

Review of the Bay Delta Conservation Plan Statewide Economic Impact Report, August 2013 draft¹

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Executive Summary

The “Bay Delta Conservation Plan Statewide Economic Impact Report” (Report, hereinafter) was released in August 2013. The Report is an economic evaluation of the \$25 billion (2012\$) BDCP proposal to build water conveyance tunnels under the Delta and habitat restoration projects. The Report was produced for the California Department of Water Resources by ICF Inc. and The Brattle Group, consultants who have worked extensively on the development of the BDCP. Although the Report is an economic analysis prepared for the Department of Water Resources, it deviates significantly from the Department of Water Resources’ Economic Analysis Guidelines in ways that bias the analysis in favor of the tunnels.

The Report includes two distinct economic analyses of the BDCP proposal; 1) an economic welfare or benefit-cost analysis, and 2) an economic impact analysis on statewide employment and income. Combining these two distinct studies into the Report results in some confusion and inconsistency since some costs that are included in the economic impact analysis are incorrectly omitted from the economic welfare or benefit-cost analysis. Overall, both analyses suffer from high-level structural errors in how the issue is framed, as well as significant errors and biased assumptions in the details of the calculations.

The overall structural flaws of the Report include:

- **The twin tunnels are not analyzed independently.** The Report violates accepted benefit-cost and policy analysis principles by presenting the tunnels and habitat projects as a single package, and creates a false choice that habitat restoration can only occur with the tunnels.

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- **The BDCP is compared to a weak and unrealistic no-BDCP alternative that assumes water agencies do nothing.** This assumption conflicts with the Metropolitan Water District's and other export water agencies' management plans, and incorrectly assumes that water agencies take no actions to comply with the 2009 Delta Reform Act in the absence of BDCP.

Some of the specific problems with the Report include:

- **The Report assumes water agencies make no additional investments in alternative water supplies in California for the next sixty years,** even if Delta water exports further diminish in the future. Thus, the Report makes exaggerated and alarmist claims about the extent and impact of water shortages that directly contradict the export water agencies' planning documents.
- **The Report invalidly changes the baseline level of water exports for the valuation of water supply and environmental benefits.** A scientifically valid report would measure all impacts from a consistent baseline, but the Report varies the no-tunnel baseline for water exports by over 1 million acre feet per year in ways that severely bias the assessment in favor of the BDCP tunnels.
- **The Report grossly overstates future urban water demand by utilizing aggressive and outdated population forecasts and ignoring conservation improvements.**
- **Over \$7 billion in costs paid by taxpayers primarily for habitat are omitted from the Statewide economic welfare analysis,** even though benefits from these investments are included.

Many of the errors and omissions within the Report are directly related to the BDCP's San Joaquin County impacts.

- **The economic costs from the loss of approximately 100,000 acres of Delta farmland to BDCP habitat and tunnel construction are omitted from the Report.**
- **The Report includes an incorrect and biased estimate that a million dollars of crops produced by water exporters creates 48 jobs, whereas a million dollar of crops in the Delta only creates 13 jobs.** The discrepancy is because the Report uses a different methodology for each region of the State covered by the Report. The Report's methodology for agricultural water exporters incorrectly double counts agricultural support services jobs (i.e. labor contractors) and uses multipliers that includes food processing jobs that are excluded from the Delta analysis.
- **The Report ignores the impact of the tunnels on in-Delta municipal and industrial water diversions.**
- **The Report ignores the impact of tunnel construction on existing Delta recreation.**

Many more errors and omissions in the Report are discussed in the detailed review that follows. Overall, the Report exaggerates the benefits of the Delta tunnels by comparing it to an invalid, unrealistic, ineffective and inconsistent description of conditions without the tunnel-based BDCP. Without these extreme assumptions and omissions, the BDCP would not be able to claim that it economically benefits California. It is highly unlikely that a valid and unbiased benefit-cost analysis following the Department of Water Resources' Economic Analysis Guidelines or other broadly accepted frameworks for benefit-cost analysis would find the twin tunnels to be economically justified for California.

In addition, the economic impact results are greatly distorted by the assumption of no alternative water supply investment in the no-tunnel BDCP scenario as well as errors in the agricultural jobs analysis. Simply correcting these two errors in the water supply reliability analysis would reduce the estimated employment gains from BDCP by over 900,000 "job years", a nearly 90% reduction in the claimed 1.1 million "job years" the Report estimates from BDCP. If BDCP were compared to a strong no-BDCP alternative, the BDCP would be unlikely to result in any net gain to California employment.

Introduction

The Report has two main components. The majority of the Report is an “economic welfare” analysis that attempts to satisfy the many requests for a statewide benefit-cost analysis. The second part is an economic impact analysis that attempts to estimate the effect of the BDCP on Statewide employment and income. While there are pieces of useful information and analysis within each part of the Report, the overall effort is fatally flawed by inconsistencies, biased assumptions, and other errors and oversights that inflate the benefits of BDCP relative to an inaccurate and inconsistent portrayal of conditions without the BDCP.

