

**USACE Final Evaluator Responses and Panel's Final
BackChecks
to
Final Panel Comments
on the
Sacramento River Deep Water Ship Channel,
California Limited Reevaluation Study and
Supplemental Environmental Impact Statement IEPR**

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Comment 1

It does not appear that actual decision-makers (i.e., shippers, brokers, and consignees) were contacted, in addition to pilots, to verify the assumptions used in the analysis of vessel types and loading practices.

Basis for Comment:

It is logical to anticipate, as the National Economic Development [NED] Analysis of a Channel Deepening Project, 2011 (NED analysis) does (p. 56 and elsewhere), that shippers and receivers will make maximum use of vessel capacity and channel Final to minimize transportation costs. However, other factors such as foreign port limitations or the capacity of onshore storage may restrict vessel sizes or loads. The NED analysis (p. 53) notes such conditions for ammonia. If shippers and consignees do not take full advantage of the greater channel depth for other commodities, there will be fewer benefits.

The NED analysis provides a “general rule” for vessel utilization (p. 54), but the applicability of that general rule to the cargo flows at issue has yet to be verified.

Pilots are familiar with existing practices, but they do not choose vessel types or control vessel loads and are not a definitive information source. The analysis would be stronger and confidence in the utilization projections increased if USACE expectations were confirmed by actual decision-makers, which are typically the shippers, receivers, or ship brokers involved.

Topping off outgoing vessels or partially unloading inbound vessels is an alternative potential means of maximizing vessel utilization and obtaining some of the same vessel utilization benefits without channel deepening. The assumption regarding the lack of deeper ports within the Bay Area for scrap metal (NED analysis, p. 53) is incorrect. Richmond has deeper water, and scrap metal vessels from Redwood City (RWC) have previously topped off there. In the past, incoming vessels bringing aggregates to RWC have unloaded part of the cargo to barges (lightering) at anchor in the Bay to cope with insufficient Final at RWC (Port of Redwood City, 2005). Lightering would appear to be a option for some Port of West Sacramento (POWS) imports (particularly for Cemex, which also has a cement terminal at RWC).

Significance – High:

All project benefits depend on vessel utilization increases.

Recommendation(s) for Resolution:

1. Directly contact those who make vessel size and loading decisions (e.g., shippers, receivers, ship brokers) to verify the report assumption that they will maximize use of vessel capacity and Final as anticipated.
2. If possible, obtain written confirmation of the decision-makers’ intent to maximize vessel size and loading and of the lack of other restrictions.
3. Expand the sensitivity analysis to include a scenario in which shippers and receivers do not take full advantage of vessel capacity and channel depth
4. Confirm statements regarding the availability of other ports for topping off or unloading, and correct the report as required.

5. Investigate the option of lightering for inbound cargoes.
6. If topping off or partial unloading (lightering) are found to be feasible alternatives, address the potential for either or both in an expanded sensitivity analysis.

USACE Final Evaluator Response (#1)

Non-Concur: Each of the shippers was asked during telephone interviews whether or not they would use the additional depth. However, as the comment points out, the discussions with the shippers regarding the use of the potential additional depth was not discussed in the report. We agree that this is an important issue to clarify and that it should receive greater emphasis in the report.

1. Adopt. We will make contact again with the shippers and verify the assumptions on the use of additional draft. We will also attempt to verify the assumption with the ship brokers (whose contact information hopefully can be provided to us by the shippers).
2. Adopt. The Port has stated that they have letters of support from shippers to members of Congress that state their intention to use the additional draft. We will work with the Port and their customers to collect these letters to the extent possible.
3. Adopt. This will be adopted if Recommendation 1 above cannot be fulfilled.
4. Adopt. We will confirm these statements in our discussions with the shippers.

Final BackChecks (#1)

Concur. If shipper and broker responses indicate unambiguously that they intend to use the available draft, the sensitivity analysis in item 3 would be unnecessary. If the responses indicate some uncertainty regarding draft utilization, then the sensitivity analysis would still be advisable.

Literature Cited:

Port of Redwood City (2005). Port of Redwood City Dredging Issues and Impacts, Han-Padron Associates/The Tioga Group, June.

Comment 2

Project documentation is not clear with regard to plans for actual construction and operation of new port facilities, and relies too much on secondary sources.

Basis for Comment:

The net project benefits are contingent on operation of the dormant cement terminal and on construction and operation of terminals for export scrap metal and import biofuels (ethanol). The Sacramento River Deep Water Ship Channel report appears to rely heavily on secondary sources throughout (e.g., the Port Authority) for information on the construction and operation of these port facilities. The status of those terminals is not entirely clear. In particular, it is not clearly stated whether the scrap metal and biofuels facilities will be built and operated in the absence of the overall project, or whether the terminal facility owners would consider other plans or locations for those facilities (e.g., Stockton).

The owner of the dormant cement facility, Cemex, also owns the RWC facility. The planned activation date of the POWS facility and the market coverage and import tonnage split between POWS and RWC are all under Cemex's control. Information on expected cement tonnage through the POWS facility should therefore have been obtained directly from Cemex wherever possible.

Significance – Medium:

Project benefits are contingent on the opening and operation of the scrap metal, biofuels, and cement facilities, and the report needs to be as clear and definitive as possible on those issues.

Recommendation(s) for Resolution:

1. Contact cement, ethanol, and scrap metal projects sponsors directly to clarify the nature and status of their facility and operations plans.
2. Obtain information confirming or correcting report statements regarding plans, timelines, and tonnage, and make any necessary report changes.
3. Determine the planned split of business between the Cemex POWS cement terminal and the RWC terminal owned by the same firm.

USACE Final Evaluator Response (#2)

Concur: The status of these facilities will be obtained from the owners themselves.

1. Adopt.
2. Adopt.
3. Adopt.

Final BackCheck (#2)

Concur.

Comment 3

The market assumptions used in the economic analysis for cement, ethanol, and scrap metal do not appear to take into consideration competition from facilities other than those described in the report.

Basis for Comment:

The NED analysis and the IHS report (IHS, 2011) focus on competition between the ports at Stockton, RWC, and Sacramento. For the critical commodities – cement, ethanol, and scrap metal – the analysis should be broadened to account for potential competition from other existing facilities.

For cement, California Air Resources Board (CARB) information shows that there have been three active cement plants in Northern California (Lehigh Southwest, Hanson Permanente, and Cemex-California) and eight in Southern California.



Source: CARB, 2011.

