SHORT-TERM ANALYSIS SERVICE (STAS)

on

Final Independent External Peer Review Report
San Clemente Storm Damage and Shoreline Protection Feasibility Study

by

Battelle
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for

Department of the Army
U.S. Army Corps of Engineers
Coastal Storm Damage Reduction Planning Center of Expertise
Los Angeles District

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The views, opinions, and/or findings contained in this report are those of the author and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.
FINAL
INDEPENDENT EXTERNAL PEER REVIEW REPORT
for the
San Clemente Storm Damage and Shoreline Protection
Feasibility Study

EXECUTIVE SUMMARY

The San Clemente Shoreline Feasibility Study area is located along the Pacific Ocean coastline in the City of San Clemente, Orange County, California. The beaches throughout this study area have historically suffered from beach erosion due to storm-induced wave attack, with greatest erosion occurring since the early 1990s. The “T-Street” region of the shoreline is a notoriously popular surfing site located immediately south of San Clemente pier, and directly offshore of the T-Street overpass. Running along the entire length of the San Clemente shoreline is a portion of the Lossan (Los Angeles to San Diego) railroad corridor, which is owned by the Orange County Transportation Authority. This commuter rail corridor is among the busiest in the country and separates the beach from the bluff.

The study area is divided into ten reaches based on locations of developments and the condition of the revetment that runs along the railroad tracks. After analysis of each section it was determined that only Reach 6 of the original ten reaches has the potential for a justified project based on economic analysis. Reach 6 extends from Paseo de Cristobal to Linda Lane in the City of San Clemente and contains beach ranging from 5 to 20 meters (16 to 66 feet) in width. The beaches are backed by park facilities, railroad tracks, and high coastal bluffs and include the majority of significant structures along the beach.

The purpose of the San Clemente Shoreline Feasibility Study is to identify the most technically feasible and economically beneficial “recommended plan” for reducing shoreline erosion and protecting coastal infrastructure from storm-induced wave attack. The U.S. Army Corps of Engineers (USACE) is conducting an Independent External Peer Review (IEPR) of the San Clemente Storm Damage and Shoreline Protection Feasibility Study (San Clemente Feasibility Study). Battelle, as a 501(c)(3) non-profit science and technology organization with experience in establishing and administering peer review panels for USACE, was engaged to coordinate the IEPR of the San Clemente Feasibility Study. Independent, objective peer review is regarded as a critical element in ensuring the reliability of scientific analyses. The IEPR was external to the agency and conducted following USACE and Office of Management and Budget (OMB) guidance described in USACE (2010), USACE (2007), and OMB (2004). This final report describes the IEPR process, describes the IEPR panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel (the Panel).

Five panel members were selected for the IEPR from more than 26 identified candidates. Based on the technical content of the San Clemente Feasibility Study and the overall scope of the project, the final panel members were selected for their technical expertise in the following key areas: coastal or civil design/construction cost engineering; civil works planning; the National...
The IEPR Panel received electronic versions of the San Clemente Feasibility Study documents, along with a charge that solicited the Panel’s comments on specific sections of the documents to be reviewed. The charge was prepared by Battelle to assist the USACE in the development of the charge questions that was to guide the peer review, according to guidance provided in USACE (2010) and OMB (2004). USACE was given the opportunity to provide comments, revisions, and subsequently approved the final charge questions. The San Clemente Feasibility Study Project Delivery Team from USACE briefed the Panel and Battelle during a kick-off meeting held via teleconference prior to the start of the review. Other than this teleconference, there was no direct communication between the Panel and USACE during the peer review process. The Panel produced more than 400 individual comments in response to 151 charge questions.

IEPR Panel members reviewed the San Clemente Feasibility Study documents individually. The panel members then met via teleconference with Battelle to review key technical comments, discuss charge questions for which there were conflicting responses, and reach agreement on the Final Panel Comments to be provided to USACE. Each Final Panel Comment was documented using the following four-part format: (1) a comment statement; (2) the basis for the comment; (3) the significance of the comment (high, medium, or low); and (4) recommendations on how to resolve the comment. Overall, 24 Final Panel Comments were identified and documented. Of these, 8 were identified as having high significance, 13 had medium significance, and 3 had low significance.

Table ES-1 summarizes the Final Panel Comments by level of significance. Detailed information on each comment is contained in Appendix A of this report.

**Table ES-1. Overview of 24 Final Panel Comments Identified by the San Clemente Feasibility Study IEPR Panel**

<table>
<thead>
<tr>
<th>Significance</th>
<th>Comment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>1 The assumption that the existing beach is erosional is not supported by the data and analyses used to develop representative Future without Project conditions.</td>
</tr>
<tr>
<td></td>
<td>2 The sediment budget discussion needs to be updated and refined to include reach-specific information.</td>
</tr>
<tr>
<td></td>
<td>3 Railroad Reach Conversion Criterion assumptions and values are not substantiated or consistent.</td>
</tr>
<tr>
<td></td>
<td>4 There are significant uncertainties associated with the selected value of the Minimum Beach Criterion that are not considered in the project alternatives evaluation and plan formulation analyses.</td>
</tr>
<tr>
<td></td>
<td>5 The use of the San Diego Association of Governments (SANDAG) project to predict the performance of the San Clemente project has not been justified.</td>
</tr>
<tr>
<td></td>
<td>6 The values used to represent expected storm-induced cross-shore sand transport and beach change have not been verified to site-specific conditions.</td>
</tr>
</tbody>
</table>
Details on sediment compatibility and relationship of depth to closure need to be added to the equilibrium beach profile, toe of fill, and rock coverage analyses.

The volume-to-area relationship used to derive beach fill volume and expected fill performance is not supported and additional details are needed on specific beach profile characteristics and beach fill design parameters.

**Significance – Medium**

9. The significance of the loss of surfgrass and kelp bed communities should be defined.
10. The description of each planning reach should include information on the reach’s economic, environmental, socio-demographic, and engineering characteristics, and the rationale for the elimination of specific reaches needs to be better described.
11. Based on the information provided, it was not evident that a sufficient level of public involvement took place.
12. Cost effectiveness and not cost should be used for screening the measures.
13. More thorough documentation and analysis is needed on management measures to justify the selection of the alternative.
14. More detailed examination of the impacts of future sea level rise on the project is warranted.
15. Impacts of the project to the local community are not described in detail sufficient to provide a clear and accurate representation of the current conditions in the study area.
16. The cost analysis assumptions are reasonable; however, the mobilization/demobilization costs and the estimate of contingencies should be revised to reflect equipment availability, travel times, and production capacity.
17. It is not clear whether Borrow Area 2A can satisfy the project’s 50-year needs.
18. Since the coastal storm damage model does not appear to have been certified, then the model itself and particularly the key random variables need to be described in considerably more detail, and evidence of model certification should be provided.
19. It is not clear how the effects of loose rock and cobble in the San Clemente beach profile affect beach dynamics and expected project performance.
20. Some elements of project monitoring are missing and an adaptive management plan needs to be developed.
21. The effects of borrow area sediment quality variation on water quality, project constructability, and project performance could be different than those discussed in the report.

**Significance – Low**

22. The calibration of railroad damage functions is not clear.
23. There are omissions in the Environmental Impact Statement’s section on Biological Resources (including unclear figures, missing information on surfgrass fauna, and incomplete discussions on shorebirds and sea turtles) that need to be addressed.
24. Recreational benefits must be treated as incidental benefits of the project.

The IEPR panel members agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USACE, 2010; p. D-4) in the San Clemente Feasibility Study. The following statements summarize the Panel’s findings.
Plan Formulation: Several aspects of the plan formulation component of the San Clemente Feasibility Study lack the details necessary to fully understand the decision-making process. In particular, more details are needed on the following: the screening process for management measures, the population and properties potentially impacted by the project, and the public involvement process.

Economics: Overall, the economics portions of the report are well written, and do not include any serious issues. However, one minor concern is the lack of documentation supporting the use of an uncertified beach damage model. In addition, while the economics appendix demonstrates a clear understanding that recreational benefits are treated as incidental, the Feasibility Report’s Sections 4.5 and 4.6 suggest, in contrast, that recreation was a primary planning objective.

Engineering: There are several significant engineering assumptions and analyses that affect plan formulation results which are not substantiated or well justified. There also are several parameters included in the integrated engineering-economic model that are not well supported by data, assumptions, and analyses. Further, these parameters inherently have a high degree of uncertainty that is not quantified and included in plan formulation. Additional data and analyses to substantiate the assumptions, and consideration of the uncertainties must be incorporated into the plan formulation analyses.

Environmental: The environmental review of the project was generally clear and thorough; however, the discussion on the significance of impacts on two habitats (surfgrass and kelp beds) that are of primary concern when selecting beach width alternatives were inconsistent and not substantiated. While uncertainties exist as to the likely impact on these communities due to sand burial, the document does not provide an adequate approach to determining the significance on these communities and the species they support nor a clear adaptive management program to deal with the uncertainty.
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Appendix A Final Panel Comments on the San Clemente Feasibility Study IEPR
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<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>Engineering Circular</td>
</tr>
<tr>
<td>FWOP</td>
<td>Future without Project</td>
</tr>
<tr>
<td>FWP</td>
<td>Future with Project</td>
</tr>
<tr>
<td>IEPR</td>
<td>Independent External Peer Review</td>
</tr>
<tr>
<td>Lossan</td>
<td>Los Angeles to San Diego</td>
</tr>
<tr>
<td>NEPA</td>
<td>National Environmental Policy Act</td>
</tr>
<tr>
<td>NTP</td>
<td>Notice to Proceed</td>
</tr>
<tr>
<td>OMB</td>
<td>Office of Management and Budget</td>
</tr>
<tr>
<td>SANDAG</td>
<td>San Diego Association of Governments</td>
</tr>
<tr>
<td>USACE</td>
<td>United States Army Corps of Engineers</td>
</tr>
<tr>
<td>USEPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>WRDA</td>
<td>Water Resources Development Act</td>
</tr>
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</table>
1. INTRODUCTION

The San Clemente Shoreline Feasibility Study area is located along the Pacific Ocean coastline in the City of San Clemente, Orange County, California. San Clemente is the southernmost city in Orange County and is bounded by the Camp Pendleton Marine Base and San Onofre State Beach Park to the south; and to the north, by the communities of Capistrano Shores and Dana Point. The original total study area encompasses the City of San Clemente and extends from San Mateo Point, located at the southern boundary of the City, to Dana Point Harbor for a total distance of approximately 12.1 kilometers (7.5 miles).

The beaches throughout this study area have historically suffered from beach erosion due to storm-induced wave attack, with the greatest erosion occurring since the early 1990s. Average beach widths along the city’s shoreline have been gradually reduced, at rates of up to 0.46 meters/year (m/yr) (1.5 feet/year (ft/yr)) during this timeframe. The greatest loss of material has occurred within the 1,370-m (4,500-ft) stretch of beach from Mariposa Street to Cristobal Street (also known as T-Street). The “T-Street” region of the shoreline is a notoriously popular surfing site located immediately south of San Clemente pier, and directly offshore of the T-Street overpass. The T-Street surf break is due to a permanent, hard bottom reef that rises above the seabed. It has become apparent through the study and through interaction with local conservation agencies (e.g., Surfrider), that the unique surfing characteristics in this area could be altered by modification to or burial of the reef. As a result, mitigation of impacts to the reef has become the largest constraint in the plan formulation process for this study. Other constraints include environmental effects including kelp, seagrass, and shallow water rocky habitat.

Running along the entire length of the San Clemente shoreline is a portion of the Lossan (Los Angeles to San Diego) railroad corridor, which is owned by the Orange County Transportation Authority. This commuter rail corridor is among the busiest in the country and separates the beach from the bluff. The study area is divided into ten reaches based on locations of developments and the condition of the revetment that runs along the railroad tracks. Reach 6 extends from Paseo de Cristobal to Linda Lane in the City of San Clemente and contains beach ranging from 5 to 20 m (16 to 66 ft) in width. The beaches are backed by park facilities, railroad tracks, and high coastal bluffs and include the majority of significant structures along the beach.

The purpose of this study is to identify the most technically feasible and economically beneficial “recommended plan” for reducing shoreline erosion and protecting coastal infrastructure from storm-induced wave attack. The reconnaissance phase of this study was initiated on March 28, 2000 under the authority of Section 208 of the River and Harbor Act of 1965. This phase of the study resulted in the finding that there was a Federal interest in continuing into the feasibility phase. The City of San Clemente, which is the non-Federal sponsor, and the U.S. Army Corps of Engineers (USACE) initiated the feasibility phase in September 2001. The feasibility phase study was cost-shared equally between USACE and the non-federal sponsor.

The objective of the work described here was to conduct an Independent External Peer Review (IEPR) of the San Clemente Storm Damage and Shoreline Protection Feasibility Study (San Clemente Feasibility Study) in accordance with procedures described in the Department of the
This final report details the IEPR process, describes the IEPR panel members and their selection, and summarizes the Final Panel Comments of the IEPR Panel on the existing environmental, economic, and hydrologic and hydraulic engineering analyses contained in the San Clemente Feasibility Study. Detailed information on the Final Panel Comments is provided in Appendix A.

2. PURPOSE OF THE IEPR

To ensure that USACE documents are supported by the best scientific and technical information, USACE has implemented a peer review process that uses IEPR to complement the Agency Technical Review, as described in USACE (2010) and USACE (2007).

In general, the purpose of peer review is to strengthen the quality and credibility of the USACE decision documents in support of its Civil Works program. IEPR provides an independent assessment of the economic, engineering, and environmental analysis of the project study. In particular, the IEPR addresses the technical soundness of the project study’s assumptions, methods, analyses, and calculations and identifies the need for additional data or analyses to make a good decision regarding implementation of alternatives and recommendations.

In this case, the IEPR of the San Clemente Feasibility Study was conducted and managed using contract support from Battelle, which is an Outside Eligible Organization under section 501(c)(3) of the U.S. Internal Revenue Code with experience conducting IEPRs for USACE.