The first part of this review focuses on the inconsistencies and errors of the no-BDCP alternative that greatly affect both the welfare analysis and the economic impact analysis. The second part of this review makes specific comments on the welfare analysis, and the third part provides detailed comments on the economic impact analysis. As long as the no-BDCP alternative is incorrectly and inconsistently defined, any future revisions of the Report will continue to be useless for policy analysis even if all the detailed comments are adequately addressed.

1. The No-BDCP Alternative is Incorrect and Inconsistent

The economics of the BDCP can only be measured by comparing it to no-BDCP conditions. Thus, correctly defining the no-project conditions is essential. Any project can be justified if it is compared to a bad enough alternative. The Report does not have a section which clearly describes a non-BDCP alternative that is utilized consistently throughout the Report. Instead, the scenario to which BDCP is compared varies from section to section of the Report which creates large errors that bias the analysis in favor of the BDCP.

There are three important parts to defining the no-BDCP scenario: a) Delta water exports; b) the level of habitat investment; and c) the level of investment in BDCP alternatives. The Report makes critical errors in all these areas, and in each case the error exaggerates the benefits of BDCP.

1.1. Shifting baselines for Delta water exports: The Report shifts back and forth between Delta water export scenarios that differ by more than one million acre feet per year. The inconsistent baseline is scientifically invalid. It results in extreme overstatements of the water supply and environmental benefits of BDCP. The poorly justified shift away from the EIR/EIS baseline increases the estimate of water supply benefits by over \$10 billion.

The BDCP EIR/EIS defines the scenario without the BDCP as full implementation of the existing biological opinions. Estimates of average annual water exports would be 4.7 maf in 2025 if the tunnels were not built. This EIR/EIS no-tunnel baseline has been used by BDCP for many years. All the environmental analysis done for BDCP impacts has been conducted relative to this baseline. Thus, the economic analysis of the environmental benefits in the Report utilizes this EIR/EIS baseline.

In May 2013, BDCP chapter 9 introduced a new no-BDCP baseline that dramatically lowered the assumed water deliveries from the Delta without the BDCP. This new scenario, called the “existing

conveyance scenario,” imposes the BDCP restrictions on the south Delta pumps without introducing the new north Delta intakes and tunnels. The scenario reduces Delta water exports to an average of 3.4 maf to 3.9 maf, an average decrease of more than 1 maf of water exports compared to the EIR/EIS baseline. The valuation of water supply benefits in the Report uses the existing conveyance scenario. Thus, the Report estimates the water supply increase from BDCP is over 1 maf per year larger than if the Report had utilized the EIR/EIS baseline.

Because it does not include the environmental damage of the north Delta intakes while including the beneficial restrictions on south Delta pumping, the existing conveyance scenario has been said by many to be significantly more protective of fish than the BDCP preferred tunnels project. The Report does not include any environmental analysis for the existing conveyance scenario. Thus, it is invalid to use it as the baseline of a statewide analysis of benefits and costs that assesses both water supply and environmental benefits of BDCP.

If the EIR/EIS baseline was used for the water supply analysis, the BDCP consultants have stated that the economic benefits to the water contractors would be significantly lower than their costs, and the analysis detailed in the BDCP chapter 9 Appendix suggest that the change in baseline would decrease benefits by over \$10 billion. In contrast, if the “existing conveyance scenario” was used for the environmental analysis, the estimated environmental benefits of BDCP to the state would drop substantially and possibly be negative since the significantly lower levels of water exports in the “existing conveyance scenario” are likely to be better for fish and will have lower greenhouse gas emissions than the BDCP proposal.

The failure to use a consistent no-BDCP baseline for water exports across all components of the analysis is a fatal flaw that makes all policy conclusions from the Report scientifically invalid.

1.2. No-BDCP Habitat Assumption. The Report inaccurately assumes that none of the habitat projects included in the BDCP would be implemented in the absence of the BDCP. This assumption is contradicted by the funding plan for BDCP, the Delta Stewardship Council’s Delta Plan, and the 2009 Delta Reform Act which requires significant actions to improve water supply reliability and ecosystem restoration with or without the twin tunnels and BDCP.

Both the welfare analysis and the economic impact analysis quantify significant economic benefits that stem from the construction of restored habitats envisioned in the BDCP. Since these analyses are relative to the no-BDCP baseline, the implicit assumption is that none of these habitat projects would be implemented without the BDCP. The funding plan for BDCP suggests otherwise, as all the habitat investments (except for the mitigation requirements for the tunnels) are funded by existing sources or anticipated water bonds that are separate from BDCP. Every dollar utilized for these habitat investments would still be available for these habitat investments without BDCP, and in most cases the projects would still go forward without BDCP because they are included in the Delta Stewardship Council’s Delta Plan and the 2009 Delta Reform Act requires actions to achieve the co-equal goals.