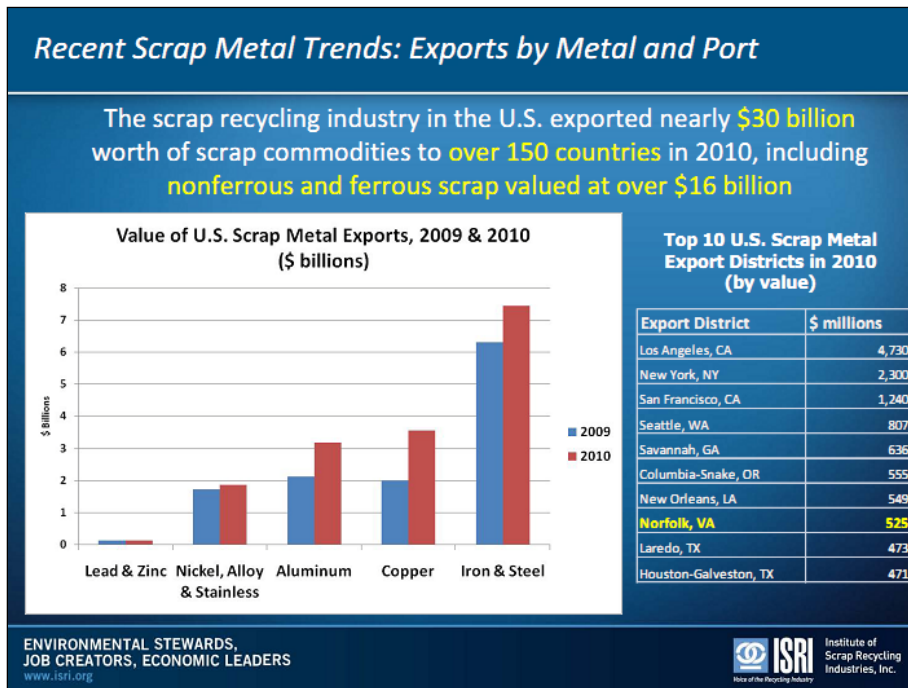
Figure is for illustration purposes only to show the locations.

The POWS facilities appear to be served by rail (based on aerial photos on Google Earth), indicating a capability to compete for markets beyond trucking distance or to receive bulk dry cement from North American sources. This observation suggests that the markets the facility owners expect to serve may be broader than the report indicates. The IHS report (IHS, 2011, p. 25) postulates an initial Cemex cement volume of 100,000

metric tons, without establishing demand or considering diversions from other ports (i.e., RWC), facilities (i.e., the other POWS terminal), or domestic sources.

For ethanol, the study relies on regulatory restrictions on domestic corn ethanol without examining the basic economic competitiveness of domestic sources. The Pacific Ethanol plants in Stockton and Madera have roughly 100 million annual tons of combined under-used capacity, and might be a serious competitive force if California regulations eventually permit corn ethanol or if corn ethanol processing is improved to qualify.

The IHS analysis (IHS, 2011, p. 46) is incorrect in stating that only two metal shredding facilities serve Northern California; in fact, there are three: Sims at RWC, Sims at Richmond, and Schnitzer at Oakland. The IHS comparison of California and Texas (p. 46) appears to be irrelevant since, according to data from the Institute of Scrap Recycling Industries (ISRI), the San Francisco Customs District exports substantially more scrap metals than Texas districts (see below).



Source: ISRI, 2011.

The discussion of scrap metal export competition is therefore too narrow.

Significance – Medium:

Additional analysis of critical commodities to account for potential competition may or may not affect the estimates of net benefits, but broadening the analysis will increase confidence and reduce uncertainty.

Recommendation(s) for Resolution:

1. Determine the status and potential competition from other cement plants and the actual anticipated markets to be served from POWS, and revise the report

accordingly.

2. Revise the projections for cement imports to address the competitive implications of the assumed 100,000 metric tons at start-up.
3. For ethanol, address the competitive economics of the Pacific Ethanol plants in Stockton and Madera in the event that domestic corn ethanol is permitted in California.
4. For scrap metal, analyze competition from Sims in Richmond, Schnitzer in Oakland, and Sims at RWC.
5. Expand the sensitivity analysis as needed to reflect any additional contingencies, including:
 - a) A scenario in which cement imports are significantly reduced (e.g., due to reduced demand, greater utilization of RWC, or domestic competition).
 - b) A scenario in which biofuel (ethanol) imports are absent or are significantly reduced (e.g., due to renewed tariffs, changed California regulations, lower demand, or domestic competition).

USACE Final Evaluator Response (#3)

Concur: The report should improve the description and consideration of other regional facilities. We agree that the inclusion of these facilities may or may not alter the benefits because the firms located at the POWS have stated that their operating at the port is not contingent upon the deepening project.

1. Adopt.
2. Adopt.
3. Adopt.
4. Adopt.
5. Adopt. This recommendation will be adopted contingent upon the results of the information gathered as part of the adoption of the previous four comments.

Final BackCheck (#3)

Concur. However, the Panel notes that given the inherent uncertainty in forward-looking assessments, a sensitivity analysis will probably still be needed.

Literature Cited:

CARB (2011). Cement Plants in California, California Air Resources Board website, http://www.arb.ca.gov/cc/ccei/presentations/cementmap_4_3_07.pdf, accessed September 20, 2011.

IHS (2011). Commodity Forecasts and Competitive Market Analysis for the Ports of West Sacramento, Stockton, and Redwood City, IHS Global Insight, 2011.

ISRI (2011). The Scrap Metal Recycling Industry in the United States. Presentation by J. Pickard, Institute of Scrap Recycling Industries. May 2011.

Comment 4

The market assumptions used in the economic analysis for ethanol do not take into consideration possible changes in regulations or continuances of tariffs.

Basis for Comment:

The IHS forecasts for sugar cane ethanol imports (IHS, 2011) assume that existing tariffs will be allowed to expire, that domestic corn ethanol will be eliminated or greatly restricted in California due to greenhouse gas regulations, and that enough E15 blend-compatible pumps will be installed and demand will rise in California to support E15 use (IHS, 2011, p. 60). The study does not appear to consider the impact of renewed tariffs, of delayed or altered implementation of California's greenhouse gas standards, or of improvements in corn ethanol production to meet those standards. The California standards have been challenged in the courts. The outlook for ethanol at POWS is therefore less certain than if these issues had been addressed.

Significance – Medium:

Although biofuel imports account for 50% of the project benefits, the comment addresses the certainty of outcomes rather than the outcomes themselves.

Recommendation(s) for Resolution:

1. Verify the current status of the California greenhouse gas regulations and of the legal challenge.
2. Investigate efforts made by the domestic corn ethanol industry to meet the California greenhouse gas standards.
3. Verify the current status of ethanol import tariffs and of efforts to either renew those tariffs or allow them to expire.
4. Address the results of Recommendations 1 through 3 in an expanded sensitivity analysis of the ethanol forecast.

USACE Final Evaluator Response (#4)

Concur: We agree that this is an important and significant source of uncertainty. We included a sensitivity analysis with a scenario of limited ethanol imports, but agree that tying the scenario analysis and forecasts more directly to these two important issues – CA's evolving regulations and national tariffs on ethanol imports.