3. METHODS

This section describes the methodology followed in selecting the members for the IEPR Panel (the Panel) and in planning and conducting the IEPR. The IEPR was conducted following procedures described in USACE (2010) and in accordance with USACE (2007) and OMB (2004). Supplemental guidance on evaluation for conflicts of interest was obtained from the Policy on Committee Composition and Balance and Conflicts of Interest for Committees Used in the Development of Reports (The National Academies, 2003).

3.1 Planning and Schedule

After receiving the notice to proceed (NTP), Battelle held a kick-off meeting with USACE to review the preliminary/suggested schedule, discuss the IEPR process, and address any questions regarding the scope (e.g., clarify expertise areas needed for panel members). Any revisions to the schedule were submitted as part of the final Work Plan.
Table 1 defines the schedule followed in executing the IEPR. Due dates for milestones and deliverables are based on the NTP date of April 2, 2010. Note that the work items listed in Task 7 occur after the submission of this report.

Table 1. San Clemente Feasibility Study IEPR Schedule

<table>
<thead>
<tr>
<th>TASK</th>
<th>ACTION</th>
<th>DUE DATE</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Notice to Proceed (NTP)</td>
<td>4/2/2010</td>
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<tr>
<td></td>
<td>Review documents available</td>
<td>4/2/2010</td>
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<tr>
<td></td>
<td>End of Period of Performance</td>
<td>11/17/2010</td>
</tr>
<tr>
<td></td>
<td>*Submit Draft Work Plan</td>
<td>4/16/2010</td>
</tr>
<tr>
<td></td>
<td>USACE Provide comments on Draft Work Plan</td>
<td>4/23/2010</td>
</tr>
<tr>
<td></td>
<td>Teleconference (if necessary)</td>
<td>4/23/2010</td>
</tr>
<tr>
<td></td>
<td>*Submit Final Work Plan</td>
<td>4/28/2010</td>
</tr>
<tr>
<td></td>
<td>Battelle requests input from USACE on the conflict of interest (COI) questionnaire</td>
<td>4/9/2010</td>
</tr>
<tr>
<td></td>
<td>USACE Provides comments on COI</td>
<td>4/13/2010</td>
</tr>
<tr>
<td></td>
<td>*Submit list of selected panel members</td>
<td>4/23/2010</td>
</tr>
<tr>
<td></td>
<td>USACE provides comments on selected panel members</td>
<td>4/28/2010</td>
</tr>
<tr>
<td></td>
<td>Complete subcontracts for panel members</td>
<td>5/12/2010</td>
</tr>
<tr>
<td>2</td>
<td>*Submit Draft Charge (combine with Draft Work Plan – Task 1)</td>
<td>4/16/2010</td>
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<tr>
<td></td>
<td>USACE provides comments on draft charge</td>
<td>4/23/2010</td>
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<tr>
<td></td>
<td>*Submit Final Charge (combined with Final Work Plan – Task 1)</td>
<td>4/28/2010</td>
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<tr>
<td></td>
<td>USACE approves Final Charge</td>
<td>4/29/2010</td>
</tr>
<tr>
<td>3</td>
<td>USACE/Battelle Kick-off Meeting</td>
<td>4/9/2010</td>
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<tr>
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<td>Review documents sent to panel members</td>
<td>5/18/2010</td>
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<td></td>
<td>USACE/Battelle/panel Kick-off Meeting with panel members</td>
<td>5/20/2010</td>
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<tr>
<td></td>
<td>External panel members complete their review</td>
<td>6/18/2010</td>
</tr>
<tr>
<td>4</td>
<td>Convene panel review teleconference</td>
<td>6/29/2010</td>
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<td></td>
<td>External panel members provide draft Final Panel Comments (FPCs) to Battelle</td>
<td>7/8/2010</td>
</tr>
<tr>
<td>5</td>
<td>*Submit Final IEPR Report</td>
<td>7/26/2010</td>
</tr>
<tr>
<td>6</td>
<td>Input FPCs to DrChecks Battelle provides FPC response template to USACE</td>
<td>7/28/2010</td>
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<tr>
<td></td>
<td>USACE PDT provides draft Evaluator responses and clarifying questions to Battelle</td>
<td>8/9/2010</td>
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<tr>
<td>7</td>
<td>FPC Teleconference between Battelle, IEPR team, and PDT to discuss FPCs, draft responses and clarifying questions</td>
<td>8/17/2010</td>
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<td>USACE inputs final Evaluator responses in DrChecks</td>
<td>8/31/2010</td>
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<td>Battelle inputs BackCheck responses in DrChecks</td>
<td>9/15/2010</td>
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<td>*Battelle submits pdf printout of DrChecks project file</td>
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<tr>
<td></td>
<td>Project Closeout</td>
<td>11/22/2010</td>
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* Deliverable

3.2 Identification and Selection of IEPR Panel Members

The candidates for the Panel were evaluated based on their technical expertise in the following key areas: coastal or civil design/construction cost engineering; civil works planning; the National Environmental Policy Act (NEPA)/biology; coastal or civil engineering; and
economics. These areas correspond to the technical content of the San Clemente Feasibility Study and overall scope of the San Clemente project.

To identify candidate panel members, Battelle reviewed experts in Battelle’s Peer Reviewer Database, sought recommendations from colleagues, contacted former panel members, and conducted targeted Internet searches. Battelle initially identified more than 26 candidates for the Panel, evaluated their technical expertise, and inquired about potential conflicts of interest. Of these, Battelle chose ten of the most qualified candidates and confirmed their interest and availability. Of the ten candidates, five were proposed for the final Panel and five were proposed as backup reviewers. Information about the candidate panel members, including brief biographical information, highest level of education attained, and years of experience, was provided to USACE for feedback. Battelle made the final selection of panel members according to the selection criteria described in the Work Plan.

The five proposed primary reviewers constituted the final Panel. The remaining candidates were not proposed for a variety of reasons, including lack of availability, disclosed conflicts of interest, or lack of the precise technical expertise required.

The candidates were screened for the following potential exclusion criteria or conflicts of interest.1 These COI questions were intended to serve as a means of disclosure, and to better characterize a potential candidate’s employment history and background. Providing a positive response to a COI screening question did not automatically preclude a candidate from serving on the IEPR Panel. For example, participation in previous USACE technical peer review committees and other technical review panel experience was included as a COI screening question. A positive response to this question could be considered a benefit.

- Involvement by you or your firm2 in any part of the San Clemente Damage and Shoreline Protection Study including the Environmental Assessment and Technical Appendices.
- Involvement by you or your firm2 in any work related to San Clemente, San Mateo Point, Capistrano Shores, Dana Point Harbor, Camp Pendleton, or Orange County area.
- Involvement by you or your firm2 in coastal storm damage reduction, shoreline restoration or shoreline erosion, and/or protection of coastal infrastructure projects in coastal California.
- Involvement by you or your firm2 in the conceptual or actual design, construction, or O&M of any projects for the San Clemente Damage and Shoreline Protection program.
- Current employment by the U.S. Army Corps of Engineers (USACE).

1 Battelle evaluated whether scientists in universities and consulting firms that are receiving USACE-funding have sufficient independence from USACE to be appropriate peer reviewers. See OMB (2004, p. 18), “…when a scientist is awarded a government research grant through an investigator-initiated, peer-reviewed competition, there generally should be no question as to that scientist’s ability to offer independent scientific advice to the agency on other projects. This contrasts, for example, to a situation in which a scientist has a consulting or contractual arrangement with the agency or office sponsoring a peer review. Likewise, when the agency and a researcher work together (e.g., through a cooperative agreement) to design or implement a study, there is less independence from the agency. Furthermore, if a scientist has repeatedly served as a reviewer for the same agency, some may question whether that scientist is sufficiently independent from the agency to be employed as a peer reviewer on agency-sponsored projects.”

2 Includes any joint ventures in which your firm is involved.
• Involvement with paid or unpaid expert testimony related to the San Clemente Damage and Shoreline Protection Program.

• Current or previous employment or affiliation with the non-Federal sponsors or any of the following cooperating Federal, State, County, local and regional agencies, environmental organizations, and interested groups: following Federal, State, County, local and regional agencies, environmental organizations, and interested groups: U.S. Coast Guard, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service, California Coastal Commission, California Department of Fish and Game, California Department of Boating and Waterways, California Regional Water Quality Control Board, Office of Historic Preservation, City of San Clemente, South Coast Air Quality Management District, Surfrider International, Southern California Regional Railroad Authority, Orange County Transportation Authority, and Metrolink-related projects (for pay or pro bono)

• Past, current, pending, or future interests (financial or otherwise) by you, your spouse or children related to the San Clemente Damage and Shoreline Protection Study, including interest in San Clemente Damage and Shoreline Protection related contracts or awards from USACE.

• Current personal involvement with other USACE projects, including whether involvement was to author any manuals or guidance documents for USACE. If yes, provide titles of documents or description of project, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role. Please highlight and discuss in greater detail any projects that are specifically involved in with the Los Angeles District.

• Current firm2 involvement with other USACE projects, specifically those projects/contracts that are with the Los Angeles District. If yes, provide title/description, dates, and location (USACE district, division, Headquarters, ERDC, etc.), and position/role.

• Any previous employment by the USACE as a direct employee or contractor (either as an individual or through your firm2) within the last 10 years, notably if those projects/contracts were with the Los Angeles District. If yes, provide title/description, dates employed, and place of employment (district, division, Headquarters, ERDC, etc.), and position/role.

• Previous experience conducting technical peer reviews. If yes, please highlight and discuss any technical reviews concerning the following, and include the client/agency and duration of review (approximate dates):

  • shoreline restoration projects
  • coastal storm damage mitigation
  • shoreline erosion and protection of coastal infrastructure.

• A significant portion (i.e., greater than 50%) of personal or firm2 revenues within the last 3 years came from USACE contracts.

• Participation in relevant prior Federal studies/programs relevant to this project, such as:

• State of the Coast Report, Coast of California Storm and Tidal Wave Study, San Diego Region, Littoral Zone Sediments Report, Corps of Engineers, 1988
• State of the Coast Report, San Diego Region, Historic Wave and Sea Level Data Report, Corps of Engineers, 1988
• State of the Coast Report, Coast of California Storm and Tidal Wave Study, San Diego Region, Main Report, Corps of Engineers, 1991
• Wave Information Studies of US Coastlines, Southern California Hindcast Wave Information, Corps of Engineers, 1992
• Strategic Rail Corridor Network (STRACNET) and Defense Connector Lines, Military Traffic Command, Transportation Agency, 1998
• Oceanographic Design Conditions for the Repair of the San Clemente Pier, Moffatt & Nichol Engineers, 1983
• Beach Width and Profile Surveys, City of San Clemente, 2000 & 2002
• Draft Mitigated Negative Declaration, Marblehead Coastal Beach Replenishment Project, City of San Clemente, 2000

• Participation in relevant prior non-Federal studies/programs relevant to this project.
• Any publicly documented statement (including, for example, advocating for or discouraging against) related to the San Clemente Damage and Shoreline Protection program.
• Is there any past, present or future activity, relationship or interest (financial or otherwise) that could make it appear that you would be unable to provide unbiased services on this project? If so, please describe:

In selecting the final members of the Panel from the list of candidates, Battelle chose experts who best fit the expertise areas and had no conflicts of interest. The five final reviewers were either affiliated with academic institutions or consulting companies. Battelle established subcontracts with the panel members when they indicated their willingness to participate and confirmed the absence of conflicts of interest through a signed Conflict of Interest form. Although the Panel was disclosed to USACE, Battelle made the final decision on selecting the Panel. Section 4 of this report provides names and biographical information on the panel members.

Prior to beginning their review and within 6 days of their subcontracts being finalized, all members of the Panel attended a kick-off meeting via teleconference planned and facilitated by Battelle in order to review the IEPR process, the schedule, communication, and other pertinent information for the Panel.

3.3 Preparation of the Charge and Conduct of the IEPR

Battelle drafted a preliminary charge document, including specific charge questions and discussion points. The draft charge was prepared by Battelle to assist the USACE in the development of the charge questions that will guide the peer review, according to guidance provided in USACE (2010) and OMB (2004). The draft charge was submitted to the USACE for evaluation as part of the draft Work Plan. USACE provided comments and revisions to the draft
charge, which were used to produce the final charge. The final charge was submitted to USACE for approval. In addition to a list of 151 charge questions/discussion points, the final charge included general guidance for the Panel on the conduct of the peer review (provided in Appendix B of this final report).

Battelle planned and facilitated a final kick-off meeting via teleconference during which USACE presented project details to the Panel. Before the meeting, the IEPR Panel received an electronic version of the San Clemente Feasibility Study documents and the final charge. A full list of the documents reviewed by the Panel is provided in Appendix B of this report. The Panel was instructed to address the charge questions/discussion points within a comment-response form provided by Battelle.

3.4 Review of Individual Comments

The Panel produced approximately 400 individual comments in response to the charge questions/discussion points. Battelle reviewed the comments to identify overall recurring themes, areas of potential conflict, and other overall impressions. As a result of the review, Battelle was able to summarize the 400 comments into a preliminary list of 22 overall comments and discussion points. Each panel member’s individual comments were shared with the full Panel in a merged individual comments table.

3.5 IEPR Panel Teleconference

Battelle facilitated a 4-hour teleconference with the Panel so that the panel experts, many of whom are from diverse scientific backgrounds, could exchange technical information. The main goal of the teleconference was to identify which issues should be carried forward as Final Panel Comments and to decide which panel member would serve as the lead author for the development of each Final Panel Comment. This information exchange ensured that the final IEPR report would accurately represent the Panel’s assessment of the project, including any conflicting opinions. The Panel engaged in a thorough discussion of the overall negative comments, positive comments, and comments that appeared to be conflicting among panel members. In addition, Battelle confirmed each comment’s level of significance to the Panel, added any missing issues of high-level importance to the findings, resolved whether to “agree to disagree” on the conflicting comments, and merged any related individual comments.

There were no charge questions identified by Battelle where there appeared to be disagreement among panel members.

At the end of these discussions, the Panel identified 24 comments and discussion points that should be brought forward as Final Panel Comments.