The economic analysis must define the habitat projects that would be likely to move forward without BDCP. Given the funding plan for BDCP, where the water contractors only pay for the tunnels and

mitigation and public funds pay for BDCP habitat, it is hard to argue that BDCP will result in any net increase in statewide conservation investments over the duration of the project. In fact, it is possible that BDCP could cause conservation funds to be diverted from projects with higher conservation values outside the Delta to implement the BDCP, and thus result in a net statewide loss. Since BDCP does not provide any new resources to Statewide conservation investments compared to a no-BDCP scenario, it is invalid for the report to assume that BDCP results in an increase in statewide habitat investments relative to the no-BDCP scenario.

1.3. Investment in Tunnel Alternatives: The Report incorrectly assumes that the level of investment in conservation and alternative water supplies is the same in the BDCP and no-BDCP scenario.

As discussed later in this review, the baseline urban water supply and demand projections in the Report are founded on an overly pessimistic view of future conservation and development of alternative water supplies. The Report assumes conservation gains slow dramatically compared to the past twenty years, totaling only 250,000 acre feet by 2035, and assumes that less than 200,000 acre feet of water recycling and desalination projects would be completed, for a total of only 450,000 af of new conservation and alternative water supplies. In contrast, the San Diego County Water Authority has identified up to 1,300,000 acre feet of alternative water supplies that are already in the plans of southern California urban water agencies. In addition, this assumption conflicts with integrated resource management plan of the Metropolitan Water District (MWD).² The MWD regional plan includes nearly 700,000 acre feet of new conservation and alternative water supplies in the “Core Resource Strategy” that MWD plans to implement under any future scenario, and an additional 500,000 acre feet of “Uncertainty Buffer” water supplies that MWD would develop if necessary.

Given the pessimistic baseline for conservation and recycling, it is invalid for the Report to assume that there would not be any additional water supply development stimulated by the extreme water shortages the Report forecasts in the no-BDCP existing conveyance scenario. The MWD Integrated Regional Plan describes the “Uncertainty Buffer” as a strategy that calls for additional local resource development that would be triggered by the type of action envisioned in the No-BDCP alternative. This strategy would result in an additional 500,000 acre feet buffer above the Core Resource Strategy that would only be developed if needed. Thus, the Report’s assumption that there would be no difference in conservation and local water resource development with or without BDCP is invalid.

“For example, the imposition of additional and unforeseen environmental and regulatory restrictions could cause significant impacts to water supplies. Under additional restrictions, Metropolitan would need to significantly adapt in order to meet anticipated water demands...”

Through the IRP Technical Workgroups, Metropolitan’s member agencies have also identified various local supply projects that could be implemented and added to the regional supply portfolio if necessary. For the purposes of the rate discussion in Section 4, this additional local supply development is assumed to be up to 300,000 AF regionally. Combined with the 200,000 AF of regional water-use efficiency buffer, the

² <http://www.mwdh2o.com/mwdh2o/pages/yourwater/irp/IRP2010Report.pdf>

total regional buffer could be as much as 500,000 AF. These local supply projects would be developed as needed, based on an evaluation of risk, cost and regional benefit.” (MWD Integrated Regional Plan 2010, page 3-18)

Rather than follow the largest urban water agency’s official plan for how it would respond to a no-BDCP alternative with reduced water exports, the Report paints an unrealistic, do-nothing alternative. The result is an alarmist prediction of economic losses without the BDCP.

1.4. Outline of a Correct No-BDCP or No-Tunnels Alternative

The co-equal goals of the 2009 Delta Reform Act remain the law of California even without BDCP, and non-tunnel conservation measures in the BDCP rely on funding sources that will exist in the absence of the BDCP. A better and more realistic no-BDCP, no-tunnels, alternative would have the following four elements:³

1. Delta water exports that match the BDCP EIR/EIS no-action alternative and are consistently applied throughout all sections of the Report’s analysis.⁴
2. Implementation of most, if not all, of the non-tunnel conservation measures included in the BDCP.
3. Significantly higher investments in conservation and alternative water supplies financed by the tens of billions of dollars saved by not constructing the tunnels.
4. An assumption of higher level of levee investment, and flood protection from seismic and catastrophic events, for both the BDCP and no-BDCP alternatives.

This no-BDCP alternative is not only more accurate and realistic, it also would greatly simplify and clarify the economic study. Since the level of habitat investments and recovery prospects for endangered and threatened fish would be similar in the BDCP and no-BDCP alternatives, the costs and benefits of these actions would mostly cancel each other out when the BDCP and no-BDCP alternative are compared. The resulting economic analysis would then be properly focused on the main decision facing the State with respect to the BDCP: whether or not to build the twin tunnels.