1. Adopt.
2. Adopt.
3. Adopt.
4. Adopt.

Final BackCheck (#4)

Concur.

Literature Cited:

IHS (2011). Commodity Forecasts and Competitive Market Analysis for the Ports of West Sacramento, Stockton, and Redwood City, IHS Global Insight, 2011.

Comment 5

Neither the Limited Reevaluation Report (LRR) nor the SEIS/SEIR quantitatively analyzes the potential for larger vessels, or vessels with larger loads, to increase shoreline erosion under the proposed project.

Basis for Comment:

Vessel-induced erosion is noted in the SEIS/SEIR as a concern associated with the project due to the larger vessels that will be used. However, project documentation does not address the potential that larger wakes created by larger vessels and vessels with larger loads could increase shoreline erosion under the proposed project. This potential impact warrants a quantitative analysis that should be included as part of the project documentation.

Significance – Medium:

Shoreline erosion could potentially be a significant issue, affecting project costs, sustainability, and water quality impacts.

Recommendation(s) for Resolution:

1. Estimate the size and frequency of wakes generated by the vessels that are expected to be used under the proposed project, and compare those estimates to current project data.
2. Translate the size and frequency of these wakes into potential erosion rates for all alternatives. Use historical data to ground-truth the erosion rates under the current project.
3. Provide a narrative description of the results for all alternatives.

USACE Final Evaluator Response (#5)**Concur****Recommendation 1 – Adopt****Recommendation 2 – Adopt****Recommendation 3 – Adopt**

The PDT has subsequently analyzed the wave generated erosion effects on the channel structure based on the larger vessels that were used in the two Ship Simulation Studies that were conducted in 2009 and 2010. The following results of the analysis are captured in a Memorandum for the Record:

1. There is no increase in wave induced shear stress that would propagate erosion.
2. No additional armoring of side slopes or bank areas is indicated over and above what already exists in the project. The Sacramento District will continue to monitor and maintain the channel structure after the deepening project is completed.

A copy of the analysis can be provided upon request.

Final BackCheck (#5)

Concur.

Comment 6

The potential impacts of a deeper Stockton channel on the economic analysis do not appear to be addressed in the NED analysis or the IHS study.

Basis for Comment:

Parallel efforts to deepen the Stockton ship channel could alter the relative competitive positions of the Ports of Stockton and West Sacramento from those indicated in the NED analysis and IHS report (IHS, 2011). This altered competitive position could affect the outlook for fertilizer (anhydrous ammonia and urea) and cement commodities.

Significance – Medium:

Additional details on potential competitive impacts of deepening the Stockton channel would address sources of uncertainty rather than the benefits estimates themselves.

Recommendation for Resolution:

1. Determine how deepening of the Stockton channel would affect the analysis of relative costs for the two ports and the forecasts for affected commodities.

USACE Final Evaluator Response (#6)

Non-Concur: We don't agree that the potential deepening wasn't considered, but we do agree that the report should include additional documentation of the rationale for not quantitatively including the consideration of the potential deepening of the channel to the Port of Stockton. The assumption used in the NED Analysis is consistent with the overall feasibility report, that the most likely future condition is a 35' Stockton ship channel. Perhaps more importantly though, both commodities mentioned have a history of moving through the POWS in spite of the current difference in channel depth. Urea and ammonia in particular have a relatively long and consistent history of moving through the Port of West Sacramento. We believe that the factors that have led to a demand for cement to move through the POWS will persist if the Port of Stockton regains a depth advantage of five feet at some point in the future.

1. Adopt. While we believe the issue has been considered in the analysis, we will discuss this issue again with the shippers during the next round of interviews that we need to conduct. We will include additional description of this issue and the findings of our interviews in our updated report.

Final BackCheck (#6)

Concur.

Comment 7

The analysis of port competition has not addressed the potential impact of reduced fees at the Port of Stockton.

Basis for Comment:

The discussion of competition between the Port of Stockton and the POWS (p. 25) notes the significance of higher port fees at Stockton and acknowledges that such fees are sometimes negotiated, but does not address the potential impact of lower fees. Port fees are frequently negotiated and are a major tool in port competition. The Port of Stockton is likely to negotiate lower fees rather than lose the business to POWS.

Significance – Medium:

The assessment of port competition and the forecasts of commodity flows are incomplete without an analysis of the effects of reduced Stockton port fees.

Recommendation(s) for Resolution:

1. At a minimum, examine the sensitivity of the commodity forecasts to assumptions regarding Stockton port fees and incorporate the results in an expanded sensitivity analysis section.
2. Depending on the outcome of the sensitivity analysis, revise the commodity forecast to assume that the Port of Stockton will protect its own best interests with regard to Port fees and cargo volumes.

USACE Final Evaluator Response (#7)

Concur: It is true that the analysis does not address the potential impact of reduced fees at the Port of Stockton. Both ports will continue to port fees as a tool for attracting or retaining business. There is no real way of knowing how these fees will evolve over time for the commodities in question, and as such this factor was not included in the analysis. Also, the analysis does not anticipate much if any shift in throughput from the Port of Stockton to the Port of West Sacramento. For example, ethanol and scrap metal don't currently move through the Port of Stockton, and there are already two cement companies established at or near the Port of West Sacramento that don't have facilities at the Port of Stockton. None of the benefits in the report are associated with a transfer of throughput between the two ports. Finally, it is our understanding that all West Coast ports are under the jurisdiction of the Pacific Coast Longshore Contract, which means that the labor costs per unit are equivalent. It is our understanding that this is the largest component of port fees.

1. Adopt. We will investigate the feasibility of conducting a sensitivity analysis using the IHS forecasting models.

2. Adopt. If adjusting the models is found to be feasible, and if the results are sensitive to changes in port fees, we will adjust the commodity forecasts as appropriate.

Final BackCheck (#7)

Concur

Comment 8

The vessel cost and transportation savings analysis appears to assume that (1) port fees are the same for all vessels, independent of their size and load, and (2) at-sea cost for a given vessel size is independent of payload. These assumptions increase the estimated benefits of using larger vessels and of loading vessels to greater Finals.

Basis for Comment:

Addendum 2 (Table 49) of the NED analysis displays sample calculations for vessel costs. The entries for port fees are the same for all vessel sizes. Port fees traditionally include “dockage,” which is assessed on the basis of vessel length, and “wharfage,” which is assessed based on the tonnage or volume of cargo. Port fees would thus ordinarily increase with the size of the vessel and its payload. Using the same port fees for all vessels and payloads reduces the average port fee per ton for larger vessels and loads, thereby increasing the estimates of transportation cost savings of deeper Finals.