3.6 Preparation of Final Panel Comments

Following the teleconference, Battelle prepared a summary memorandum for the Panel documenting each Final Panel Comment (organized by level of significance). The memorandum provided the following detailed guidance on the approach and format to be used to develop the Final Panel Comments for the San Clemente Feasibility Study:
Lead Responsibility: For each Final Panel Comment, one Panel member was identified as the lead author responsible for coordinating the development of the Final Panel Comment and submitting it to Battelle. Battelle modified lead assignments at the direction of the Panel. To assist each lead in the development of the Final Panel Comments, Battelle distributed merged individual comments in the comment-response form table, a summary detailing each draft final comment statement, an example Final Panel Comment following the four-part structure described below, and a template for the preparation of the Final Panel Comments.

Directive to the Lead: Each lead was encouraged to communicate directly with other IEPR Panel members as needed and to contribute to a particular Final Panel Comment. If a significant comment was identified that was not covered by one of the original Final Panel Comments, the appropriate lead was instructed to draft a new Final Panel Comment.

Format for Final Comments: Each Final Panel Comment was presented as part of a four-part structure:
1. Comment Statement (succinct summary statement of concern)
2. Basis for Comment (details regarding the concern)
3. Significance (high, medium, low; see description below)
4. Recommendation for Resolution (see description below).

Criteria for Significance: The following were used as criteria for assigning a significance level to each Final Panel Comment:
1. High: Describes a fundamental problem with the project that could affect the recommendation or justification of the project
2. Medium: Affects the completeness or understanding of the reports/project
3. Low: Affects the technical quality of the reports but will not affect the recommendation of the project.

Guidance for Developing the Recommendation: The recommendation was to include specific actions that the USACE should consider to resolve the Final Panel Comment (e.g., suggestions on how and where to incorporate data into the analysis, how and where to address insufficiencies, areas where additional documentation is needed).

At the end of this process, 24 Final Panel Comments were prepared and assembled. Battelle reviewed and edited the Final Panel Comments for clarity, consistency with the comment statement, and adherence to guidance on the Panel’s overall charge, which included ensuring that there were no comments regarding either the appropriateness of the selected alternative or USACE policy. There was no direct communication between the Panel and USACE during the preparation of the Final Panel Comments. The Final Panel Comments are presented in Appendix A of this report.

4. PANEL DESCRIPTION

Candidates for the Panel were identified using Battelle’s Peer Reviewer Database, seeking recommendations from colleagues, contacting former panel members, and conducting targeted
Internet searches. Battelle prepared a draft list of primary and backup candidate panel members (which were screened for availability, technical background, and conflicts of interest), and provided it to USACE for feedback. Battelle made the final selection of panel members.

An overview of the credentials of the final five members of the Panel and their qualifications in relation to the technical evaluation criteria is presented in Table 2. More detailed biographical information regarding each panel member and his or her area of technical expertise is presented in the text that follows the table.
<table>
<thead>
<tr>
<th>Coastal or Civil Engineering (one expert needed)</th>
<th>Creed</th>
<th>Poff</th>
<th>Brody</th>
<th>Luckie</th>
<th>Josselyn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum 10 years experience in coastal or civil engineering</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Familiar with large, complex civil works projects with high public and interagency interests</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Experience with engineering analyses related to coastal storm damage or related projects in the coastal environment</td>
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<td>X</td>
<td></td>
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<tr>
<td>Experience with the review of design and construction activities (i.e., Safety Assurance Review)</td>
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<td></td>
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<tr>
<td>Familiar with standard USACE coastal computer models</td>
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<tr>
<td>M.S. degree or higher in coastal engineering, civil engineering, or hydrology and hydraulics</td>
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<tr>
<td>Registered Professional Engineer</td>
<td>X</td>
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<tr>
<td>Coastal or Civil Design/Construction Cost Engineering (one expert needed)</td>
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<tr>
<td>Minimum 10 years experience in coastal or civil design/construction cost engineering</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Familiar with large, complex civil works projects with high public and interagency interests</td>
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<td>X</td>
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<tr>
<td>Demonstrated experience in performing cost engineering and construction management for all phases of coastal storm damage or related projects</td>
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<td>X</td>
<td></td>
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<tr>
<td>Experience in associated contracting procedures, total cost growth analysis, and related cost risk analysis desired</td>
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<td>X</td>
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<tr>
<td>Familiar with similar projects across the United States and the related cost engineering</td>
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<tr>
<td>Familiar with construction industry and practices used in the coastal environment of western U.S.</td>
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<td>Degree in coastal or civil engineering</td>
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<td>Civil Works Planning (one expert needed)</td>
<td>Creed</td>
<td>Poff</td>
<td>Brody</td>
<td>Luckie</td>
<td>Josselyn</td>
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<tr>
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<tr>
<td>Experience in the plan formulation process</td>
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<tr>
<td>Familiar with evaluation of alternative plans for coastal storm damage reduction projects</td>
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<td></td>
<td>X</td>
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</tr>
<tr>
<td>Familiarity with USACE standards and procedures</td>
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<tr>
<td>Degree in planning or related field</td>
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<table>
<thead>
<tr>
<th>Economist (one expert needed)</th>
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<tr>
<td>Minimum 10 years experience in economics</td>
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<td>X</td>
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<tr>
<td>Familiar with large, complex civil works projects with high public and interagency interests</td>
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<tr>
<td>Familiar with methods for conducting coastal storm damage economic analysis</td>
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<tr>
<td>Familiar with estimating damage and costs associated with:</td>
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<tr>
<td>Coastal erosion</td>
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<td>Waves</td>
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<td>X</td>
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<tr>
<td>Inundation</td>
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<tr>
<td>Knowledge and experience conducting and evaluating risk based analysis utilizing:</td>
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<td></td>
<td>X</td>
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<tr>
<td>Microsoft Excel</td>
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<td>Palisade @Risk Software</td>
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<tr>
<td>Have access to Palisade @Risk software</td>
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<tr>
<td>Experience with National Economic Development analysis procedures related to coastal storm damage analysis and beach recreation projects</td>
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<tr>
<td>Degree in economics</td>
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<td>NEPA and Biology (one expert needed)</td>
<td>Creed</td>
<td>Poff</td>
<td>Brody</td>
<td>Luckie</td>
<td>Josselyn</td>
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<td>Minimum 10 years experience in ecology or biology</td>
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<tr>
<td>Familiar with large, complex civil works projects with high public and interagency interests</td>
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<tr>
<td>Particular knowledge of ecosystem restoration</td>
<td></td>
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<tr>
<td>Experience in the coastal environment of the western U.S.</td>
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</tr>
<tr>
<td>Familiar with all NEPA requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>M.S. degree or higher in ecology or biology</td>
<td></td>
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</tbody>
</table>
Christopher Creed, P.E.
Role: This panel member was chosen primarily for his coastal and civil engineering experience and expertise.

Mr. Christopher Creed, P.E., is a senior engineer and vice-president for Olsen Associates, Inc., specializing in coastal and oceanographic engineering and near shore coastal processes. He earned his M.S. in Coastal and Oceanographic Engineering from the University of Delaware in 1992. He has over 20 years of experience in the coastal and civil engineering field and is a licensed civil engineer in both Florida and South Carolina. Mr. Creed has been the principal investigator, project manager, and engineer of record for numerous large public civil works projects constructed in the southeastern United States. These projects, such as the Hilton Head Island Beach Renourishment Project, the Ocean Ridge Florida Federal Shore Protection Project, and the Port Royal Shoreline Restoration and Stabilization Project, involved comprehensive beach restoration, shore stabilization, inlets sand bypassing, and sand management. These large Civil Works projects required extensive intergovernmental and interagency coordination relating to project formulation, permitting and funding. His specific coastal storm damage experience is related to beach fill, revetment, groin, and inlet jetty design formulation and analysis; beach and structure storm response modeling; and coastal structure storm wave loading modeling, among others. Analyses include development of probable wind, wave, and water level storm parameters and beach response models to evaluate risk, stability, and vulnerability of shorefront infrastructure. He has performed construction oversight as engineer of record on numerous projects. Mr. Creed has an in-depth understanding of construction methodologies, physical site requirements, equipment limitations, and safety considerations that are common to large-scale marine construction, and uses his experience to review design and proposed construction activities. Mr. Creed is familiar with USACE coastal computer models including ACES, RCPWAVE, STWAVE, GENESIS, EST, SBEACH, CHAMPS, WHAFIS, and SDU-RU (storm damage benefit model) as well as performing preliminary application work with Beach-fx. He is a member of the American Society of Civil Engineers, American Shore and Beach Preservation Association, Board member of the Association of Coastal Engineers, and Diplomate, Coast Engineer of the Academy of Coastal, Ocean, Port and Navigation Engineers (ACOPNE).

Michael Poff, P.E.
Role: This panel member was chosen primarily for his coastal or civil design/construction cost engineering experience and expertise.
Affiliation: Coastal Engineering Consultants, Inc.

Mr. Michael Poff, P.E., is vice president of engineering for Coastal Engineering Consultants, Inc., a firm specializing in civil, coastal, and environmental projects. He holds a M.S. degree in coastal engineering from the University of Delaware and has over 20 years of experience in the coastal design/construction cost engineering field. He is a registered Professional Engineer in the states of Florida and Louisiana, and is experienced in project management, civil design, coastal engineering design, environmental permitting, and marine survey services. His design experience includes beach, dune, and marsh fill layouts; borrow area geometry; inlet and navigation channel dredge templates; channel markers; coastal structures such as groins, jetties and revetments; beachfront stormwater drainage; and dune vegetation. He is experienced with large complex civil
works projects with high public and interagency interests on the order of $200 million, and has overseen construction of five major coastal restoration projects including Charlotte County Erosion Control and Storm Damage Reduction, Bay Joe Wise Barrier Island Ecosystem Restoration, and Blind Pass Ecosystem Restoration. His responsibilities included pay request review/approval, preparation of field change orders, pay survey review/verification, and project certification. He is also experienced in performing cost engineering and construction management for all phases of beach restoration, beach maintenance, and mitigation planning for both small- and large-scale projects including federal ecosystem restoration projects. Mr. Poff has performed cost growth analyses and risk assessment analyses for several federal projects, as well as cost engineering and related services for marine projects. He is experienced in the construction industry and practices of the coastal environment of the southeastern United States as well as being familiar with those followed in the western United States. He is experienced with the USACE application of risk and uncertainty analyses in coastal damage reduction and is using it as part of the Terrebonne Basin Barrier Shoreline Restoration Project. He is also serving as principal investigator for restoring the barrier islands within the Terrebonne Basin, including oversight of coastal processes modeling, alternatives analysis, cost estimating and incremental cost analysis. Mr. Poff is experienced with the IEPR process, and has participated on a previous team review of storm damage reduction. He is a member of the Florida Shore and Beach Preservation Association, American Society of Engineers, and the Florida Engineering Society/Florida Institute of Consulting Engineers Leadership Institute

Samuel Brody
Role:  This panel member was chosen primarily for his civil works planning experience and expertise.
Affiliation:  Texas A&M University

Dr. Sam Brody, is the Director of the Environmental Planning and Sustainability Research Unit and Acting Director of the Hazard Reduction and Recovery Center for Texas A&M University, where he researches environmental hazard and disaster mitigation, preparedness, response, and recovery. He is also the Director of the Center for Texas Beaches and Shores for Texas A&M University. In that role he is actively involved in addressing wetland alteration, beach erosion, coastal sustainability, coastal restoration issues and the related plan formulation processes. Dr. Brody holds a Ph.D. in environmental planning from University of North Carolina Chapel Hill, specializing in ecosystem management and collaborative environmental planning. He has over 19 years of experience in the fields of marine science and urban planning, and has conducted research and published articles on the effectiveness of structural mitigation techniques and complex civil works projects on flood reduction and surge suppression. Dr. Brody had conducted extensive research and published dozens of peer-reviewed publications on planning for coastal storm reduction projects. He is familiar with USACE standards and procedures, having assessed, lectured, and written about USACE permitting and planning standards as they apply to coastal hazard mitigation. He also has experience in the private consulting field, working as an environmental correspondent, environmental consultant, and coastal policy analyst. He is the author or co-author of numerous planning books and technical reports including “Estimating Flood Damage in Texas using GIS: Predictors, Consequences, and Policy Implications,” “Rising Waters: Evidence for Reducing Floods in the 21stCentury,” and “Evaluating California Local Land Use Plans’ Environmental Impact Reports.” Dr. Brody is a Fellow of the Institute for
David Luckie
Role: This panel member was chosen primarily for his economics experience and expertise.
Affiliation: CivilTech Engineering, Inc.

Mr. David Luckie is currently the Principal Economist at CivilTech Engineering, Inc. and has over 20 years of professional experience in economics, planning, plan formulation, benefit-cost analysis, and risk-based analysis. He earned his B.S. in economics from the University of South Alabama in 1986. For 16 years, Mr. Luckie worked for USACE, Mobile District in the Planning and Environmental Division where he was involved in numerous high profile civil works projects, including the Alabama-Coosa Tallapoosa-Apalachicola Chattahoochee Flint Comprehensive (ACT-ACF) studies which covered water resource planning issues for two watersheds and three states. Mr. Luckie has experience providing detailed forecasts of coastal storm damage reduction benefits, including working on the Panama City Beaches Storm Damage Reduction Project in northwest Florida. His responsibilities included assisting in development of the without-project conditions including the structure inventory, followed by assisting in the development and screening of alternative plans to reduce coastal storm damage from tropical storms, hurricanes, and winter storm events. He is also familiar with estimating damage and costs associated with coastal erosion, waves, and inundation. In the wake of Hurricanes Erin, Opal, Georges, Ivan, and Dennis, Mr. Luckie conducted extensive inventories of structures affected or damaged by the storms. His responsibilities included assembling a comprehensive database of damaged structures and facilities (residential, commercial, industrial, and government); conducting damage assessments of each asset using a standardized building performance assessment form; and collecting data on structure type, structure purpose, structure condition, damage incurred, mode of damage (including waves, inundation, or erosion), and the likelihood of the structure to withstand similar events. Mr. Luckie is a prolific Microsoft Excel modeler and he has developed numerous risk-based tools to model water shortage risk, decision tree analysis, and warning system effectiveness. Mr. Luckie has built numerous @Risk simulations to conduct Monte Carlo analyses covering a broad array of water resource risk and uncertainty issues. He is very familiar with National Economic Development (NED) procedures and USACE’s Planning Guidance Notebook (ER 1105-2-10).