2. Economic Welfare Analysis Comments

³ This alternative is similar to the recommendations of the Delta Protection Commission’s Economic Sustainability Plan adopted in January 2012. The DPC is a State agency with representation from in-Delta communities and State agencies and has taken an official position in opposition to the BDCP’s proposed project that is centered around the twin tunnels. The DPC’s Economic Sustainability Plan can be found at <http://forecast.pacific.edu/desp.html> or http://www.delta.ca.gov/res/docs/ESP/ESP_P2_FINAL.pdf . The executive summary is at this link http://www.delta.ca.gov/res/docs/ESP/ESP_ES_FINAL.pdf .

⁴ A lower level of water exports than the EIR no-action alternative could be utilized if there were a complete analysis of the environmental benefits of such an alternative so that the lower level of water exports could be consistently applied throughout the entire Report. At this point, there is no environmental analysis of the so-called Existing Conveyance Scenario used in the Report and Chapter 9 of the BDCP. Thus, the EIR/EIS no-action alternative is the only defensible no-tunnel alternative for water exports with the necessary information for a complete economic welfare analysis.

Most of the Report consists of the economic welfare analysis which BDCP asserts is equivalent to a statewide benefit-cost analysis. However, the economic welfare analysis has a number of serious shortcomings and falls short of the standards laid out in State and Federal benefit-cost guidelines. As discussed above in Section 1 above, it is critical that the Report's analysis compares the proposed project to strong and likely no-project alternatives. Instead, the Report uses a weak and unlikely scenario for comparison. If the Report were to use a strong no-BDCP alternative as described above, it would also resolve many of the criticisms of the economic welfare analysis listed below.

2.1. The tunnels must be analyzed and justified separately from the habitat investments according to standard benefit-cost principles, including those published by the State Department of Water Resources.

The Report co-mingles effects of the tunnels with habitat repeatedly. Benefit-cost guidelines are clear that conveyance and habitat elements are separable and should be justified independently. If the no-BDCP alternative were defined as described in Section 1 above, this issue would be less important since there would be little difference in the habitat enhancement in the BDCP and no-BDCP alternative. In addition, many of the criticisms below would not be relevant if the benefit-cost calculations were focused solely on the tunnels.

2.2. The Report analysis ignores BDCP costs that are not paid by the water contractors. Thus, over \$7 billion in costs paid by taxpayers primarily for habitat are omitted from the calculation of statewide net benefits.

The absence of non-contractor BDCP costs from the economic welfare analysis portion of the Report is a glaring omission. Table ES-2 of the Report summarizes the statewide welfare changes from implementing does not include over \$7 billion in BDCP costs that would be paid by State and Federal taxpayers. Simply including this important cost would substantially change the result of \$5 billion present value of net benefits. The Report provides no explanation for this important omission.

During the public meeting on the Report, the consultants reportedly stated that they intentionally omitted this cost because they had not quantified all the non-market values of BDCP habitat restoration. This is an invalid excuse since the Report did calculate many non-market benefits from restoration, but omitted all of the costs. In addition, as discussed below, there are many non-market benefits and costs from implementing BDCP that are left out of the Report's analysis and it is not clear that BDCP is even a net positive for these non-market values. This is another issue that would be less important if the no-BDCP alternative were defined as described in Section 1 above, or would be irrelevant if the benefit-cost analysis was properly focused on the tunnels alone.

2.3 The economic costs from the loss of approximately 100,000 acres of Delta farmland to BDCP are omitted from the calculation of statewide net benefits.

It is surprising that this cost is omitted from the Report's welfare analysis since most of it is included in the economic impact analysis (see Table 5.1-8 which includes agricultural land loss from all the conservation measures except the tunnels). The loss in producer welfare from the estimated \$89

million loss in Delta agricultural production would likely result in a present value loss of economic welfare of between \$500 million and \$1 billion that should be included as a cost in the Report's welfare analysis. This is another issue that would be irrelevant if the benefit-cost analysis was properly focused on the tunnels alone.

2.4. The Report uses an aggressive, outdated population growth scenario for the State that overstates the number of future water consumers by several million.

The excessive population forecast in the Report results in a large overstatement of future growth in water demand, and subsequently overstates future water shortages and the value of water supply reliability. The California Department of Finance has updated population growth projections based on the 2010 Census, as well as updated data on fertility, mortality and migration. As a State planning document, the BDCP should be consistent with CA DOF projections. It appears that BDCP study has 5 million too many urban residents in 2050 compared to current projections, which suggests urban water demand and the resulting shortages are overstated by at least 500,000 af per year. The information about the forecast of future water demand is in BDCP chapter 9, appendix A, and is incorporated by reference into the Report.

2.5. The Report's analysis contains an unrealistically pessimistic view of future water conservation.

The Report's water demand forecast assumes that very little new water conservation is adopted in urban areas that receive exported water from the Delta. The information about the effect of conservation on the forecast of future water demand is in BDCP chapter 9, appendix A, and is incorporated by reference into the Report.