Addendum 3 (Table 50) of the NED analysis gives sample calculations of the transportation cost savings from deeper Finals and greater payloads (e.g., less light-loading). Those calculations use the at-sea cost (and the port fees) of the fully loaded vessel from Table 49 and divide those costs by the lower light-loaded payloads to get a higher cost per ton. The calculations implicitly assume that the at-sea cost (and the port fees) of the light-loaded vessel is the same as the fully loaded vessel. However, to the extent that at-sea cost (e.g., fuel consumption) is affected by loaded vessel displacement, the cost of the light-loaded vessel should be less.

Significance – Medium:

Vessel cost assumptions directly affect the net benefits estimates.

Recommendation(s) for Resolution:

1. Verify the basis and amount of port fees for POWS, competing ports, and origin ports for the range of vessel sizes and payloads in the analysis, and make appropriate adjustments to the cost estimates.
2. Justify the assumption that the at-sea costs will be the same for a light-loaded vessel as for a fully loaded vessel, or make appropriate adjustments to the cost estimates.

USACE Final Evaluator Response (#8)

Concur: On the issue of port fees, we agree that the data should be revisited and verified with the Port and our other sources. On the issue of at-sea costs being independent of payload, we agree that this is a limitation of the analysis but have learned that the data does not yet exist to enable the analysis to be improved in this area. We contacted Ian Mathis at IWR to help us address this comment since the vessel operating cost data comes directly from IWR. He stated that it is a recognized limit of the operating cost data, and that IWR is currently working with a group of naval architects to develop functions for fuel consumption and associated costs according to both speed and immersion respective to vessel type and size class. IWR hopes to include the refined data in next year’s edition of vessel operating cost data.

1. Adopt.

2. Adopt. The justification for the assumption (no data yet exists) will be added to the report.

Final BackCheck (#8)

Concur.

Comment 9

The NED analysis assumes that cement imports will come from Asia, but sourcing from Mexico could result in fewer net project benefits.

Basis for Comment:

The estimated transportation cost savings for cement are a function of voyage length. While past cement imports have come primarily from Asia as indicated in the NED analysis (Table 32, p. 58), port developments on the west coast of Mexico have reportedly enabled (or will shortly enable) competitive cement exports from Mexico. Cemex, the operator of the new POWS cement import facility, is a Mexican firm with production capacity in Mexico. If Cemex or the other POWS importer chooses to source cement from Mexico rather than from Asia, voyage lengths and transportation costs would be significantly reduced from those anticipated in the analysis, and project transportation cost savings that depend on long voyages would be less.

Significance – Medium:

The assumption that cement imports will come from Asia rather than Mexico or other sources directly affects the estimate of net benefits.

Recommendation(s) for Resolution:

1. Contact cement importer representatives to verify the expected origins of cement imports to POWS.
2. Correct transportation cost savings estimates as required.

USACE Final Evaluator Response (#9)

Concur: We agree that this assumption should be revisited.

1. Adopt.
2. Adopt.

Final BackCheck (#9)

Concur.

Comment 10

The discussion of beneficial uses of dredged material does not provide a comprehensive range of alternatives for such uses and does not describe how this objective will be met.

Basis for Comment:

The Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report (SEIS/SEIR) (Appendix H) provides a good description of potential construction uses of dredged material and states that a large number of construction and materials companies in the area were surveyed to determine which might use this sediment. However, this discussion does not extend beyond consideration of uses such as levee-building and structural fill, although construction uses are predicted to account for only half of the materials to be dredged. Alternative uses such as habitat restoration or creation are not addressed, but could produce environmental benefits in the project area.

Beneficial use screening criteria are generally comprehensive, but alternative disposal site evaluations are not accurate in some cases. Alternative stockpiling disposal sites are well-described, but screening of all sites should consider input from end users, whether these are construction companies or organizations engaged in habitat restoration. For example, the Montezuma Wetlands, LLC restoration site was excluded from consideration due to an incorrect assumption that hydraulic dredged material could not be accommodated at that site.

Significance – Medium:

Additional assessment of alternative uses will provide a more defensible basis for the determination that beneficial uses have been incorporated in the project to the fullest practicable extent.

Recommendation(s) for Resolution:

1. Expand Appendix H to incorporate additional alternative uses, including a more thorough discussion of alternative habitat restoration or creation sites.
2. Provide a more comprehensive review of entities that are potential non-construction users of dredged material.

USACE Final Evaluator Response (#10)**Concur****Recommendation 1 – Adopt****Recommendation 2 – Adopt**

The PDT has made considerable progress in addressing the issue of beneficial use since the Final SEIS/R was circulated.:

1. A Dredged Material management Plan (DMMP) is being developed, portions of which will be incorporated into Appendix H. Multiple beneficial use sites are proposed, including Montezuma Wetlands.

The PDT has canvassed potential users of the deepening and future maintenance material and has been working closely with the NFS to further develop a long term sustainable facility that will be maximizing the beneficial use of dredged material. Several of the beneficial use sites will be operating as “pug mills” to provide manufactured soils to be

used for flood control levee construction and repairs. The PDT will be updating Appendix H to reflect the current plan for final disposition of the deepening dredged material as well as future O&M material after the deepening has been completed. A copy of the Final DMMP can be made available upon request.

Final BackCheck (#10)

Concur. The panel has not seen the revisions that the Evaluator comments indicate will be made to address the panel's Final Comments. The panel's response of "Concur" is provided assuming that the revisions are made as indicated.

Comment 11

The cumulative impacts do not fully address the potential salinity effects of construction of the Sacramento River Deep Water Ship Channel (SRDWSC) and the San Francisco Bay to Stockton Deep Water Ship Channel (DWSC).

Basis for Comment:

The combined salinity effects of deepening both DWSCs meet the National Environmental Policy Act (NEPA) (40 CFR § 1508.7) and California Environmental Quality Act (CEQA) (CCR Section 15355) definitions of cumulative effects. However, the cumulative impacts of deepening both DWSCs are not addressed in SEIS/SEIR Section 4.5.2, Summary of Cumulative Effects Identified.

Appendix L demonstrates that the salinity effects on the X2 distance and environmental and water supply metrics caused by deepening the SRDWSC are increased when the San Francisco Bay to Stockton DWSC is also deepened. The water quality objectives for municipal and industrial, agricultural, and fish and wildlife habitat beneficial water supply uses are violated (or are more frequently or more severely violated) when both DWSCs are deepened relative to deepening only the SRDWSC or implementing the no action alternative. These impacts are described in Sections 5.7.1, 5.7.2, and 5.7.3 of Appendix L. As an example, Figure 5.7-25 (p. 610) of Appendix L shows that a water quality objective (EC levels during the period from October through April) for agricultural water supply beneficial use is not met to a greater extent by deepening both DWSCs.

Significance – Medium:

Because the cumulative impacts of deepening both DWSCs are not described, the SEIS/SEIR does not satisfy NEPA or CEQA requirements for addressing cumulative impacts.