Michael Josselyn
Role: This panel member was chosen primarily for his NEPA and biology experience and expertise.
Affiliation: WRA Environmental Consultants, Inc.

Dr. Michael Josselyn is a senior wetland scientist with WRA Environmental Consultants, Inc. and is the principal-in-charge for the firm’s wetland restoration and mitigation projects, conservation planning studies, federal and state permitting, and remedial action plans for wetlands in hazardous waste sites. He is also a Professor Emeritus at San Francisco State University in the Biology Department where he was a Professor for 22 years and Director of the Romberg Tiburon Center for Environmental Studies for 8 years. He earned his Ph.D. in marine botany from the University of New Hampshire in 1978 and has 30 years of experience in wetland
ecology and restoration. He has published over 50 papers on wetland ecology, seagrass ecology, and habitat restoration. Dr. Josselyn has been the lead scientist or manager on numerous major wetland mitigation and restoration projects for transportation agencies, port authorities, utilities, private developers, and non-profit organizations. He has led multi-disciplinary teams in the preparation of major wetland restoration plans in San Francisco Bay and southern California and he is the recipient of awards for his work at the 1000-acre Bolsa Chica tidal restoration project, the Gateway Center tidal wetland in San Francisco Bay, and for the design of freshwater wetlands at the Santa Lucia Preserve in Monterey. His restoration projects have also included serving as the lead biological consultant on the Batiquitos Lagoon Restoration in Carlsbad, California which involved the restoration of tidal action to the lagoon, the dredging and creation of least tern nesting islands, and the recovery of salt marsh and eelgrass habitats. He has been the project manager for numerous projects that required National Environmental Policy Act (NEPA) compliance in permitting and project design, including the Wilder Development residential development project and the Bolsa Chica tidal restoration project, both of which required an Environmental Impact Report. For the past 10 years he has been on-call with State Coastal Conservancy to provide expert evaluation of coastal restoration projects. Dr. Josselyn has served on national advisory committees to the USACE, U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), and the National Wetlands Technical Council in the development of federal wetland policy and research. He has taught courses in wetland restoration and mitigation for the USACE, the Wetland Training Institute, and Continuing Legal Education (CLE) International and he is a member of the Society of Wetland Scientists, American Association for the Advancement of Science and the Association of Environmental Professionals.

5. SUMMARY OF FINAL PANEL COMMENTS

The IEPR panel members agreed on their “assessment of the adequacy and acceptability of the economic, engineering, and environmental methods, models, and analyses used” (USACE, 2010; p. D-4) in the San Clemente Feasibility Study. The following statements summarize the Panel’s findings, which are described in the Final Panel Comments (Table 3) and discussed in more detail in Appendix A.

**Plan Formulation:** Several aspects of the plan formulation component of the San Clemente Feasibility Study lack the details necessary to fully understand the decision-making process. In particular, more details are needed on the following: the screening process for management measures, the population and properties potentially impacted by the project, and the public involvement process.

**Economics:** Overall, the economics portions of the report are well written, and do not include any serious issues. However, one minor concern is the lack of documentation supporting the use of an uncertified beach damage model. In addition, while the economics appendix demonstrates a clear understanding that recreational benefits are treated as incidental, the Feasibility Report’s Sections 4.5 and 4.6 suggest, in contrast, that recreation was a primary planning objective.

**Engineering:** There are several significant engineering assumptions and analyses that affect plan formulation results which are not substantiated or well justified. There also are several
parameters included in the integrated engineering-economic model that are not well supported by data, assumptions, and analyses. Further, these parameters inherently have a high degree of uncertainty that is not quantified and included in plan formulation. Additional data and analyses to substantiate the assumptions, and consideration of the uncertainties must be incorporated into the plan formulation analyses.

**Environmental:** The environmental review of the project was generally clear and thorough; however, the discussion on the significance of impacts on two habitats (surfgrass and kelp beds) that are of primary concern when selecting beach width alternatives were inconsistent and not substantiated. While uncertainties exist as to the likely impact on these communities due to sand burial, the document does not provide an adequate approach to determining the significance on these communities and the species they support nor a clear adaptive management program to deal with the uncertainty.

Table 3 lists the 24 Final Panel Comment statements by level of significance.

**Table 3. Overview of 24 Final Panel Comments Identified by San Clemente Feasibility Study IEPR Panel**

<table>
<thead>
<tr>
<th>Significance – High</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The assumption that the existing beach is erosional is not supported by the data and analyses used to develop representative Future without Project conditions</td>
</tr>
<tr>
<td>2</td>
<td>The sediment budget discussion needs to be updated and refined to include reach-specific information.</td>
</tr>
<tr>
<td>3</td>
<td>Railroad Reach Conversion Criterion assumptions and values are not substantiated or consistent.</td>
</tr>
<tr>
<td>4</td>
<td>There are significant uncertainties associated with the selected value of the Minimum Beach Criterion that are not considered in the project alternatives evaluation and plan formulation analyses.</td>
</tr>
<tr>
<td>5</td>
<td>The use of the San Diego Association of Governments (SANDAG) project to predict the performance of the San Clemente project has not been justified.</td>
</tr>
<tr>
<td>6</td>
<td>The values used to represent expected storm-induced cross-shore sand transport and beach change have not been verified to site-specific conditions.</td>
</tr>
<tr>
<td>7</td>
<td>Details on sediment compatibility and relationship of depth to closure need to be added to the equilibrium beach profile, toe of fill, and rock coverage analyses.</td>
</tr>
<tr>
<td>8</td>
<td>The volume-to-area relationship used to derive beach fill volume and expected fill performance is not supported and additional details are needed on specific beach profile characteristics and beach fill design parameters.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significance – Medium</th>
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</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>The significance of the loss of surfgrass and kelp bed communities should be defined.</td>
</tr>
<tr>
<td>10</td>
<td>The description of each planning reach should include information on the reach’s economic, environmental, socio-demographic, and engineering characteristics, and the rationale for the elimination of specific reaches needs to be better described.</td>
</tr>
<tr>
<td>11</td>
<td>Based on the information provided, it was not evident that a sufficient level of public involvement took place.</td>
</tr>
<tr>
<td></td>
<td>Cost effectiveness and not cost should be used for screening the measures.</td>
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<tr>
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<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>13</td>
<td>More thorough documentation and analysis is needed on management measures to justify the selection of the alternative.</td>
</tr>
<tr>
<td>14</td>
<td>More detailed examination of the impacts of future sea level rise on the project is warranted.</td>
</tr>
<tr>
<td>15</td>
<td>Impacts of the project to the local community are not described in detail sufficient to provide a clear and accurate representation of the current conditions in the study area.</td>
</tr>
<tr>
<td>16</td>
<td>The cost analysis assumptions are reasonable; however, the mobilization/demobilization costs and the estimate of contingencies should be revised to reflect equipment availability, travel times, and production capacity.</td>
</tr>
<tr>
<td>17</td>
<td>It is not clear whether Borrow Area 2A can satisfy the project’s 50-year needs.</td>
</tr>
<tr>
<td>18</td>
<td>Since the coastal storm damage model does not appear to have been certified, then the model itself and particularly the key random variables need to be described in considerably more detail, and evidence of model certification should be provided.</td>
</tr>
<tr>
<td>19</td>
<td>It is not clear how the effects of loose rock and cobble in the San Clemente beach profile affect beach dynamics and expected project performance.</td>
</tr>
<tr>
<td>20</td>
<td>Some elements of project monitoring are missing and an adaptive management plan needs to be developed.</td>
</tr>
<tr>
<td>21</td>
<td>The effects of borrow area sediment quality variation on water quality, project constructability, and project performance could be different than those discussed in the report.</td>
</tr>
</tbody>
</table>

**Significance – Low**

<table>
<thead>
<tr>
<th></th>
<th>The calibration of railroad damage functions is not clear.</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>There are omissions in the Environmental Impact Statement’s section on Biological Resources (including unclear figures, missing information on surfgrass fauna, and incomplete discussions on shorebirds and sea turtles) that need to be addressed.</td>
</tr>
<tr>
<td>23</td>
<td>Recreational benefits must be treated as incidental benefits of the project.</td>
</tr>
</tbody>
</table>
6. REFERENCES


APPENDIX A

Final Panel Comments

on the

San Clemente Feasibility Study IEPR
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The assumption that the existing beach is erosional is not supported by the data and analyses used to develop representative Future without Project conditions

Basis for Comment:
Data collected between 1984 and 2003 at four beach monitoring transects are used to develop the representative Future without Project (FWOP) shoreline change rate. Although these data are appropriate for evaluating FWOP shoreline conditions, these data do not present compelling evidence that there is a persistent, long-term shoreline erosion problem along the San Clemente study shoreline, especially along Reach 6.

Among the documented shoreline positions presented in Figure 2-12 (Page 24 of the Coastal Engineering Appendix), only the data collected at SC 1623 (State Beach) suggest a possible net shift of the shoreline to a position that is landward of all positions documented between 1984 and 2003. Even at this location, the data do not conclusively suggest that this net change is indicative of a long-term problem but rather may be within the range of earlier high frequency variations of shoreline shifts. Only one of the latter two data points included in the SC 1623 dataset is landward of earlier documented shoreline positions.

At SC 1680 (Linda Lane) and SC 1660 (T-Street), the most landward documented shoreline position in 2002 is not landward of numerous shoreline positions documented between 1984 and 1990, and within the range of apparent seasonal shoreline position variations. Also, it is not clear that the limited number of data points included in the latter portion of the dataset represent a long-term change to the beach. Most are within the range of earlier documented seasonal variations of beach change.

Due to extreme and unexplained outlying data points (e.g., 1984 T-street position, 1990 State Beach position, and mid-2002 State Beach position) and the large time gap between numerous measurements between 1984 and 1988 and only two measurements between 2002 and 2003, the linear regression applied to the data trend lines seems to misrepresent the actual documented shoreline changes.

Significance – High:
Accurate representation of the FWOP shoreline change conditions is essential for plan formulation. The presence of persistent, long-term beach erosion is a principal shoreline problem condition that is necessary for project justification.

Recommendations for Resolution:
To resolve these concerns, the report would need to include the following:

2. An evaluation of shoreline change trend for the 1984 to 1990 period only and a comparison to changes represented by 2002/03 documented shoreline positions.
3. An analysis that eliminates the upper and lower extreme data points in each dataset, recomputes shoreline change rates, and compares to absolute change. This may also facilitate an assessment of the uncertainties associated with this dataset.
4. Consideration of other available data (aerial photographs, measurements, etc.) in the analysis to validate the shoreline change rate and associated distribution.
5. Comparative profile plots of all the data and each transect to demonstrate the applicability of using mean sea level (MSL) as the appropriate contour to represent total beach profile change.
6. An analysis of changes to beach elevations other than MSL and comparison to MSL results.
7. A new beach profile survey of the four transects and comparison to historical conditions.
## Final Panel Comment 2:

**The sediment budget discussion needs to be updated and refined to include reach-specific information.**

### Basis for Comment:

The sediment budget is outdated. It is based on a 1991 report and rather than utilizing current profile data and/or modeling, it seemingly relies on data that are 20 years old.

The sediment budget suggests that the shoreline along the study area between Dana Point and San Mateo Point is net accretional. This is consistent with the statement that “Prior to the 1990’s, the beaches within the study area were quasi-stable;” however, it is inconsistent with the subsequent statement “Since the 1990’s, the beaches within the study area have experienced gradual erosion due to the decrease of fluvial sand supply resulting from the damming and concreting of creeks and rivers, and urban development” [Main Report pg. 55].

The report states “…the shoreline is essentially in balance between erosion and accretion” [Main Report pg.35]. It is not clear how this statement applies to the individual reaches because the sediment budget is not specific to the individual reaches, and a specific beach volume change analysis for each reach is not presented.

Documented beach volume changes along the study shoreline are not presented or considered for representing natural beach dynamics and alongshore variability, nor for designing the beach fill measures. Volume change analyses in conjunction with shoreline change analyses are customary for coastal engineering analysis of beach change conditions, National Economic Development (NED) plan formulation, development of alternatives, and assessment of project performance.

### Significance – High:

Development of the Reach 6 sediment budget to substantiate the stated problems with erosion, reduced beach width, increased storm damage, public facility vulnerabilities, loss of recreation, etc., is necessary to justify the project. A beach volume change analysis is critical for a more clear understanding of site conditions and project needs as well as for plan formulation.

### Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. Graphic comparisons of all available beach profile surveys (e.g., profile comparisons).
2. Beach volume change analysis for each individual reach.
3. Sediment budget for each individual reach.
4. Spatial details to evaluate localized areas of volumetric accretion and erosion along the San Clemente Reach 6 shoreline.
5. Analysis of headland in Reach 7 and how it affects alongshore sediment transport along Reach 6.
6. Utilization of sediment budget and volume changes as part of developing and assessing alternatives, specifically, beach fill designs and predicting Future with Project (FWP) and FWOP conditions.
7. Figure(s) to depict the sediment budgets for each individual reach.
Final Panel Comment 3:

Railroad Reach Conversion Criterion assumptions and values are not substantiated or consistent.

Basis for Comment:

Through application of the Railroad Reach Conversion Criterion, the selection and justification of the Tentatively Recommended Plan is based, in part, upon the assumption that there will be an “inherent delay between a [SCRRA] capital improvement decision and the actual implementation (construction) of a project” (page 58 of the Coastal Engineering Appendix). While such a scenario may exist, insufficient details and substantiation are provided in the report to determine if the assumptions and values therein are accurate.

The “inherent delay” in seawall conversion is represented with a uniform range of a seawall conversion criterion. The selected range for the criterion is not justified or supported by quantitative information or analyses. The sensitivity of plan formulation and plan justification to variations in the criterion values is not tested.

Also, values for the seawall conversion criterion distribution vary throughout the report. On pages 57 and 58 (Coastal Engineering Appendix) it states “The seawall conversion criterion used in the present study is a uniform distribution ranging from 29% to 48%...” The range of this criterion is listed as 33% to 52% on page 63 of the Engineering Appendix. The reason that various ranges for the seawall conversion criterion appear in the report is not explained.