2.6. The Report's analysis pessimistically assumes no technological improvements in alternative water supplies and conservation.

The Report's calculation of future water supply reliability benefits assumes fixed technology for alternatives and conservation through 2075. In reality, technological improvements are already underway and more can be reasonably expected to result in significantly lower costs for alternative water supplies in the future. This assumption is embedded into the forecast of future water demand and valuation of future water supply reliability in BDCP chapter 9, appendix A, and is incorporated by reference into the Report.

2.7. The valuation of reduced seismic risk to export water supply is a strong point of the Report, but may still be an overstatement when compared to an equally strong BDCP alternative.

Compared to the incorrect scare tactics of the BDCP public relations campaign, the relatively modest estimate of \$470 million in seismic reduction benefits is an important point of the report. It correctly accounts for the fact that, even with the tunnels, water exports would still be significantly curtailed by a massive earthquake and flood event that disabled the south Delta pumps. The largest amount of seismic protection for water exports is achieved by a strategy that invests in a seismically resilient levee system. Such an investment would make sense not just to protect water exports, but also to protect

public safety, tens of billions of dollars in other critical transportation, energy and water infrastructure in the Delta, private property, farmland, and to protect against environmental damage from levee failures.

It could be argued that the BDCP provides zero or negative seismic risk reduction benefits for two reasons. First, if seismic levee improvements are made to the Delta to protect other infrastructure and water supply, then the incremental seismic protection benefits of the tunnels are near zero. Second, building the tunnels reduces the probability of investment in a seismically-resilient levee system because politically-influential water exporters will be less willing to support this investment. Thus, if the tunnels result in a lower overall level of seismic protection in the Delta, the construction of the tunnels result in a net decrease in seismic flood protection in the Delta on a statewide basis. Finally, it should be noted that the seismic failure probabilities in BDCP study are based on the DRMS report, which is thought by many engineers to be exaggerated and which utilizes outdated historical information on Delta levees that does not account for significant improvements that have been made in recent decades.

2.8. The Report's finding that Delta salinity will be little changed by BDCP is unsubstantiated and inconsistent with policy actions of the Department of Water Resources and commitments in the draft BDCP.

The Report uses a sound economic model to relate changes in Delta salinity to changes in Delta crop production. The finding in the Report of minimal salinity effects does not stem from the economic model, but from DSM-II modeling results provided by the Department of Water Resources that supposedly find that implementing the BDCP will have little effect on Delta salinity. The Report provides no references to a document with the modeling results or the results themselves. Thus, the Report offers little explanation and no scientific substantiation for the controversial and counter-intuitive result that diverting an additional 3 million acre feet of fresh water from the Sacramento River has little to no effect on Delta salinity. On page 3.1-11, the Report states that salinity in the south Delta is actually expected to decrease because of implementing the BDCP, in part due to "increased freshwater flows from the San Joaquin River." This is a plausible explanation for how Delta water quality might be maintained if the north Delta intakes and tunnels are built, but it should be noted that the "Existing Conveyance" scenario used as the baseline in the Report includes a substantial reduction in exports from the South Delta compared to current conditions or the EIR no-action alternative. The average baseline salinity level reported in the Report looks like current conditions, which adds further confusion as to which baseline is being used. This may be another case where the Report is plagued by the shifting baseline, and is another reason why the DSM-II results need to be clearly displayed for the "Existing Conveyance" scenarios, the BDCP scenarios, EIR no-action scenario and existing conditions. The Report needs to provide the detailed modeling results that are the basis of this controversial claim.

Furthermore, the Department of Water Resources should stand behind the modeling results by putting Delta water quality assurances within the BDCP that match their modeling. Without such documentation or policy assurances, the approach in the DPC Economic Sustainability Plan, based on water quality degradation consistent with the State's policy proposals, is more valid. In the absence of such assurances, Delta agricultural users face increased uncertainty about water quality if the BDCP is implemented. Undocumented computer modeling results, upon which the Report relies, do nothing to

alleviate that uncertainty in the absence of enforceable Delta water quality commitments within the BDCP itself.

2.9. The Report is unbalanced in its consideration of regulatory uncertainty. The value of reducing uncertainty to water exporters is considered, whereas increased uncertainty in other regions of the State is ignored.

BDCP documents note how climate change could reduce freshwater availability and reservoir levels in the future. Upstream water interests are concerned that the assurances BDCP provides to water deliveries outside the area of origin could destabilize future water availability in their regions. This increase in uncertainty has an economic cost that is ignored in the Report. Furthermore, the BDCP increases uncertainty for in-Delta interests, including water quality issues and the large “Restoration Opportunity Areas” that create uncertainty over land use and property values. The Report is unbalanced in that it values the uncertainty-reducing benefits of BDCP to some interests, but ignores the uncertainty-increasing effects of BDCP on other interests. On a statewide basis, many aspects of BDCP are properly seen as transferring risks rather than reducing risks.