Recommendation for Resolution:

1. Utilize the information contained in Appendix L to provide a comprehensive description of the cumulative impacts of deepening the Sacramento River and San Francisco Bay to Stockton DWSCs in terms of environmental and water supply metrics.

USACE Final Evaluator Response (#11)

Concur – not adopt. The project's consideration of the Stockton project has changed. Because of the possible impacts of the Stockton deepening, the project is considering alternate depths to minimize salinity intrusion. Lack of funding to pursue this and the required modeling has put the project on hold. Appendix L will be revised and not include details of the Stockton project. The cumulative effects of this project will be considered in revised documents in a qualitative way as there is no current way to provide quantitative estimates. When funding for further study of the Stockton project is available, modeling will be done with new depths. It is further understood that the proposed deepening of SRDWSC may impose some constraints on the Stockton project in terms of salinity.

Final BackCheck (#11)

Concur.

Comment 12

The assumption underlying the salinity modeling and determination of the X2 distance analysis and the types and levels of impacts does not thoroughly document a determination of no significant adverse impact.

Basis for Comment:

The SEIS/SEIR concludes there is no significant impact of project induced changes in the X2 distance based on the minimal change in the median increase in the X2 distance based on the worst-case scenario of sea level rise. The Panel believes that two aspects of the evaluation of impacts to the X2 distance should be addressed more thoroughly: the impacts on the X2 distance if future sea level rise is less than 2 feet and the impacts on changes in the X2 distance in terms of water supply and environmental impacts.

It is not clear how the impact on the X2 distance would change if the rise in sea level was less than the assumed 2 feet. Comparison of the graphs in Appendix L showing the cumulative numbers of days with changes in the X2 distance for year 0 (representing no sea level rise) and year 50 (representing a 2-foot sea level rise) indicates that higher sea levels reduce the impact of channel deepening for the SRDWSC deepening alone and for deepening of both the SRDWSC and the San Francisco Bay to Stockton DWSC. Once the channel is deepened, salinity increases should be immediate and uninfluenced by sea level rise, while the significance of the worst-case sea level rise on X2 would not be experienced until year 50. The SEIS/SEIR lacks descriptions of the relative impacts of channel deepening vs. sea level rise on the X2 distance.

Section 3.1.2.4 concludes that there is no significant impact to the X2 distance because the median change in X2 is only 0.11 kilometer (km) in year 0 and 0.17 km in year 50. However, Figure 5.3-16 in Appendix L shows that with deepening of the SRDWSC alone, there are 100 days in the year when the shift in the X2 distance is about 0.3 km and 10 days when the X2 shift is about 0.8 km. These shifts are more than doubled as a result of deepening both the SRDWSC and the San Francisco Bay to Stockton DWSC.

Appendix L describes how channel deepening would impact environmental and water supply objectives. Many of the environmental objectives are seasonal. The SEIS/SEIR does not address the impacts of temporal changes in the X2 distance or salinity levels. The significance of environmental impacts cannot be determined simply on the basis of the change in X2 distance; the seasonality of changes in relation to habitat requirements of affected species must also be considered.

The UnTRIM modeling was based on the assumption that the water agencies operate in accordance with guidelines in the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) biological opinions and the Water Rights Decision 1641. As described in Appendix L, these guidelines require the water agencies to mitigate undesirable shifts in the X2 distance. The water agencies are required to either reduce withdrawals or increase discharges to push the X2 distance back. The SEIS/SEIR does not describe the impacts on the water agencies that result from the increased requirement to mitigate X2 distances that would occur with channel deepening. These

impacts should be described to indicate whether they cause financial impacts, water supply shortages, etc. In its comments on the SEIS/SEIR, the California Department of Water Resources indicated that movement of the X2 distance by only 0.1 km could result in additional discharges of water that could result in up to a \$5 million annual cost.

Significance – Medium:

The conclusion in the SEIS/SEIR of no significant impact of changes in the X2 distance cannot be supported without addressing the impacts in terms of environmental and water supply impacts.

Recommendation(s) for Resolution:

1. Evaluate how the alternatives would impact X2 distances based on the assumption of a 2-foot sea level rise vs. a smaller sea level rise.
2. Present the results of an evaluation of temporal changes in the X2 distance on the delta smelt and other potentially impacted aquatic species.
3. Present the results of an evaluation of impacts of changes in the X2 distance on water supply availability and/or additional costs incurred by water agencies.

USACE Final Evaluator Response (#12)

Concur.

Recommendation 1 – Adopt: Additional salinity modeling efforts have been conducted to evaluate Year 50 with an intermediate 30 cm sea level rise. This has been incorporated into the *Sacramento DWSC 3-D Hydrodynamic and Salinity Modeling Study – Sacramento River Deep Water Ship Channel Deepening Scenario Report* Prepared July 31, 2011. The multi-scenario sea level rise analysis is described in Section 3.2.2 and 3.2.3 of the text. Also, Appendix A is presents results to the 30 cm SLR scenario.

Recommendation 2 - Adopt: Evaluation of temporal changes in the X2 distance on the delta smelt and other potentially impacted aquatic species is further evaluated with additional description of changes to the low salinity zone with and without channel deepening. This analysis is described in Appendix C of the aforementioned text.

Recommendation 3 - Adopt: Additional analysis has been conducted to evaluate of impacts of changes in the X2 distance on water supply availability by computing the annual volume of water releases necessary to offset water quality impacts resulting from channel deepening. This analysis is described in Section 6.0 of the previously mentioned text.

Final BackCheck (#12)

Concur. The panel has not seen the revisions that the Evaluator comments indicate will be made to address the panel’s Final Comments. The panel’s response of “Concur” is provided assuming that the revisions are made as indicated.

Comment 13

Several environmental mitigation measures are not sufficiently documented and justified to support a conclusion that an identified significant adverse impact would be avoidable.

Basis for Comment:

Measures that have the potential to mitigate for various adverse environmental impacts are identified throughout the document. However, additional documentation is needed to support the conclusion that impacts would be less than significant as a result of mitigation in the following cases:

- Water quality impacts from release of methylmercury in dredge disposal site return water are proposed to be mitigated through measures such as centrifuging return water or impounding dredge water to preclude discharge, but the practicability of these approaches is not documented.
- Avoidance of mechanical damage to special-status or protected bottom-feeding fish such as green sturgeon includes maneuvering of the dredge cutterhead, but no information is provided to show that this mitigative measure is practicable.
- Compensatory mitigation for loss of 1.33 acres of high-quality wetlands is proposed to consist of preservation of 1.33 acres of existing wetlands, although this level of mitigation is not shown to balance the loss of wetland functional value. The USFWS Region 8 has a goal of no net loss of acreage, but Table 6 in Appendix D cites “no net loss of in-kind habitat value or acreage.”
- Air emissions from construction equipment are described as a potentially significant adverse impact. Proposed mitigation includes mechanical modifications to off-road equipment, to arrive at a conclusion of a less than significant impact; however, no description of the effectiveness of such modifications is provided.
- Approval has been sought for a 6-month construction period, but such an extension could interfere with nesting of certain bird species in disposal sites. Mitigation for this impact is described as including surveys of nesting activity to avoid nesting birds, but mitigation may also need to include delay of disposal site use.