The report also does not recognize that a funding delay situation similar to that modeled for the Southern California Regional Railroad Authority (SCRRA) could occur in the future for the USACE and the Project Sponsor (City of San Clemente) for the implementation of future beach renourishment projects. If the scheduled renourishment does not occur on time, there would be an increased potential for Future with Project damages to upland infrastructure. The life-cycle model used in the study (pages 54 through 63 of the Coastal Engineering Appendix) is not consistent because it does not represent the uncertainties associated with USACE beach renourishment funding and implementation.

Significance – High:
The Railroad Reach Conversion Criterion and representation of the effects of potential Federal and Project Sponsor funding delays is central to the evaluation of project alternatives, plan selection, and plan justification.

Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. Quantitative justification for the selection of the range of values applied for the seawall conversion criterion, and/or an analysis of the sensitivity of plan selection/justification to the range of values applied for the seawall conversion criterion.
2. An explanation for why the report includes several different criterion ranges. A discussion of whether the range was varied to calibrate the model or manipulate the model output.
3. A funding/implementation “delay model” that represents the uncertainties associated with availability and timing of Federal and local funding for shore protection projects.
This is necessary for consistency with the SCRRRA funding delay assumption.
**Final Panel Comment 4:**

<table>
<thead>
<tr>
<th>There are significant uncertainties associated with the selected value of the Minimum Beach Criterion that are not considered in the project alternatives evaluation and plan formulation analyses.</th>
</tr>
</thead>
</table>

**Basis for Comment:**

The Minimum Beach Criterion, which serves as the trigger in the Railroad Reach Conversion Criterion, is a key parameter used to compute storm damages in the San Clemente feasibility study.

The value selected to represent the Minimum Beach Criterion is based upon unverified and unsubstantiated storm-induced beach change data and assumptions that have not been proven in the report to represent conditions along the San Clemente shoreline. The report states “The minimum beach criterion used in the present study is fixed at 8 m (26 ft) and is derived for the 100-yr value for storm induced erosion” (page 57 of the Coastal Engineering Appendix).

Uncertainties associated with the Minimum Beach Criterion value are not quantified or incorporated in the study analyses.

Damages to the rail line, which are based upon the use of the Minimum Beach Criterion, contribute to approximately 90 percent of the total storm damages used to justify the Tentatively Recommended Plan. Slight variations in the value of the Railroad Conversion Criterion and/or consideration of the inherent uncertainties associated with the selected value could significantly affect plan formulation, selection, and justification.

**Significance – High:**

Accurate representation of the Minimum Beach Criterion value and applicable uncertainties is critical for the proper formulation and justification of the project.

**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. Verification and more complete validation of the selected Minimum Beach Criterion value through additional/alternative data and/or analyses.
2. Quantification of the amount of uncertainty associated with the selected Minimum Beach Criterion value.
3. Incorporation of the quantified values of uncertainty associated with the Minimum Beach Criterion into the project alternative evaluation and plan formulation analyses.
Final Panel Comment 5:

The use of the San Diego Association of Governments (SANDAG) project to predict the performance of the San Clemente project has not been justified.

Basis for Comment:

While it can be acceptable practice to consider the performance history of a beach restoration project in close proximity to a proposed restoration site, it must be demonstrated that the two areas are similar in terms of site conditions and project conditions. Similarities between the SANDAG and the San Clemente project sites and project conditions have not been demonstrated.

For the San Clemente Project, the SANDAG regional project performance history is utilized for predicting the FWP shoreline change (erosion rate), determining the renourishment interval, predicting profile equilibration, and estimating potential effects on the nearshore area and surfing. However, sufficient information is not provided regarding similarities between site conditions and project conditions of the two areas. As such, the following project elements need to be addressed.

1. Erosion Rate: Use of the SANDAG regional project to represent the San Clemente FWP shoreline change conditions suggests that the beach will become highly erosional after project construction. As formulated, the median FWP shoreline change rate developed from the SANDAG data suggests that the beach will be 19.5 times (-3.9 m/yr divided by -0.2 m/yr) more erosional than the FWOP rate of -0.2 m/yr (see Page 23). If the borrow area sediments are generally compatible with the native sediments as stated within the report, and background erosion and profile equilibration are properly accounted for in the beach fill design template (which is uncertain, as discussed in a separate Final Panel Comment), then the FWP erosion rate should be more similar to the FWOP erosion rate. Justification for a 19.5-times increase in the FWP erosion rate has not been made and is not consistent with climate and geotechnical information provided in the report.

2. Renourishment Interval: For the design renourishment cycle of 6 years and FWP erosion rate of 3.9 m/yr, the required level of advanced fill (i.e., sacrificial beach width) should equal 23.4 m (6 years times 3.9 m/yr). It is not clear that the beach fill alternatives were formulated to account for this FWP erosion rate [Main Report Chapter 4]. For the Tentatively Recommended Plan (15 m width), only 8 m was added, seemingly to account for the design overfill ratio and profile equilibration. Thus the recommended 15 m beach fill alternative may only have a 3.8 year design life (15 m divided by 3.9 m/yr).

3. Project Impacts: Use of the SANDAG beach fill profile changes to estimate the potential effects of the San Clemente project on the nearshore area and surfing are not adequately substantiated.

Significance – High:

Similarities between the SANDAG project site and the San Clemente site are important to conclusively establish because the performance of the San Clemente project (e.g., erosion rate, renourishment interval, and impacts) is based on these stated similarities.
**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. Detailed comparisons of the similarities between site conditions (wave climate, shoreline conditions, natural erosion rates, native beach conditions, native sediment conditions, sediment budget, and geological controls) and project conditions (berm height, depth of closure, berm width, fill volume density, proposed borrow area sediment conditions, borrow area sediment compatibility) to justify the use of the SANDAG project; and detailed justification for an assumed 19.5-times increase in the FWP erosion rate compared to the assumed FWOP conditions; or

2. In absence of these comparisons, plan formulation (beach fill design templates, renourishment intervals, extent of nearshore rock coverage, and impacts to surfing) should be accomplished utilizing an alternate method, e.g., by applying the updated and refined sediment budget and volume change analysis for Reach 6, as described in a separate Final Panel Comment.
Final Panel Comment 6:

The values used to represent expected storm-induced cross-shore sand transport and beach change have not been verified to site-specific conditions.

Basis for Comment:

For a project site, it may appropriate to use storm-induced beach change data that are derived from observations and/or predictions made at another site that has geographic, oceanographic, and morphological similarities. Data from an alternate site that is geographically and morphologically different should not be used unless it can be definitively determined and verified that the data, or alterations thereto, are applicable to the proposed project site.

1. The values used to represent expected storm-induced cross-shore sand transport values are based upon (a) documented conditions from a different site that is acknowledged to be morphologically different from the San Clemente site, and (b) unsubstantiated linear adjustments based solely on engineering judgment.

2. Specific information or analyses that quantify similarities/differences between the two sites are not presented.

3. Storm-induced beach change data from northern Orange County (e.g. Orange County Beach Erosion Control Project, Surfside-Sunset) were modified for application to present conditions in San Clemente based on a linear relationship and scale of modification derived from “engineering judgment.” Given the apparent significant morphological differences between the two sites and the complexities in the physical processes being represented, use of a linear relationship is likely a gross over simplification of the differences between storm-induced beach changes at the two locations.

4. Specific site measurements, research, comparison to other methods such as SBEACH, other experiences, sensitivity analyses, etc., that could possibly support/validate the use of the northern Orange County data and adjustments thereto are not presented. Also, the “expected San Clemente shoreline response,” upon which the decision to modify the Orange County data are based (Page 27), is not described in the report.

5. No reference is made to Larson and Kraus (2000) and the version of SBEACH that was specifically developed to simulate storm-induced beach change conditions along areas that have rock within and/or adjacent to the sand beach. The statement that SBEACH or other cross-shore sediment transport models are not applicable for representing storm-induced sand transport beach change at the San Clemente site has not been proven. This version of SBEACH has been used extensively for Federal Projects in southeast Florida (e.g., Palm Beach County, Broward County, Martin County) to estimate storm-induced response, storm damage, and storm damage reduction benefits of the upper beach profile. From the information provided in the report, it seems that the sand/rock conditions along the San Clemente shoreline are similar to those conditions in southeast Florida.

6. Sand thickness conditions across the beach profile and storm-induced beach changes will be substantially different without and with the project. This difference in beach conditions is not specifically discussed or considered in FWP shore-induced beach change conditions.

7. There is no basis for the selection of the lognormal distribution to represent the storm-induced beach erosion sample data set. The sensitivity of alternative evaluations and plan selection to various distributions and distribution parameters is not tested.
8. There is no discussion or consideration of uncertainties associated with the selected values of storm-induced beach change.

**Significance – High:**

The values of storm-induced beach change are central to the computation of FWP and FWOP damages, project alternative evaluation, and selection of the Recommended Plan.

**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. Specific details of the similarities/differences between beaches in northern Orange County (Surfside-Sunset) and San Clemente.
2. Justification/validation for the use of a linear adjustment of the northern Orange County data to represent conditions in San Clemente.
3. A graphic presentation of profile data of beach sand and rock conditions to demonstrate the structure of the beach that is not a “sand beach.”
4. More specific explanation of why it is assumed that following beach renourishment, the beach will not be a “sand beach.”
5. A more complete reason/discussion for not using or testing the more traditional method of determining expected storm-induced beach change with a model such as SBEACH.
6. Quantification of the level of uncertainty associated with the storm-induced beach change values.
7. The quantified uncertainty associated with storm-induced beach change values in the project alternative evaluation and plan selection analyses.

**Literature Cited:**

**Final Panel Comment 7:**

Details on sediment compatibility and relationship of depth to closure need to be added to the equilibrium beach profile, toe of fill, and rock coverage analyses.

**Basis for Comment:**

Predicting beach profile equilibration and the resultant toe of fill migration and corresponding nearshore rock coverage / habitat impacts are key elements of the project design. There are several customary methods for predicting the equilibrium beach profile including, but not limited to, utilizing the performance history of a beach restoration project in close proximity to a proposed restoration site, or the profile translation method based upon sediment compatibility and depth of closure. The report does not include a detailed analysis of the potential seaward advancement of the equilibrium toe of fill and corresponding nearshore rock coverage / habitat impacts. In addition to the issues with using the SANDAG project to predict the performance of the San Clemente project (as discussed in a separate Final Panel Comment), the following project elements need to be addressed.

1. The report infers that the profile translation method was utilized [Coastal Engineering Appendix (pg 70)]. However, review of the typical cross-sections for the various beach fill widths analyzed [Main Report Fig 4-7 (pg 102) through Fig 4-11 (pg 110)] indicates there is a lack of volume balance between the volume eroded above the intersection of the template with the equilibrated profile and the volume below, with the volume below being greater. That is, there is significantly greater volume being “adjusted” in the nearshore than what is shown as being eroded. This is critical as it overestimates the nearshore rock coverage and associated habitat impacts, or it underestimates the volume of additive fill necessary to achieve the design. Either way, it affects the benefit/cost (B/C) ratios of the various beach fill alternatives evaluated in the study.

Sediment grain size – including the finer-grained borrow sediments and their compatibility with the native sediments, sediment size variability, and relationship to depth of closure – do not appear to have been incorporated into the profile translation method. For example, the top layer of Borrow Area 2A has a significantly greater percent fines than the native beach and may not perform similar to the existing profile.

2. Given the volume of beach fill proposed and design fill dimensions, the Panel independently calculated the likely depth of closure of the fill to be about -7.1 meters. As shown on the typical cross section of the recommended plan (15 m width) [Main Report Fig 4-7 (pg 102)] the fill material will not extend below -4 meters following equilibration.

3. Estimation of nearshore rock burial impacts does not include the potential for large variations in sediment quality within the borrow area.

4. The construction profile is required for construction purposes because the hydraulic sand placement process cannot place sand across the entire profile in the equilibrated configuration. During construction, sand is placed on the upper portion of the profile and allowed to “equilibrate” through the redistribution of a portion of the sand placed on the upper beach to the
lower areas of the natural beach profile. Through this process, the berm width will decrease from the construction width to the design width. Typically, there is not a significant reduction in the total cross-shore profile volume during this process. There is no explanation regarding expected net volume loss from the profile due to equilibration and what that volume might be.

**Significance – High:**

The B/C ratios may be affected for the beach fill alternatives upon adequate representation of the equilibrated toe of fill and nearshore rock coverage / habitat impacts.

**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. Detailed analysis of the potential seaward advancement of the equilibrium toe of fill and corresponding nearshore rock coverage / habitat impacts incorporating sediment size, depth of closure, and volume balancing.
2. Evaluation of the variations in sediment quality within the borrow area in the estimates of nearshore rock burial and associated habitat impacts.
3. Improved description of the construction profile to explain the net cross-shore volume loss from the beach profile due to equilibration.
Final Panel Comment 8:

The volume-to-area relationship used to derive beach fill volume and expected fill performance is not supported and additional details are needed on specific beach profile characteristics and beach fill design parameters.

Basis for Comment:

The common and accepted industry-wide method for estimating beach volume change and design fill volume is the profile translation and average end area volume summation method. It is not clear why this method was not used or at least tested for this project instead of the described volume-to-area relationship. The noted Southern California engineering practice of volume-to-area relationship to estimate fill quantities is not standard to the industry.

Fill volume/beach width relationship affects the results of the alternatives analysis, plan selection, initial and future fill requirements, and expected impacts to nearshore habitat and resources.

There is not sufficient information given in the report to determine the components or accuracy of the estimated fill volume, expected fill performance, and extent of potential impacts to nearshore areas. Although the berm elevation, berm width, and alongshore length of fill are given, a typical beach profile shape and depth-of-closure (i.e., toe of fill) are not provided.

There is no definition/description of the “design prism,” a parameter upon which the volume is partially based. This is not a standard coastal engineering term and it is not clear from the report what the “design prism” represents.

The report does not state whether the overfill ratio is included in the reported volume needs. An overfill ratio of 1.10 is cited in the Geotechnical Appendix, but the report does not describe how this was used in the development of the required fill volume.

It is also unclear how the background erosion from the date of the design survey (2002) to the projected date of construction (2011 and beyond) is addressed in the proposed fill volume. These two factors will increase the sand volume needs. Thus the volume of sediment available compared to the volume needed is in question.