2.10. The Report’s discussion of recreation impacts is unbalanced and uses an incorrect no-BDCP baseline. It does not quantify large negative impacts associated with the tunnels, while crediting significant speculative recreation benefits to BDCP that may also occur in the no-BDCP scenario.

This section of the Report is poorly documented and explained. The Report only presents qualitative discussion of important negative impacts of the tunnels even those these impacts that physically disrupt recreation sites and water levels with historical usage levels are the easiest to estimate with real data. Instead, the researchers use a benefit transfer toolkit to make speculative assessments of increased recreation from increased conservation acres. The Report ignores other research on Delta recreation and fails to compare its baseline estimates of visitor counts to known data to validate the modeling. The Report ignores dozens of negative comments from Delta recreationists about BDCP, and makes no effort to collect quantitative and qualitative data from local recreation providers. While there are lots of numbers in this section of the Report, the most important numbers are missing. For example, the Report shows the estimated change in visitor levels, but does not provide the estimated visitation levels with and without BDCP, so that the results can be tested for reasonableness. The Report is unclear whether the increased visitation is driven by non-BDCP factor such as population or income growth. Most importantly, the Report’s modeling appears to increase estimated recreational visits for substantial amount of acreage while the Report acknowledges that recreational access may not be significantly changed. For example, much of the conserved acres are conservation easements, not fee simple acquisition, and the Report states that visitor access may be restricted in many conservation areas. The BDCP makes no provision for increasing recreational facilities that would be needed to support the increased visits. The Report downplays the disruptive effects on boat navigation and the loss of existing recreational facilities from BDCP. Overall, this section of the Report simply has an unacceptable bias from not quantifying substantial and important negative impacts, while overstating and quantifying benefits from BDCP that may also occur in the no-BDCP scenario. Since the main difference between the BDCP and a reasonable no-BDCP scenario is the water conveyance tunnels

proposal, the recreation impacts of the tunnel construction and operation should be prioritized and quantified. It is highly unlikely that BDCP would result in recreation benefits and could result in net losses to recreation benefits.

2.11. Significant negative groundwater impacts in the Delta are ignored in the Report.

Delta communities will be negatively impacted by dewatering required for construction of the tunnels, and some habitat development could also negatively affect groundwater resources in the Delta. These significant in-Delta economic impacts are discussed in the BDCP's EIR/EIS, but are ignored in the Report.

2.12. The Report's in-Delta urban water quality losses are not quantified, utilize an incorrect baseline, and do not discuss several important contaminants such as methyl mercury and organic carbon.

The Urban Water Treatment section of the Report appears to be taken from the EIR/EIS, and does not appear to be consistently using the "Existing Conveyance Scenario" as the baseline. Since the "Existing Conveyance Scenario" has substantially lower exports than the EIR/EIS no-action scenario or existing conditions, it is likely to result in lower salinity in several in-Delta locations. In addition, this section of the Report discusses water quality changes at the Banks and Jones pumping plants, and these water quality benefits are already quantified in an earlier section of the Report that values the benefits of BDCP to water exports. In addition to double counting water quality benefits to export water agencies in two sections of the Report, this section of the Report ignores the potential impacts on the City of Stockton's new in-Delta water supply intakes.

The section of the Report does not discuss concerns of urban agencies about methyl mercury and organic carbon contamination from the BDCP. Overall, the biggest problem with this section of the Report is that it uses an incorrect baseline and offers only a qualitative discussion of benefits. The lack of economic valuation of these effects is inexcusable since the Report researchers went to great effort to quantify water quality benefits to the export agencies but did not bother to quantify water quality costs to other urban water agencies.

2.13. The Report's commercial fisheries analysis is invalid and biased, because it does not use the same no-tunnel baseline scenario as the water supply analysis.

The assessment in this section of the Report uses the EIR/EIS baseline instead of the "Existing Conveyance Scenario" that imposes BDCP pumping constraints on the south Delta and has far lower water exports than the EIR/EIS baseline. The Report provides no environmental analysis of the "Existing Conveyance Scenario", but it is thought by some experts to be more beneficial to salmon than the BDCP since it includes the benefits of BDCP pumping reduction in the south Delta without imposing the harmful effects of the new North Delta intakes. Thus, if compared to a consistent baseline as the water supply analysis, the commercial fishery effect of BDCP would be a cost, not a benefit. In addition to the wrong water export baseline, the Report's assessment takes credit for salmon improvements from habitat projects – like the Yolo bypass enhancement – that are likely to be implemented without BDCP. Finally, the Report's discussion of chinook salmon benefits is taken from the EIR/EIS which has been

challenged by fishery experts, so the Report may be overstating BDCP benefits to salmon even without the problem of the invalid baseline.