Significance – Medium:

Conclusion statements regarding potentially significant adverse impacts must be documented, in compliance with Council on Environmental Quality (CEQ) guidelines. Data or other supporting information are necessary to support statements that proposed mitigation measures would be practicable and would mitigate adequately for acknowledged impacts.

Recommendation(s) for Resolution:

1. Provide results of any studies or observations of dredge water centrifugation or other techniques for removing methylmercury from return water
2. Provide documentation that dredge cutterhead maneuvering is effective in avoiding physical damage to bottom-feeding fish such as the threatened green sturgeon.
3. Provide habitat quality comparisons of wetlands that would be impacted vs. proposed preservation wetlands, to support the conclusion that acre-for-acre preservation adequately satisfies the federal government’s goal of no net loss of habitat value.
4. Provide documentation of demonstrated effectiveness of mechanical modifications to off-road construction equipment, to reduce air emissions to a degree that air emissions would not violate air quality criteria.
5. Clarify the extent to which a 6-month construction period would overlap with nesting of protected bird species in proposed disposal sites.

USACE Final Evaluator Response (#13)

Concur: Many of the mitigation features are not adequately detailed.

1. Adopt
2. Adopt
3. Adopt
4. Adopt
5. Adopt

The next Final SEIS/R will include the following changes. MeHg release will not be subject to regulation, though will be closely monitored based upon verbal agreement with the WaterBoard (to be corroborated in permits at a later time). Wetland mitigation will be revised and be in accordance with FWS FWCA CAR. The Air Quality section will be redone and provide appropriate information. The construction windows and overlap with protected bird species will be properly analyzed and described in future Finals. Future document Finals will address the potential for impact on green sturgeon of the cutterhead.

Final BackCheck (#13)

Concur. The panel has not seen the revisions that the Evaluator comments indicate will be made to address the panel’s Final Comments. The panel’s response of “Concur” is provided assuming that the revisions are made as indicated.

Comment 14

Methylmercury could be an issue; however, the data presented are not conclusive, thereby resulting in uncertainty about the potential impacts of the proposed project's disposal plan.

Basis for Comment:

Mercury concentration in dredged material elutriates studied in 2009 exceeded the Waste Discharge Requirement at 12 of 44 sites in the existing channel (Table 35). As described in Section 3.1.3.1, exceedances in elutriates and bulk sediments were also reported during sediment testing in 2001 through 2003 and 2005 through 2007 (Table 26), but specific concentrations were not cited in the discussion of water quality impacts in Section 3.1.4.1.7. Because the maximum concentration observed in 2009 was below earlier sediment elutriate analyses (2001 through 2003 and 2005 through 2007), it was concluded that exceedances observed in 2009 would not have a significant adverse effect on water quality. However, the potential for methylation of mercury in dredged material resuspensions (in disposal sites) is not well-understood and results of ongoing studies of this process are not yet available. A 2009 study of methylation of mercury during maintenance dredging in the existing channel showed increased levels of methylmercury in disposal site waters, but results could not be compared to background conditions. Methylmercury is readily bioaccumulated and can be toxic to aquatic organisms. Bulk sediment analyses are described in Section 3.1.3.1.1 and included methylmercury; however, Table 27 does not include those data.

Significance – Medium:

Pending an evaluation of the results of ongoing methylmercury studies, it is difficult to assess the level of impact associated with mercury concentrations observed in sediment elutriates.

Recommendation(s) for Resolution:

1. Incorporate results of ongoing studies of methylation of mercury in the assessment of dredged material disposal effects on water quality.
2. Clarify the discussion of mercury exceedances in 2001 through 2003, 2005 through 2007, and 2009 channel sediment and elutriate chemistry studies.

USACE Final Evaluator Response (#14)

Concur. The section on methylmercury result in uncertainty about impacts. The project has funded two demonstration projects examining possible best management practices for dredged material placement areas and the potential for methylation.

1. Adopt
2. Adopt

Results of one will be included in the next iteration of the SEIS/R, results of the second one probably will be included in a future version of the SEIS/R. The

Central Valley Water Board collaborated in the development of these two demonstration projects and will not probably not set specific quantitative limits on MeHg discharge, rather they will present best management practices (i.e., removing vegetation from the placement area) and require monitoring and further demonstration projects to collect data for an upcoming TMDL on MeHg. Both recommendations will be taken – we will incorporate results of ongoing studies in environmental documents and also clarify the discussion of mercury exceedences.

Final BackCheck (#14)

Concur

Comment 15

The validity of the proposed 6-month construction work window does not support a conclusion that it could be used without causing harm to endangered species.

Basis for Comment:

Department of Interior stated in the public comments section of the SEIS/SEIR a concern regarding the acceptability of a 6-month work window. The SEIS/SEIR states that the proposed 6-month work window will be evaluated during Endangered Species Act (ESA) Section 7 consultation. Additionally, in its public comments on the SEIS/SEIR, the Coalition for a Sustainable Delta indicated that “The most recent report of the Interagency Ecological Program that addresses the pelagic organism decline in the Delta documents that delta smelt are consistently caught in the SRDWSC during the period proposed for dredging activities (IEP 2010).”

Historically, a 4-month work window has been deemed protective of endangered species through ESA coordination required for maintenance dredging of the SRDWSC. This indicates that a 4-month work window for channel deepening might also be appropriate. The SEIS/SEIR only describes impacts on the duration of construction associated with a 6-month work window vs. the 4-month window. There is no explanation of why a 6-month work window could be utilize without causing harm to endangered species.

Significance – Medium:

If a 6-month work window is not adequately protective of endangered species and a 4-month work window is required, the total construction duration of the project will increase from 4 to 6 years.

Recommendation for Resolution:

1. Initiate Section 7 consultation with the USFWS and NMFS to arrive at an acceptable work window.

USACE Final Evaluator Response (#15)

Concur. The concerns about limited work windows are justified.

1. Adopt

The project is no longer proposing 6-month work windows for the entire area to be dredged, we are discussing windows with USFWS/NMFS/CADFG, and will formally initiate mitigation soon. The windows that are under discussion developed in order to minimize possible adverse effects are from June 1 through November 30 in reaches 1, 2, and 3; and from August 1 through November 30 in reaches 4 and 5.

Final BackCheck (#15)

Concur.