The relationship between in-place stability and fill quantity is not characterized. There is no discussion about the estimated textural differences between native and existing sediments and the relation to expected fill performance.

It is suggested that the beach is very unique due to the presence of rock across and beneath the beach profile and the geologic controls associated with the rock. Thus, it is unclear how a method based upon “usual and customary” practices can be used to estimate required fill volumes at the San Clemente site.

Significance – High:

An accurate estimate of the fill volume required for a given desired beach width is essential for successful plan formulation.
Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. Estimated fill volume using site-specific beach profile conditions, shapes, and change conditions and a profile translation/average end area method.
2. A comparative analysis of the volume results developed with the volume/area relationship and profile translation/average end area analysis.
3. Description of estimated fill component volumes: design beach fill, advance fill, and overfill.
4. Definition of “design prism.”
5. Discussion of how the overfill ratio was applied to develop the proposed fill volume.
6. Explanation of how the in-place stability of the beach fill is related to fill volume rather than differences in sediment characteristics.
7. Performance predictions that consider the background erosion rate and expected changes to beach sediment conditions due to the placement of the proposed fill material.
### Final Panel Comment 9:

**The significance of the loss of surfgrass and kelp bed communities should be defined.**

#### Basis for Comment:

Surfgrass is an important seagrass community in southern California as it provides habitat for fish breeding and foraging and has been documented as habitat for the spiny lobster (Engle, 1979). Maps in the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) show surfgrass growing on boulders off-shore of the beach nourishment project and the report identifies potential indirect impact to the species associated with sand burial. Although some loss of habitat was determined to be probable due to partial burial of surfgrass, the report determined it was not a “significant loss” of surfgrass. This analysis is based on a single observation of burial of surfgrass during the field survey for this project and a short term laboratory study by Craig et al. (2008) cited in the report [Note: the full citation for this study is missing from the reference list]. The latter report documented that burial does lead to increased mortality and reduced growth. While some beach nourishment monitoring data has shown that surfgrass can withstand long-term burial (AMEC, 2003), the potential depth and length of the burial period for the surfgrass areas identified by this project have not been clearly defined in the report. To address the uncertainties associated with burial, a mitigation monitoring program has been recommended in the report and, if surfgrass does not recover, no further beach renourishment would occur until the surfgrass recovered or some other mitigation action is completed. However, the terms “adverse significant impacts,” “substantial amount,” “substantial damage,” or “long-term loss” are used interchangeably in this section of the report and have not been defined. Therefore, it is not possible to determine when and if further actions are required to mitigate for surfgrass losses. Similar terminology is used for impacts to kelp beds.

#### Significance – Medium:

The inability to quantify the potential impact to surfgrass and kelp beds could lead to unclear mitigation options and tenuous decisions about whether renourishment can occur.

#### Recommendations for Resolution:

To resolve these concerns, the EIS/EIR would need to include the following:

1. Consistent terminology to describe the impacts associated with the project on surfgrass and kelp beds.
2. A quantification of the level of impact that is considered to be an “adverse significant impact” to the local surfgrass population.
3. A clear description of the action levels associated with an “adverse significant impact.”

#### Literature Cited:


Final Panel Comment 10:

<table>
<thead>
<tr>
<th>The description of each planning reach should include information on the reach’s economic, environmental, socio-demographic, and engineering characteristics, and the rationale for the elimination of specific reaches needs to be better described.</th>
</tr>
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<tbody>
<tr>
<td><strong>Basis for Comment:</strong></td>
</tr>
</tbody>
</table>
| According to ER 1105-2-100, Section 3-4, planning reaches should be delineated based on geomorphic conditions, socio-demographic characteristics, and land uses as well as the type or level of existing protection. A thorough analysis of multiple factors should be conducted to establish a strong justification for selecting one reach above all others. However, the report seems to focus primarily on the degree of protection afforded by the existing revetment. Elsewhere, the report states that beach erosion has been triggered by basin-wide development, strongly suggesting that this should also be described for each reach. 

Lastly, political or institutional considerations can affect reach delineation and selection decisions, but the report does not discuss whether political or institutional considerations were addressed. |
| **Significance – Medium:** |
| This affects the completeness or understanding of the report, as it is not clear that the process of delineating the planning reaches included all relevant or influential criteria. |
| **Recommendations for Resolution:** |
| To resolve these concerns, the report would need to include the following:  
1. A description of the delineation of each reach in a manner consistent with ER 1105-2-100, Section 3-4, with respect to the criteria listed in paragraph (c) on page 3-22.  
2. A thorough documentation of any other criteria used to select or exclude beach reaches from analysis.  
3. A statement regarding if one or more of the reaches are ineligible for federal participation or non-federal cost sharing. |

**Literature Cited:**

<table>
<thead>
<tr>
<th>Final Panel Comment 11:</th>
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</thead>
<tbody>
<tr>
<td>Based on the information provided, it is not evident that a sufficient level of public involvement took place.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Basis for Comment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public involvement during plan formulation and implementation is important due to the San Clemente project’s potential impact on the surfing community, beach users, and other stakeholders. The public involvement activities are not described in enough detail and the Panel has concerns that the public involvement process was not thoroughly conducted. A thorough public participation process that involves input from interested parties is necessary to properly incorporate public views and concerns into the decision-making process.</td>
</tr>
</tbody>
</table>

This list of public concerns that is provided appears to be based on one workshop held approximately eight years ago. No other documentation is provided on subsequent public hearings or actions where the public would have had input to the planning process. The details of the one reported event are not made clear, but feedback from the 2002 workshop is not likely to reflect the full range of current public concerns. Furthermore, there is no stated procedure for objectively gathering data on potential support for or opposition to the proposed project. Specific details regarding public concerns related to projects for specific reaches are missing from the report. It is typical for a project of this nature to obtain public input early, often, and ongoing throughout the decision-making process, but it is not possible to ascertain the degree to which public concerns have been addressed. |

<table>
<thead>
<tr>
<th>Significance – Medium:</th>
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<tbody>
<tr>
<td>The San Clemente Feasibility Study must describe recent outreach processes to indicate that there have been sufficient attempts to engage the public.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommendations for Resolution:</th>
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<tbody>
<tr>
<td>To resolve these concerns, the report would need to include the following:</td>
</tr>
<tr>
<td>1. A more detailed and thorough description of the public involvement process to date.</td>
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<tr>
<td>2. An account of more recent activities to incorporate stakeholder interests and concerns.</td>
</tr>
<tr>
<td>3. A more formal stakeholder analysis detailing specific interests and positions.</td>
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<tr>
<td>4. More diverse and varied ways to understand and incorporate public views into the decision-making process.</td>
</tr>
<tr>
<td>5. More opportunities for key stakeholders and other interested parties to express their concerns related to the proposed project.</td>
</tr>
</tbody>
</table>
## Final Panel Comment 12:

**Cost effectiveness and not cost should be used for screening the measures.**

### Basis for Comment:

ER1105-2-100 (USACE, 2000) describes USACE’s planning guidance for formulating each alternative on the basis of four evaluation criteria. The one criterion related to cost is “efficiency,” defined as the extent to which an alternative plan is the most cost-effective means of achieving the objectives. The guidance does provide for abbreviating steps in the procedures provided that the steps that were abbreviated and the reasons for the abbreviations are documented in the report.

Alternatives that consider structural measures to compliment beach fills were screened out, in part, on the basis of extremely high cost and not on cost effectiveness (e.g., visible breakwaters – Main Report pg. 77; submerged breakwaters – Main Report pg. 78; seawalls – Main Report pg. 80; and revetments – Main Report pg. 81). No cost data were presented to document this abbreviated analysis.

### Significance – Medium:

While it may not affect selection of the Tentatively Recommended Plan, the abbreviated steps and rationale for abbreviating the steps for evaluating structural measures should be provided.

### Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. Benefits and costs (B/C) ratios for the alternatives that consider structural measures to compliment beach fills and application of these B/C ratios in the formulation and screening process; or
2. Documentation of extremely high costs to substantiate the abbreviated analysis.

### Literature Cited:

Final Panel Comment 13:

More thorough documentation and analysis is needed on management measures to justify the selection of the alternative.

Basis for Comment:

Management measures are defined in the Feasibility Report as “screening alternatives.” Two steps were taken—a first screening of Preliminary Measures followed by a separate screening step taken to reach a final array of measures. The Feasibility Report lists a number of criteria: four “formulation criteria” on page 70, planning constraints in Section 4.5, and then screening criteria on page 82. However, a discussion on how they are applied to various stages of the development and screening of Preliminary Measures is lacking.

Non-structural and structural alternatives and some of their advantages and disadvantages are discussed; however, there is no explicit statement within the description of each management measure as to why it did not meet the four environmental evaluation criteria (which are different than the four formulation criteria) in Table 4-1. For example, it is not clear why managed retreat is not environmentally acceptable or why groins are not technically feasible, as neither are discussed in the text nor the limited paragraphs on page 82. The report does not conclusively show that the “managed retreat,” exclusive of the rail line relocation, is not more cost effective than beach nourishment. The only public opposition cited in the report is the concerns by the Surfriders over potential changes in the T-Street surf conditions, not other public concerns were specified, though it as a reason to eliminate structural alternatives. Public opposition to these alternatives needs to be documented and explained more thoroughly. The environmental acceptability of alternatives appears to be solely based on expected Coastal Commission staff opinion rather than a true evaluation of environmental impacts. There may be other reasons to eliminate specific alternatives that are not discussed such as potential impacts of visible breakwaters or groins to Essential Fish Habitat and public safety issues associated with revetments and seawalls.

There is inconsistency between Table 4-1 in the Feasibility Study and Table 3-1 in the EIS/EIR. Beach fill was found to be environmentally and publicly acceptable in the EIS/EIR, but was listed as ‘maybe’ for those two categories in the Feasibility Study.

The final screening process examines various beach fill alternatives. Twelve beach fill widths are considered and analyzed. The screening process is specific to which beach fill width produces the highest benefit/cost (B/C) ratio. However, the description of the modeling and results is very limited.

Significance – Medium:

Without greater clarity as to the screening process, the basis for the selection of the Tentatively Recommended Plan cannot be understood.

Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. Revision of the report so that the text clearly demonstrates that storm damage reduction is the primary focus of the plan formulation and design.

2. More detailed information on environmental and public safety reasons to justify the
elimination of potentially feasible management measures.
3. A correction to the inconsistency between the conclusions reached in Table 4-1 and Table 3-1.
4. A full description of the modeling used in the final screening process that addresses beach fill alternatives.
## Final Panel Comment 14:

**More detailed examination of the impacts of future sea level rise on the project is warranted.**

### Basis for Comment:

The basis for this comment is found in ER 1105-2-100, Appendix E and California Coastal Conservancy and Executive Order S-13-08.

The State Coastal Conservancy has recommended that consistent with Executive Order S-13-08, the Conservancy will consider the following sea level rise scenarios in assessing project vulnerability and, to the extent feasible, reducing expected risks and increasing resiliency to sea level rise:

- a. 16 inches (40 cm) by 2050.
- b. 55 inches (140 cm) by 2100.

The Feasibility Study evaluation of sea level rise appears to be limited to the effect of water level increases upon the landward encroachment of storm impacts. No evidence is presented that sea level rise has been considered in the development of the required project fill volume and attendant increases (if any) in beach height that could slow or mitigate the landward migration of storm impacts. If plan selection is sensitive to sea level rise, the sensitivity analysis should be conducted on the entire array of alternatives rather than on the NED plan only.

### Significance – Medium:

Sea level rise is likely to have a proportional impact on both the costs and benefits of the Tentatively Recommended Plan and, therefore, affects the understanding of the report.

### Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. Documentation that the report has addressed the risks discussed in S-13-08.
2. Documentation that the selected plan design volumes properly address both beach width and beach height with respect to resiliency to sea level rise.
3. Documentation that plan selection is not sensitive to sea level rise considerations, or inclusion of a sensitivity analysis that addresses the Appendix E guidance.
Final Panel Comment 15:

**Impacts of the project to the local community are not described in detail sufficient to provide a clear and accurate representation of the current conditions in the study area.**

**Basis for Comment:**

The impacts of the proposed project on the community are not consistently based on accurate and area-specific information. For example, population projections for 2025 listed for San Clemente in Table 2-13 have already been surpassed. More up-to-date demographic figures would provide a more accurate picture of the degree to which local populations will be affected. Also, in Section 2.9.2, information provided in the text for population and income is not consistent with Tables 2-13 and 2-15.

The connection between future beach attendance and population growth must be further developed and rely on the most accurate data available. It is assumed that beach attendance will mirror population growth even though historical attendance has exceeded this rate. Also, actual impacts to the surrounding population (Section 4.9.2) are not made clear. Indirect construction effects and how they will be mitigated are not thoroughly described. Finally, public health and safety issues are mentioned only vaguely.

The description of the “temporary impacts” to recreational areas lacks detail. Even though construction will take place off-season, a legitimate estimation of recreational impacts should be given and a discussion of the impacts of beach closure during construction should be given.

Information on parcel-level land use and land use change surrounding Reach 6 is not included in the report. Specific parcels and households affected by the project should be identified, mapped, and specific mitigation procedures should be described.

Finally, the discussion under the community cohesion heading in Section 4.9.2 needs to be rethought. There is substantial literature (See, for example, Buckner, 1988; Robinson, 2005; Cantle, 2005; Wetherell et al., eds. 2007) on this topic that should be reviewed. Community cohesion is much more than a sense of belonging to a neighborhood.

**Significance – Medium:**

A thorough understanding of the local community is essential to effectively mitigate the project’s potential adverse impacts.

**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. More spatially-specific socioeconomic and demographic information surrounding the proposed project site.
2. A more detailed analysis of the potential direct and indirect impacts from construction on surrounding populations.
3. A justification for why future beach attendance will mirror population growth when historical attendance has exceeded that rate.
4. Identification of specific parcels and households that may be affected by the proposed project.
5. A more thorough description and background on what is meant by community cohesion.
and the factors contributing to its formation.

**Literature Cited:**


**Final Panel Comment 16:**

The cost analysis assumptions are reasonable; however, the mobilization/demobilization costs and the estimate of contingencies should be revised to reflect equipment availability, travel times, and production capacity.