2.14. The Report's air quality and greenhouse gas emissions analysis are incorrect because they do not use the same no-tunnel baseline scenario as the Report's water supply analysis.

The "Existing Conveyance Scenario" used in the Report's water supply analysis has much lower water exports and water pumping south of the Delta. Thus, the Report's analysis grossly understates the increase in electricity consumption from implementing the BDCP, and also greatly underestimates the greenhouse gas and air quality costs of implementing the BDCP. If the "Existing Conveyance Scenario" baseline were used, the incremental amount of water exports resulting from BDCP would more than double, and the incremental greenhouse gas cost from the additional water pumping would double as well. Based on the results in the Report, the cost of BDCP would increase by roughly \$100m to \$250m if a consistent baseline were utilized.

2.15 The Report's flood risk section assumes that there will be no difference in levee investment between the tunnel and no-tunnel scenarios.

A more realistic and correctly specified no-BDCP scenario would include a higher level of levee investment than the BDCP. The Delta Stewardship Council Delta Plan calls on the State to create a levee assessment district that will assess levee beneficiaries to generate resources for flood protection and emergency response. BDCP would reduce the benefits of the levee system to water agencies and would result in a lower assessment and thus fewer funds to invest in the levee system. In addition, it would also reduce the incentive of the Department of Water Resources to allocate public funds to these projects because the levees would be of less value to the State Water Project. Finally, the Report's qualitative discussion of BDCP flood control takes credit for flood bypasses and other conservation measures that reduce flood risk, are part of the Delta Stewardship Council's Delta Plan, and are likely to be implemented with or without the BDCP.

2.16. Property value benefits from BDCP open-space habitat are overstated in the Report. Development of farmland open space is already severely restricted in the Delta such that the BDCP will not increase open space.

Between the land use restrictions of the Delta Protection Commission, the Delta Stewardship Council, floodplain designation, and restrictive agricultural zoning from Delta Counties, Delta agricultural lands already have some of the strongest development restrictions to be found anywhere. As a result, it is unlikely that Delta property owners will experience significant benefits from additional open space protection from BDCP. In fact, there could be conflict between agriculture and endangered species habitat on adjacent properties that increase regulatory risk and lower the value of Delta farmland. Finally, it should be noted that the north Delta area where the negative construction and operations impacts of the tunnel intakes will occur is the most populated portion of the Delta and has the highest value real estate in the Delta Primary Zone.

2.17. Including non-market values for endangered species protection in the Report could result in additional costs from implementing BDCP.

The Report should account for the non-market value associated with the protection of endangered and threatened species. Since the low-export “Existing Conveyance Scenario” is likely to be more protective of fish than the BDCP, there would be a non-market cost associated with BDCP. Due to the use of the “Existing Conveyance Scenario” as the baseline, the Report is omitting non-market costs to endangered species resulting from not implementing the enhanced flows in this Scenario. These values could be considerable.

Instead of focusing on the more important non-market valuation of improving fish populations, the Reports’s consultants have stated that they may provide non-market values for habitat restoration to increase BDCP benefits in a future revision of this Report. As discussed above, there may not be a meaningful difference in habitat restoration if the BDCP and no-BDCP alternatives are defined correctly. However, if the Report’s consultants do estimate non-market values for habitat development, it should also be noted that this development eliminates existing non-market values for the preservation of prime farmland. Prime farmland, as found throughout the Delta, provides non-use societal values similar to habitat. The public value placed on the preservation of prime farmland is manifested through a variety of policies that subsidize the preservation of or otherwise work to preserve farmland for public benefits. The BDCP would convert large amounts of farmland to habitat, and it is not clear at all whether the non-market values of prime farmland that is eliminated is higher or lower than that of habitat restoration. Any non-market valuations of restoration must be net of the lost non-market values of farmland. This is another controversial issue could be largely avoided if the no-BDCP alternative were properly specified as discussed in Section 1.

3. Income and Employment Impacts Comments

The Report’s economic impact analysis is separate from the economic welfare analysis discussed above. Some issues, like loss of agricultural land to habitat projects and taxpayer costs, are included in the Report’s economic impact analysis but are excluded from the economic welfare analysis. The combination of two analyses into one report and the inconsistent treatment of impacts between the two analyses creates confusion. For example, including taxpayer costs in the Report’s economic impact analysis does not minimize the error from excluding these impacts from the Report’s welfare analysis.

The incorrect no-BDCP scenario described in section 1 of the Report is a source of major errors in the Report’s economic impact analysis. In fact, the Report’s incorrect assumption that there are no additional alternative water supplies developed in urban areas drives most of the results in the Report’s economic impact analysis. It is worth noting that there are well-known problems with applying a static input-output model such as IMPLAN to the types of long-run macroeconomic effects considered in this section of the Report, and those weaknesses and the possible overstatement of impacts from the modeling approach should also be acknowledged.