Comment 16

The number or locations of pipelines that must be relocated, or the potential environmental impacts of pipeline relocation, have not been described in detail.

Basis for Comment:

The SEIS/SEIR describes a relocation plan (p. 436 and Figure 36a) for pipelines that cross under the existing channel at depths too shallow to provide a margin of safety for dredging (apparently less than 6 feet below the proposed channel depth). The SEIS/SEIR identifies two such pipelines that may need to be relocated. However, more recent assessment of project area pipelines indicates that as many as five pipelines would be moved (generally, relocated at greater depths below the channel bottom). Without a full and accurate assessment of this issue, it is not possible to address fully the potential for environmental impacts of pipeline relocation. Section 3.3.11 discusses the results of hazardous, toxic, and radioactive waste (HTRW) surveys of the channel area, and concludes that no HTRW sites would be affected by relocating pipelines. However, no evaluation is presented on the relocation sites or methods of relocation, or the effects of the relocation on sediment quality, water quality, or terrestrial habitats.

Significance – Low:

Updating information regarding required pipeline relocations would enhance the credibility of the document. Clarification of relocation methods would allow a more-thorough assessment of environmental impacts.

Recommendation(s) for Resolution:

1. Provide a final determination of the number and locations of pipelines to be relocated.
2. Evaluate aquatic and terrestrial resources at relocation sites and describe potential impacts of relocation methods on those resources.

USACE Final Evaluator Response (#16)

Concur. The pipeline details and effects are not discussed in adequate detail.

1. Adopt
2. Adopt

The next Final SEIS/R will provide a final determination of the number and locations of pipelines, describe habitat resources with the potential to be affected, potential effects.

Final BackCheck (#16)

Concur.

Comment 17

The documentation was unclear regarding the need for, and the location and extent of, proposed channel widening.

Basis for Comment:

The documentation does not clearly explain why channel widening is being considered in the Alternative Formulation Briefing (AFB) read-ahead report or the SEIS/SEIR. A compelling explanation of the need for and the extent of widening should be included in both documents. The general location of widening is described in the report graphics, but there is no text explaining the extent of the proposed selective widening.

The AFB report includes channel-widening as a management measure, but it is included in all the channel-deepening alternatives. There is no discussion explaining why channel widening is not considered as a stand-alone alternative or why channel widening is a component of all alternatives.

Significance – Low:

Without a description of the need for channel widening, it is not clear how the plan formulation process arrived at the set of alternative plans that were evaluated.

Recommendation(s) for Resolution:

1. Describe why channel widening is necessary.
2. Explain why channel widening is a management measure but is not considered as a stand-alone alternative.
3. Explain why channel widening is included in all deepening alternatives.
4. Provide a narrative description of the extent of the selective channel widening included in the alternatives.

USACE Final Evaluator Response (#17)

Concur.

Recommendation 1 - Adopt. The San Francisco Bar Pilots were consulted by the PDT to ascertain the size of the largest vessels that are currently being operated to and from the Port of West Sacramento. The Bar Pilots informed the PDT that the largest of the vessels is approximately 771-ft LOA. This vessel is considerably larger than the design vessel that was used in the Ship Simulation Study of 1990.

Recommendations 2 and 3 - Adopt. The Bar Pilots requested that a new Ship Simulation Study be conducted to demonstrate that these larger vessels warrant an increase in channel width at various locations in the project. A Ship Simulation Study was conducted in 2009 for reaches 1 through 4, and a supplemental Ship Simulation Study was conducted in 2010 for reach 5. The results for both studies confirmed that additional widening was indicated at specific locations to provide safe operation regardless of the depth of the channel. This increase in safety measures in turn leads to an increase in schedule efficiency. The USACE design vessel identified in the Ship Simulation Studies was the basis for the findings of the economic analysis, forecasted

fleet mix, and in accordance with USACE design standards and guidelines (Reference EM #). The design vessel dimensions (draft, width, etc.) and channel design dimensions for navigation and safety tolerances are specified in the above EM.

A Channel Widening Only alternative could be added as a preliminary alternative.

However, this alternative only meets one of the two defined project purposes (provide safe navigation), but not the other (to realize increased economic benefits). Therefore, it would be screened out from the final alternatives. Conversely, a Channel Deepening Only alternative could be also be added as a preliminary alternative. This alternative would be eliminated for the opposite reason. It would help realize increased economic benefits, but not provide safe navigation. These preliminary alternatives are similar to other alternatives that were considered but eliminated such as Intermodal Transportation, LASH, and Locks.

Recommendation 4 - Adopt. The revised draft SEIS/EIR will include tables that provide the locations and extent of the channel widening recommended by the Ship Simulation studies, as well as drawings of the entire channel with detailed dimensional information.

Final BackCheck (#17)

Concur.

Comment 18

The document does not clearly state why a LRR was appropriate rather than a General Reevaluation Report (GRR), given the significant changes that have occurred since authorization.

Basis for Comment:

Deepening the SRDWSC to 35 feet was authorized in 1985. The SEIS/SEIR states that in 1998, Congress directed preparation of a LRR. However, as stated in the LRR AFB Report, Congress directed USACE to "...complete a reevaluation report ...". Such a reevaluation could be documented in either a LRR or a GRR. A GRR is appropriate when conditions and/or assumptions have changed since authorization.

Since the 1985 authorization of the SRCWSC deepening, several events have occurred that could change conditions and assumptions for planning. Critical habitat has been designated for at least five fish species that include all or parts of the SRDWSC, including the delta smelt. The 1995 Bay Delta Agreement stipulates operations by the water agencies based on the X2 line, which is impacted by the proposed project. Because of these substantial changes in factors that must be considered in plan formulation, it is not clear why an LRR is an appropriate document rather than a GRR.

Significance – Low:

The AFB Report does not clearly make a compelling case for why a LRR is an appropriate document for this reevaluation.

Recommendation(s) for Resolution:

1. Provide a chronology of authorizations, planning and engineering documentation, and construction for the SRDWSC to provide the reader with a better understanding of conditions that led to the 1998 authorization of a reevaluation. Note: all the required information is currently in the report, but it needs to be integrated into a concise chronology.
2. Describe changes that have occurred that affect the "planning environment" since the 1985 authorization.
3. Explain why the changes in the planning environment can be addressed in a LRR.