**Basis for Comment:**

Given the distance between the beach fill area and borrow site (>18 miles), construction by hopper dredge is likely the most feasible dredging option, although there are alternate construction methods not considered in the report. There are a wide range of hopper dredge sizes in the U.S. dredge fleet, each with differing haul capacity, speed, and production rates.

As to the Risk Analysis and Contingency Analyses, it is customary to follow the USACE Cost Center of Expertise’s 2008 Cost & Schedule Risk Analysis Process (USACE, 2008), a multi-step process wherein a matrix of many variables (several dozen) is established that are reviewed for cost and schedule implications. The high-risk-level variables are carried forward for additional analysis, and then narrowed into the Final Risk Register. This multi-step process is not well documented in the report.

Based upon the Panel’s experience, the contingencies presented equal to 18% for sand costs and 13% for Mob-Demob are quite low, especially for the quoted 90% (high) confidence level. Generally at the Feasibility Study level, it is the Panel’s experience that these contingencies range from 22%-27%. The following variables, if included in the Initial Risk Register, should have remained in the Final Risk Register: Dredge Availability, Transiting Panama Canal, Funding Availability at Renourishment Interval (Local Sponsor and Feds), Behavior of Fill, and Impacts to Nearshore Rock. Also, the assumption of 90% effective work time for the selected dredge size/type is not realistic based on the Panel’s experience with designing and managing construction of similar beach restoration projects, and reevaluation is warranted.

To ensure the cost analysis information is clearly presented, please note these additional comments on a variety of inconsistencies between the Main Report and the Cost Engineering Appendix:

- Costs presented in the Executive Summary (Table on pg. ix) do not match costs in the Appendix; these include Initial Construction Total/Sand/Mob-Demob, Total Life Cycle, and Annual.
- Dredge *Yaquina* (pg. 85) used for basis of analysis cited in the Main Report, while dredge *Sugar Island* is cited in the Appendix (pg. 3). Based on the Panel’s knowledge, *Yaquina’s* capacity and production capabilities are significantly less than *Sugar Island’s*.
- Throughout the Report and Appendix the mileage from the fill site to the borrow area is cited as both 18.6 miles and 21 miles. It is unclear which is the correct distance. It is also unclear if the mileage is presented as statute miles or nautical miles.
- Sail distance from New Orleans to San Clemente is approximately 5,060 nautical miles as measured by the Panel. The Report and Appendix cite this distance as 4,300 miles (again, it is unclear if these are statute or nautical miles).

**Significance – Medium:**

The Total Project Cost will be affected by improving the mob/demob cost estimate and improving the estimate of contingencies to more accurately reflect the risks and uncertainties.
**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. Evaluation of a range of hopper dredge sizes and expected production capabilities in the development of the cost estimate and contingencies.
2. Evaluation of alternate construction methods including:
   a. hydraulic dredging, spider barge scow loading, scow towing and scow offloading at receiver beach, or
   b. borrow area dredging with hopper dredge, construction of temporary sand berm on seafloor seaward of receiver beach, and subsequent hydraulic dredge of sand berm and fill construction at receiver beach.
4. Reassessment of the Final Risk Register to include Dredge Availability, Transiting Panama Canal, Funding Availability at Renourishment Interval (Local Sponsor and Feds), Behavior of Fill, Impacts to Nearshore Rock, Effective Work Time.
5. Addressing the comments / fixing the inconsistencies identified in the basis for comment.

**Literature Cited:**

**Final Panel Comment 17:**

It is not clear whether Borrow Area 2A can satisfy the project’s 50-year needs.

**Basis for Comment:**

For the Tentatively Recommended Plan, the Main Report states the total sand needs for the 50-year period of analysis is ~2.26 million cubic yards (MCY). It should be noted that the Panel computed ~2.1 MCY using the quantities provided in the Cost Appendix (measured on the cut). From the Geotechnical Appendix, Borrow Area (BA) 2 contains ~20.5 MCY based on a 15 ft cut depth. A selective design within the BA denoted as BA 2A was performed limiting the surface area to the higher quality sediments and shallowing the cut to 10 ft, yielding an available volume of ~2.13 MCY. This is slightly less than a 1:1 ratio of volume available to volume needed. Thus the volume of sediment available in BA 2A compared to the volume needed is in question.

The Geotechnical Appendix recommends a cut depth of 15 ft to mix the sediments as the top layer has high silt content (average of 35%) and the body of sediment contains lenses of cobbles/gravel throughout. The Geotechnical Appendix also recommends use of hydraulic or mechanical dredges instead of hopper dredge to achieve this mix. Thus the quality of sediment in BA 2 is in question assuming BA 2A has to expand to accommodate the increased volume need stated above.

Due to the inconsistencies among the Main Report, Cost Appendix, and Geotechnical Appendix specific to fill volume, uncertainty of the quality of the sediment available in BA 2 outside the limits of BA 2A, and unsubstantiated overfill and background erosion needs, the Panel cannot determine if the single BA (BA 2A) dredged by the selected hopper size/type is sufficient to satisfy the project’s 50-year needs.

Additionally, the clarity of the Geotechnical Appendix would be improved by addressing the following issues:

- Specific compatibility analyses for BA 2A and the BA 2 sediments beyond the limits of BA 2A are not provided.
- The Geotechnical Appendix cites a volume requirement on four beach fill sites equal to 300,000 cy/yr over 5 years (1.5 MCY total), which is inconsistent with the rest of the report.
- Hopper dredge was selected for the project despite the recommendation in the Geotechnical Appendix to use alternate methods to blend the sediments to achieve compatibility.

**Significance – Medium:**

A borrow area design must be provided that satisfies the 50-year project needs; otherwise it could affect the selection of the recommended plan.

**Recommendations for Resolution**

To resolve these concerns, the report would need to include the following:

1. Accurate and consistent definition of the fill volume needed.
2. Improved design volume calculations, expected fill equilibration analysis, and long-term performance analysis to account for variations in sediment quality and background.
erosion.

3. Expanded BA 2A design, considering poorer quality sediments beyond BA 2A, to provide the necessary volume of beach compatible sand to satisfy the project requirements for the 50 year period of analysis. It is customary to include 50% to 100% more of the volume needs to account for hopper dredge inefficiencies and borrow area geometry.

4. Specific overfill analysis of Borrow Area 2A sediments.

5. Address the comments / fix the inconsistencies identified in the basis for comment above.
Final Panel Comment 18:

Since the coastal storm damage model does not appear to have been certified, then the model itself and particularly the key random variables need to be described in considerably more detail, and evidence of model certification should be provided.

Basis for Comment:
The basis for this comment is found in EC 1105-2-407. Use of certified models for all planning activities is mandatory. There is no evidence found in the report to demonstrate that the coastal storm damage model has been submitted to the Hurricane and Storm Damage Reduction Planning Center of Expertise (PCX) for certification in accordance with the protocols established in the guidance. Furthermore, the report’s justification for not selecting a certified model is insufficient.

Additionally, neither the Feasibility Report nor the Economics Appendix thoroughly document the assumptions, constraints, theory, logic or scientific validity of the coastal storm damage model, and the model’s key random variables and distributions are not described. This lack of information prevents the model results from being duplicated.

Significance – Medium:
Documenting that the model has been certified or not would address any uncertainty in the report

Recommendations for Resolution:
To resolve these concerns, the report would need to include the following:
1. Documentation that the model is certified or is currently undergoing review for certification by the PCX.
2. Complete documentation of the model, along with key variables, distributions and logic so that results can be duplicated.

Literature Cited:

**Final Panel Comment 19:**

It is not clear how the effects of loose rock and cobble in the San Clemente beach profile affect beach dynamics and expected project performance.

**Basis for Comment:**

The presence, prevalence, and variability of loose rock and cobble within the beach can affect beach change conditions, profile shape, and beach stability.

The effects of loose rock and cobble in the San Clemente Beach are not adequately considered in the report. Specifically, there is no discussion that changes in beach shape and slope due to the presence and variability of loose rock and cobble in the beach has been considered in the evaluation of seasonal and/or long-term changes and overall beach stability.

The report is also vague with regard to how the amount of loose rock and cobble in the beach may change due to the construction of the beach fill, and how any changes in the amount of loose rock and cobble may affect future beach slope and shape and expected beach fill performance.

The presence of loose rock and cobble can affect beach shape, slope and change conditions across the beach profile. These changes may not be accurately represented by simply describing beach conditions and beach changes conditions with one representative shoreline elevation.

**Significance – Medium:**

A better description of how the loose rock and cobble are incorporated into site conditions and the plan formulation process is necessary to make the report more complete.

**Recommendations for Resolution:**

To resolve these concerns, the report would need to include the following:

1. A discussion or analysis of the effect of loose rock and cobble upon existing beach change conditions.
2. A discussion of how the effect of loose rock and cobble has been incorporated into evaluation of site conditions and plan formulation.
3. A discussion or analysis of how the loose rock and cobble content of the beach may be altered by the construction of the beach fill and how any changes to the content may affect beach conditions and expected beach fill performance.
## Final Panel Comment 20:

Some elements of project monitoring are missing and an adaptive management plan needs to be developed.

### Basis for Comment:

Several aspects of monitoring both during and after project implementation are missing from the feasibility report. Specifically, more detail is needed on the timeline and frequency of monitoring associated with construction progress, socioeconomic impacts, environmental conditions, etc. For example, Table 7-1 does not provide any description of post-project monitoring of off-shore surfgrass and kelp beds which is necessary to ascertain project impacts on these critical ecological features and ensure full recovery is achieved. Identification of specific time periods for project monitoring would enhance project implementation.

Also, a description of an adaptive management process is missing from the feasibility report. Given the changing nature of environmental and socio-demographic conditions, the ability to adapt to new information is essential to the project’s success. Procedures should be outlined as to how the project can respond to new data or events (such as a major storm that accelerates the erosion process beyond initial expectations). Alternative courses of action need to be delineated in the event project objectives are not met or new information becomes available.

### Significance – Medium:

Details on the monitoring of environmental conditions and project implementation are needed to better understand how the project success will be monitored and project objectives will be achieved.

### Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. A specific Management Plan detailing the timeline and regularity of monitoring construction progress.
2. Establishment of a monitoring program for surfgrass and kelp beds during and subsequent to the proposed project.
3. Establishment of procedures and processes to learn from and adjust to new information generated from monitoring activities.
Final Panel Comment 21:

The effects of borrow area sediment quality variation on water quality, project constructability, and project performance could be different than those discussed in the report.

Basis for Comment:

Regions of sediments within a borrow area with high silt contents can generate excessive turbidity levels during dredging and may not be mixed well with other sediments when dredged with a hopper dredge. Also, sediments with extremely high silt content can adversely affect dredge production rates, a contractor’s ability to place fill material within a prescribed fill template, and overall project performance.

The silt content within some areas of the upper layers of Borrow Areas 2 and 2A are as high as 40 percent. Typical beach compatible sediments used for beach nourishment have a silt content of 10 percent or less.

On page 16 of the Geotechnical Appendix, it is acknowledged that material within the upper 1 to 2 meters of BA 2 is not beach compatible. It is stated that the overall gradation of the beach fill material derived from this borrow area would be acceptable if the area is dredged to full depth as a unit. This presumably assumes that the non-compatible materials will be mixed with other sediments that are more compatible and the mixing would result in a homogenous mass of acceptable sediments.

Material cannot be excavated from the borrow area as a “unit” using a hopper dredge. Hopper dredges remove material from borrow areas in thin uniform layers which usually are only 1 to 2 feet in thickness. Repeated passes with the hopper dredge are required to dredge deeper areas of the borrow site. Dredge bin capacity would limit any particular area of a borrow site from being dredged through depth in one dredge load and having consistent sediment quality between loads. It may only be possible to dredge through depth using a hydraulic cutter-suction dredge. A hopper dredge is proposed for use in the San Clemente project.

It is not clear how Borrow Area 2 can be used as the proposed borrow source if it is necessary to dredge the borrow area as a “unit” to achieve the required sediment quality for the San Clemente beach fill.

Significance – Medium:

Water quality conditions during construction, project constructability, and project performance can be adversely affected by the variability of sediment conditions within the borrow area and the requirement to excavate the material from the entire borrow area as a “unit.”

Recommendations for Resolution:

To resolve these concerns, the report would need to include the following:

1. A discussion of the potential adverse effects that dredging areas of sediments with high silt content may have upon project constructability, water quality, and project performance if not well mixed with other sediments from the borrow area.
2. A explanation of how it is expected that a hopper dredge can dredge the proposed borrow area materials as a “unit” through depth.
3. Demonstration that the potential adverse effects have been considered in project.
formulation, environmental effect analyses, and project performance estimates.
<table>
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<th>Final Panel Comment 22:</th>
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<tbody>
<tr>
<td><strong>The calibration of railroad damage functions is not clear.</strong></td>
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<tr>
<td><strong>Basis for Comment:</strong></td>
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<tr>
<td>The values assigned to the railroad damage functions ultimately control the amount of damage that is computed for run-up related damages to the rail line. The calibration method used to establish the damage function values is not described in the report (Table 11; Page 47 of the Coastal Engineering Appendix) with regard to the model parameters that were adjusted during calibration or the values against which model results were compared to test the calibration.</td>
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<tr>
<td><strong>Significance – Low:</strong></td>
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<tr>
<td>Clarification of the railroad damage function will improve the technical quality of the report.</td>
</tr>
<tr>
<td><strong>Recommendation for Resolution:</strong></td>
</tr>
<tr>
<td>To resolve these concerns, the report would need to include the following:</td>
</tr>
<tr>
<td>1. A more detailed description of the calibration method used to establish the railroad function values. This should include a discussion of the model parameters that were adjusted during calibration and the values against which model results were compared to test the calibration.</td>
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## Final Panel Comment 23:

There are omissions in the Environmental Impact Statement’s section on Biological Resources (including unclear figures, missing information on surfgrass fauna, and incomplete discussions on shorebirds and sea turtles) that need to be addressed.