3.1. Urban Water Supply Reliability Impacts Are Grossly Overstated in the Report. If Metropolitan Water District and other agencies follow their own plans for investment in alternative water supplies and conservation, there will be no water shortages for commercial and industrial activity if the tunnels are not built and thus no economic impact.

3.2. Employment Impacts From Agricultural Water Supply Reliability Are Grossly Overstated in the Report. The Report includes an incorrect and biased estimate that a million dollars of crops produced by water exporters creates 48 jobs, whereas a million dollar of crops in the Delta only creates 13 jobs.

The discrepancy is because the Report uses a different methodology for agricultural water exporters and Delta agriculture. The Report's methodology for agricultural water exporters incorrectly double counts agricultural support services jobs (i.e. labor contractors) and uses multipliers that includes food processing jobs that are excluded from the Delta region analysis. A consistent estimate for the SJ Valley agriculture region would have entered the change in agricultural revenue into the IMPLAN model in the same manner that was done for Delta agriculture region. Instead, the Report's analysis uses an econometric estimate of how water deliveries effect both direct farm employment and indirect agricultural services employment. Then, the Report's analysis incorrectly applies an employment multiplier derived from IMPLAN that includes both food processing and agricultural production. There are two large errors in this portion of the Report. First, the econometric model already includes indirect agricultural employment in its estimates, so applying an IMPLAN multiplier to these results double counts indirect jobs. Second, the multiplier is not for agricultural production but an aggregate industry that includes food processing and has a larger multiplier than just agricultural production. This is inconsistent with the treatment of Delta agriculture, and creates the nonsensical finding that a dollar of agricultural revenue in the Westlands Water District creates nearly four times the employment of a dollar of agricultural revenue in the Delta.

The bottom line is that there should be no significant difference in the employment multiplier between two agricultural regions in the Central Valley. Dr. Sunding, the lead Report consultant, used this econometric model in two other studies (a declaration he submitted on behalf of the water exporters in 2011 for a Federal court case regarding the Delta Smelt and Salmon biological opinions and an article in the UC ARE Update newsletter) but he did not apply a multiplier to his estimates of agricultural employment change in these other studies.

3.3. Correcting the Report's errors in the urban and agricultural water supply reliability analysis would reduce the estimated employment gains from BDCP by over 900,000 "job years", a nearly 90% reduction in the claimed 1.1 million "job years" the Report estimates from BDCP.

3.4 The Report's calculations of employment impacts of building the tunnels are very small relative to the enormous public expenditure, generating only 7.8 years of employment per \$1 million in public spending. This part of the Report's analysis is actually quite good, and generates a low employment number because of heavy spending on imported components and equipment, as well as concrete and other materials, that generate few jobs. Investing in alternative water supplies will generate far more

employment per dollar spent, and thus a correct no-BDCP scenario with alternative investments could create more jobs than BDCP.

3.5. Agricultural land acquisition is a conversion of wealth from one form to another, and is incorrectly modeled in the Report as an increase in income in the Delta. There is no reason why such a wealth shift would increase consumption over the 50 year BDCP period, especially since alternative investments with that wealth could be less profitable than farming. In addition, there could be debt against the acquired property that would have to be paid off with the compensation and which would reduce the net proceeds. Furthermore, the recipients of the proceeds of the property acquisition in many cases would have lost their homes and their jobs and are very likely to relocate from the area, which could reduce local spending. The Report's statement of positive impact that simply purchasing the land creates 7,000 jobs from increased household spending is incorrect and should be eliminated.

3.6. The Report's statement of losses from increased water rates and taxpayer contributions to BDCP are underestimated due to an incorrect treatment in IMPLAN. BDCP does not include a tax increase to fund public costs. It is a redirection of government spending from other areas to pay water bonds. For households, rate increases are a change to after-tax income, not pre-tax income.

Correctly modeling the State contribution as a decrease in State government spending on General Fund-supported programs, such as education, corrections, and healthcare, will result in much larger in-State losses to employment and income than the Report's approach of only including induced impacts and treating it as a pre-tax income change. For households, correctly treating the change as a post-tax income change will increase the induced effect and losses from BDCP.

3.7. The Report's economic impact analysis excludes the loss of agricultural land from production from the construction of the tunnels. Although fewer acres than habitat, this loss of agricultural production occurs before construction even starts, and thus it is very important because it has impacts over the entire analysis period covered by the Report.

3.8. The Report's rate increase impacts do not account for financing costs. Even though a finance plan remains in development, reasonable estimates of the costs of issuing bonds and maintaining appropriate bond coverage and reserves should be included in the Report because ratepayers will bear these costs.

3.9. The reliability impacts of the BDCP would start very small and grow over time. They would not be fully felt in 2025 even if the impacts really were as large as this Report inaccurately suggests. Properly accounting for the timing of these impacts would reduce the overall economic impact of water supply reliability from the BDCP.