USACE Final Evaluator Response (#18)

Concur: This current post-authorization decision document has been prepared as a Limited Reevaluation Report (LRR). The purpose of this LRR is to reaffirm if there is continued Federal interest in reinitiating and completing construction of the already authorized project. Two of the six construction contracts (from River Mile 43.3 to 35.5) were completed in the late 1980's. The deeper channel would increase safety, navigational efficiency, and enable economic benefits associated with the reduced cost of transportation. Due to the scope of the LRR; a reformulation of the authorized project is not planned. The intent of the LRR is to confirm the rationale and economic justification to complete the remaining portions of the authorized project in accordance with current environmental compliance requirements. The intent, purpose and scope of this LRR are

to validate the implementation and completion of the authorized project. It is not carrying out a reformulation, expansion or extension of the authorized project. An authority analysis and legal opinion was prepared and concluded that the The Chief of Engineers has the authority to approve the LRR and resume construction of the Project. The Chief of Engineers may approve the LRR, because the report's recommended changes are within the discretionary authority that Congress delegated to the Chief of Engineers in Section 202 of the Water Resources Development Act of 1986. The authority analysis determined that the existing project authorization is sufficient to implement LRR's proposed plan to complete construction of the remaining reaches of the authorized project without the need to seek additional or new Congressional authorization. In addition, the LRR's proposed plan meets all of the standards of ER-1105-2-100 (PGN) for approval by the SPD Commander and is consistent with legislation subsequent to the original authorization. Although the vertical team previously decided that HQUSACE approval under the Chief of Engineers discretionary authority was appropriate for the project, the HQUSACE RIT may determine in the future that project approval be delegated to the SPD Commander. Note- reference Authority-Scope Analysis dated 3/2011 and Legal Opinion dated 4/11/2011 for additional related information regarding project authorization.

Further, the scope and purpose of the LRR meets the conditions to be carried out under the existing LCA as provided by the ASA(CW) Memorandum, dated 8/18/2004, subject Development of Specifically Authorized Projects and Separable Elements. As such this LRR is comparable to other requirements and activities needed to implement the authorized project that are being carried out under the existing LCA (e.g., design of the authorized project, MCACES, real estate gross appraisal, environmental compliance, (BA/BO) coordination, permitting, etc.).

1. Adopt.
2. Adopt.
3. Adopt.

Final BackCheck (#18)

Concur.

Comment 19

The descriptions of the benthic or planktonic communities do not include enough detail to characterize these aquatic resources in the project area.

Basis for Comment:

The document cites two previous studies or reports (2009 and 2010) concerning invasive benthic communities in the project area but provides no details of background species composition of benthic assemblages or pollution tolerance of benthos in the existing channel. Comparisons of benthic communities in the previously deepened channel segment, the channel to be deepened, and appropriate reference habitats would provide documentation needed to conclude that deepening would not have a significant adverse impact on benthic organisms.

The discussion of planktonic organisms is based on a study of plankton in the channel area, but does not describe species composition of either phyto- or zooplankton in the existing shipping channel. As a result, there are no data to describe the presence/absence of harmful algal bloom species (HABS) or potential effects of modest salinity increases on planktonic community composition (although such impacts are expected to be minor).

Significance – Low:

Site-specific information on benthic and planktonic organisms would enhance the description of the existing environment, although this information is not considered to be essential in identifying aquatic biology impacts of the project.

Recommendation(s) for Resolution:

1. Present species-level benthic and planktonic community information in Section 3.2.1.1.2 (Aquatic organisms).
2. Provide documentation of pollution-tolerant species occurrences and/or abundance in benthic and water column habitats.
3. Identify and summarize additional studies and publications that describe benthic and planktonic habitats and communities in the existing channel or in the immediate vicinity (if any).

USACE Final Evaluator Response (#19)

Concur

Recommendation 1 – Adopt

Recommendation 2 – Non-adopt

Recommendation 3 – Adopt

The descriptions of the benthic and planktonic communities are insufficiently detailed. The revised SEIS/R will contain more species level information and summarize additional studies and publications containing information thereon. We do not concur with the recommendation that we provide documentation of pollutiontolerant species as the proposed project will not increase levels to the extent that these species would be selected for or increase in abundance. We predict no change in overall species composition as a result of direct or indirect effects of the

project.

Final BackCheck (#19)

Concur.

Comment 20

The conclusion that groundwater will not be impacted due to the project is not supported by the information presented.

Basis for Comment:

The justification for concluding that groundwater will not be impacted is based upon the fact that groundwater wells for potable water are “on the order of hundreds of feet deep due to the thickness of the overburden.” This is not adequate evidence that there would be no impact to groundwater as a result of channel deepening. Without additional information about the geology of the area and existing groundwater conditions, it is not possible to make definitive assessments about the ability of the overburden to prevent encroachment of additional saltwater.

Significance – Low:

While the Panel believes that the likelihood of groundwater contamination is minimal, the issue is sufficiently important to merit a more thorough technical examination.

Recommendation(s) for Resolution:

1. Provide basic geological and groundwater information for the area.
2. Complete a qualitative assessment of the potential for project-induced groundwater contamination for all alternatives.
3. Provide a narrative description of the potential for each alternative to impact groundwater quality.

USACE Final Evaluator Response (#20)

Concur

Recommendation 1 – Adopt

Recommendation 2 – Adopt

Recommendation 3 – Adopt

The Sacramento Deep Water Ship Channel will be cut through very recent deposits. The natural elevation of the ground water table is generally at the same elevation as the river. Due to agricultural use the ground water is generally maintained a couple of feet below the ground surface by a series of pumps and ground water drainage ditches. Due to subsidence, most of the adjacent farm land is now significantly lower than the original natural grades, which has required additional pumping and lowering of the ground water table. This lowering of the interior ground water levels has created a gradient near the river, thus causing some infiltration, and possibly salt intrusion near the river channel. Infiltration as a result of the Sacramento Deep Water Ship Channel may be increased to some degree by the placement of dredge material, or as a result of permeable layer exposures in the deep water ship channel.

It is judged that DMP impacts will be local and minor for the following reasons.

1) Dredge material displacement sites may have some infiltration into the ground, however the groundwater quality beneath the placement sites is anticipated to be similar to the dredge material seepage. Additionally, the DMP infiltration is a one-time placement and will not continually be a source of seepage. Additionally, most of the water placed in the dredge material sites will be removed through a decanting and pumping process.

Deepening of the ship channel may expose higher permeability layers to direct contact to the river water. This has the potential to allow more infiltration into the adjacent lands, however the impacts are uncertain on ground water quality. Factors to consider when evaluating regional impacts include:

- 1) Due to the general depositional environment, identifying every permeable deposit along the river and it's general connectivity to other permeable zones where wells may exist is an impossibility.
- 2) The near surface soils are highly permeable in the downstream portions of the project, and infiltration is probably occurring into the shallow aquifer near the river already. Additionally, highly permeable layers have been exposed in upstream portions of the project already as well.
- 3) Numerous sand layers are already exposed which will not be affected by additional channel excavation, as the ground water gradients are not changing
- 4) Overall gradients are not changing as the river elevation will remain the same
- 5) The gradients within the interior areas are relatively flat, controlled predominantly by agricultural groundwater control. Flat gradients may limit the distance that groundwater infiltration may occur around the river.

Final BackCheck (#20)

Concur