consultant to the Almond Alliance of California

Attachment: Land IQ Almond Acreage Analysis Methods

MEMORANDUM

California Almond Acreage Determination for Various Boundaries

TO: Jesse Roseman/Almond Board of California

FROM: Justin Sitton and Stephanie Tillman/Land IQ

DATE: February 13, 2017

Remote Sensing Analysis to Determine Almond Acreage

Land IQ's mapping approach draws on multiple lines of evidence including agronomic knowledge, robust on-the-ground verification, publicly available imagery and other third-party resources. The steps to determining acreage are as follows:

Field Delineations: Land IQ has developed orchard delineations that encompass only the irrigated boundaries of every orchard greater than 2 acres.

Ground Truthing/On-the-Ground Verification: The approach also includes a minimum of annual statewide ground truthing efforts encompassing approximately 4,000 miles.

Analysis: Finally, a unique and highly accurate remotely sensed analysis, that has been developed over a half decade of research and development efforts, is employed to locate orchards with greater than 96% accuracy.

GIS Analysis to Determine Almond Acreage Within, Detailed Analysis Units, Irrigation Districts, Counties and Department of Water Resources Groundwater Basins

The field boundary data was joined with each of the following spatial data sets:

1. Department of Water Resources (DWR) Detailed Analysis Unit (DAU)
2. Department of Water Resources groundwater basin boundaries (updated 2016)
3. Irrigation District boundaries
4. County boundaries

The criterion for joining was that the centroid of the field must fall within a boundary to be associated with it. This way, each field was associated with the irrigation district, DAU, county and/or groundwater basin that the centroid of the field fell within. If the field was not within an irrigation district, it was kept separate, called "Outside," and the acreage of fields outside of irrigation districts were totaled. This method was used to determine the total acreage for each county and groundwater basin statewide. For DAU and Irrigation District boundaries, the method was applied only within the project area, so that a meaningful acreage could be determined for fields outside of district boundaries.