### Basis for Comment:

A number of details are missing from the EIS’s Biological Resources section. These details, which are required to better understand the biological issues and impacts, are summarized below:

- **Figure 4.4-1:** A definition or description of the term “lease area” is not provided in this figure. Additionally, the artificial kelp reef enhancement areas that have been established off-shore of San Clemente by Southern California Edison as mitigation for the San Onofre Nuclear Generating Station (SONGS) are not identified in the figure.

- **Page 4-39:** Not enough detail is provided on habitat use by various animals that are often specifically associated with the surfgrass community. The surfgrass community is unique and is an important habitat for species such as the surfgrass limpet (*Notoacmea paleacea*), the aggregating anemone (*Anthopleura elegantissima*), and the turban snails (*Tegula eiseni* and *Tegula funebralis*). In addition, surfgrass communities are important to the juvenile stages of spiny lobster.

- **Page 4-41:** Given the importance of the beach for foraging shorebirds, especially during migration periods, details on beach foraging species and their seasonal patterns are not provided.

- **Page 4-42:** There is no description of the offshore artificial kelp reef created for the SONGS mitigation program, which is increasing the amount of kelp habitat in the vicinity of the San Clemente project.

- **Page 4-47:** Sea turtles are not discussed in this section. They are documented historically in the region, but have not been seen recently. Since they are listed in Table 4-14, the Panel believes that a discussion is warranted.

### Significance – Low:

Additional detail in the Biological Resources section will help improve the technical quality of the report.

### Recommendation(s) for Resolution:

To resolve these concerns, the report would need to include the following:

1. An explanation of the term “lease area” in Figure 4.4-1. It might also be useful to explain the small blocks as shown in the figure as artificial kelp reef enhancement that have been established off-shore of San Clemente by Southern California Edison as mitigation for the San Onofre Nuclear Generating Station. There is a considerable amount of information on this project and because of its uniqueness to the area, it should be described. See the EIR for the Kelp Reef at San Clemente for more information that could be used in this section on the biota of the offshore regions of the project area:
2. A more thorough discussion of the fauna found in surfgrass and their importance to the community is needed on page 4-39.

3. A more thorough discussion of the bird species that forage on the beach is needed along with their seasonal patterns based on common information available for southern California. Please describe any California Department of Fish and Game sensitive bird species that might be expected in this habitat type.

4. A description of the SONGS artificial kelp reef, a recognition that it is a mitigation reef, and an analysis of any effects the San Clemente project might have on it.

5. Some discussion of sea turtles after mammals.
**Final Panel Comment 24:**

**Recreational benefits must be treated as incidental benefits of the project.**

**Basis for Comment:**

Beginning on Page 70, and specifically Section 4.6.2, extraordinary care must be taken to demonstrate that, in formulating the NED plan, recreational benefits are treated as incidental and not used to drive plan formulation and screening of measures at any step. Though later sections of the report and the Economics Appendix demonstrate understanding of this constraint, Sections 4.5 and 4.6 suggest that recreation is a major planning objective, rather than an incidental one.

**Significance – Low:**

This issue represents a minor internal consistency issue that affects the overall technical quality of the report.

**Recommendations for Resolution:**

To resolve these concerns, the report would need to be revised as follows:

1. Ensure that Section 4.5, 4.6, and other portions of the report identify coastal storm damage reduction as the primary planning objective.
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APPENDIX B

Final Charge to the Independent External Peer Review Panel

on the

San Clemente Feasibility Study
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BACKGROUND

The San Clemente Shoreline Feasibility Study area is located along the Pacific Ocean coastline in the City of San Clemente, Orange County, California. San Clemente is the southernmost city in Orange County and is bounded by the Camp Pendleton Marine Base and San Onofre State Beach Park to the south; and to the north, by the communities of Capistrano Shores and Dana Point. The original total study area encompasses the City of San Clemente and extends from San Mateo Point, located at the southern boundary of the City, to Dana Point Harbor for a total distance of approximately 12.1 kilometers (7.5 miles).

The beaches throughout this study area have historically suffered from beach erosion due to storm-induced wave attack, with greatest erosion occurring since the early 90’s. Average beach widths along the City’s shoreline have been gradually reduced, at rates of up to 0.46 m/yr (1.5 ft/yr) during this timeframe. The greatest loss of material has occurred within the 1,370-meter (4,500-foot) stretch of beach from Mariposa Street to Cristobal Street (also known as T-Street). The “T-Street” region of the shoreline is a notoriously popular surfing site located immediately south of San Clemente pier, and directly offshore of the T-Street overpass. The T-Street surf break is due to a permanent, hard bottom reef that rises above the seabed. It has become apparent through the study and through interaction with local conservation agencies (i.e. Surfrider), that the unique surfing characteristics in this area could be altered by modification to or burial of the reef. As a result, mitigation of impacts to the reef has become the largest constraint in the plan formulation process for this study. Other constraints include environmental effects including kelp, seagrass, and shallow water rocky habitat.

Running along the entire length of the San Clemente shoreline is a portion of the Lossan (Los Angeles to San Diego) railroad corridor, which is owned by the Orange County Transportation Authority (OCTA). This commuter rail corridor is among the busiest in the country and separates the beach from the bluff. The study area is divided into ten reaches based on locations of developments and the condition of the revetment that runs along the railroad tracks. After analysis of each section it was determined that only reach 6 of the original ten reaches has the potential for a justified project based on economic analysis. Reach 6 extends from Paseo de Cristobal to Linda Lane in the City and contains beach ranging from 5 to 20 m (16 to 66 ft) in width. The beaches are backed by park facilities, railroad tracks, and high coastal bluffs and include the majority of significant structures along the beach.

The purpose of this study is to identify the most technically feasible and economically beneficial “recommended plan” for reducing shoreline erosion and protecting coastal infrastructure from storm-induced wave attack. The reconnaissance phase of this study was initiated on March 28, 2000 under the authority of Section 208 of the River and Harbor Act of 1965. This phase of the study resulted in the finding that there was a Federal interest in continuing into the feasibility phase. The City of San Clemente, the non-Federal sponsor, and the U.S. Army Corps of
Engineers (USACE) initiated the feasibility phase in September 2001. The feasibility phase study was cost-shared equally between USACE and the sponsor.

OBJECTIVES

The objective of this work is to conduct an independent external peer review (IEPR) of the San Clemente, Orange County, California Feasibility Study (San Clemente Feasibility Study) in accordance with the Department of the Army, U.S. Army Corps of Engineers, Water Resources Policies and Authorities’ Civil Works Review Policy (EC 1165-2-209) dated January 31, 2010 and the Office of Management and Budget’s Final Information Quality Bulletin for Peer Review released December 16, 2004.

Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community. Peer review typically evaluates the clarity of hypotheses, validity of the research design, quality of data collection procedures, robustness of the methods employed, appropriateness of the methods for the hypotheses being tested, extent to which the conclusions follow from the analysis, and strengths and limitations of the overall product.

This purpose of the IEPR is to assess the adequacy and acceptability of economic, engineering, and environmental methods, models, and analyses used for the San Clemente Feasibility Study. The IEPR will be limited to technical review and will not involve policy review. The IEPR will be conducted by subject matter experts (i.e., IEPR panel members) with extensive experience in coastal or civil design/construction cost engineering; civil works planning; National Environmental Policy Act (NEPA)/biology; coastal or civil engineering; and economics issues relevant to the project.

The panel members will be “charged” with responding to specific technical questions as well as providing a broad technical evaluation of the overall project. The panel members will identify, examine, and comment upon the assumptions underlying the analyses as well as evaluate the soundness of models and analytic methods. The panel members will evaluate whether the interpretations of analyses and conclusions are technically sound and reasonable, provide effective review in terms of both usefulness of results and of credibility, and have the flexibility to bring important issues to the attention of decision makers. The panel members may also offer opinions as to whether there are sufficient analyses upon which to base a recommendation.

DOCUMENTS PROVIDED

The following is a list of documents and reference materials that will be provided for the review. The documents and files presented in bold font are those which are to be reviewed. All other documents are provided for reference.

- San Clemente Shoreline Feasibility Study, Orange County, California, Draft Report
  - Main Report
  - Coastal Engineering Appendix
- Cost Engineering Appendix
- Economics Appendix
- Geotechnical Appendix
- Real Estate Appendix

- Draft Joint Environmental Impact Statement/Environmental Impact Report (Volume II--Appendices), San Clemente Shoreline Protection Project
  - Appendix A: Air Quality Analysis Report
  - Appendix B: Coastal Engineering Report
  - Appendix C: Geotechnical Report

- CECW-CP Memorandum dated March 31, 2007
## SCHEDULE

<table>
<thead>
<tr>
<th>TASK</th>
<th>ACTION</th>
<th>DUE DATE</th>
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<tbody>
<tr>
<td><strong>Conduct Peer Review</strong></td>
<td>Review documents sent to panel members</td>
<td>5/13/2010</td>
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<tr>
<td></td>
<td>Battelle/panel Kick-off Meeting</td>
<td>5/14/2010</td>
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<tr>
<td></td>
<td>USACE/Battelle/panel Kick-off Meeting with panel members</td>
<td>5/14/2010</td>
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<td>External panel members complete their review</td>
<td>6/14/2010</td>
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<tr>
<td><strong>Prepare Final Panel Comments and Final IEPR Report</strong></td>
<td>Battelle provides panel members merged individual comments and talking points for panel review teleconference</td>
<td>6/21/2010</td>
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<td></td>
<td>Convene panel review teleconference</td>
<td>6/23/2010</td>
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<td></td>
<td>Battelle provides Final Panel Comments (FPC) directive to panel</td>
<td>6/24/2010</td>
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<td>External panel members provide draft Final Panel Comments (FPCs) to Battelle</td>
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<td></td>
<td>Battelle provides feedback to panel members on draft FPCs; panel provides revised draft FPCs per Battelle feedback</td>
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<td></td>
<td>FPCs finalized</td>
<td>7/9/2010</td>
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<td>Battelle provides Final IEPR report to panel for review</td>
<td>7/13/2010</td>
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<td>Panel provides comments on Final IEPR report</td>
<td>7/15/2010</td>
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<td></td>
<td><em>Submit Final IEPR Report</em></td>
<td>7/20/2010</td>
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<td><strong>Comment/ Response Process</strong></td>
<td>Input FPCs to DrChecks Battelle provides FPC response template to USACE</td>
<td>7/22/2010</td>
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<td>USACE PDT provides draft Evaluator responses and clarifying questions to Battelle</td>
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<td></td>
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<td>Panel members provide Battelle with draft BackCheck responses</td>
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CHARGE FOR PEER REVIEW

Members of this peer review panel are asked to determine whether the technical approach and scientific rationale presented in the San Clemente Storm Damage and Shoreline Protection Feasibility Study are credible and whether the conclusions are valid. The reviewers are asked to determine whether the technical work is adequate, competently performed, properly documented, satisfies established quality requirements, and yields scientifically credible conclusions. The panel is being asked to provide feedback on the economic, engineering, environmental resources, and plan formulation. The reviewers are not being asked whether they would have conducted the work in a similar manner.

Specific questions for the panel members (by report section or Appendix) are included in the general charge guidance, which is provided below.

General Charge Guidance

Please answer the scientific and technical questions listed below and conduct a broad overview of the San Clemente Storm Damage and Shoreline Protection Feasibility Study. Please focus on your areas of expertise and technical knowledge. Even though there are some sections with no questions associated with them, that does not mean that you cannot comment on them. Please feel free to make any relevant and appropriate comment on any of the sections and appendices you were asked to review. In addition, please note the following guidance. Note that the panel will be asked to provide an overall statement related to 2 and 3 below per USACE guidance (EC 1165-2-209; Appendix D).

1. Your response to the charge questions should not be limited to a “yes” or “no.” Please provide complete answers to fully explain your response.

2. Assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, and any biological opinions of the project study.

3. Assess the adequacy and acceptability of the economic analyses, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, and models used in evaluation of economic or environmental impacts of the proposed project.

4. If appropriate, offer opinions as to whether there are sufficient analyses upon which to base a recommendation.

5. Identify, explain, and comment upon assumptions that underlie all the analyses, as well as evaluate the soundness of models, surveys, investigations, and methods.

6. Evaluate whether the interpretations of analysis and the conclusions based on analysis are reasonable

7. Please focus the review on assumptions, data, methods, and models.

Please do not make recommendations on whether a particular alternative should be implemented, or whether you would have conducted the work in a similar manner. Also please...
do not comment on or make recommendations on policy issues and decision making. Comments should be provided based on your professional judgment, not the legality of the document.

- If desired, panel members can contact one another. However, panel members should not contact anyone who is or was involved in the project, prepared the subject documents, or was part of the USACE Agency Technical Review.
- Please contact the Battelle deputy project manager (Corey Wisneski; wisneskic@battelle.org) or project manager (Karen Johnson-Young, johnson-youngk@battelle.org) for requests or additional information.
- In case of media contact, notify the Battelle project manager immediately.
- Your name will appear as one of the panelists in the peer review. Your comments will be included in the Final IEPR Report, but will remain anonymous.

Please submit your comments in electronic form to Corey Wisneski, wisneskic@battelle.org, no later than June 14, 2010, 10 pm ET.
General Questions

1. To what extent has it been shown that the project is technically sound, environmentally acceptable, and economically justified?

2. Are the assumptions that underlie the economic, engineering, and environmental analyses sound?

3. Are the economic, engineering, and environmental methods, models, and analyses used adequate and acceptable?

4. In general terms, are the planning methods sound?

5. Are the interpretations of analysis and conclusions based on the analysis reasonable?

Independent External Peer Review
San Clemente Storm Damage and Shoreline Protection Feasibility Study

Final Charge Questions

Executive Summary

Section 1.0 – Introduction

1.1 Study Authority

No questions

1.2 Purpose and Scope

No questions

1.3 Planning Process and Report Organization

No questions

1.4 Study Participation, Public Involvement and Coordination

No questions

1.5 Prior Studies, Reports and Existing Water Projects

6. Have all important prior studies performed relative to the study area been described?
SECTION 2.0 – Study Area

2.1 Location and Description

7. Comment on how the reach boundaries were delineated.
8. Have the reaches been adequately described?
9. Comment on the elimination of all but one reach from further consideration.

2.2 Physical Characteristics

10. Comment on the accuracy and thoroughness of the physical descriptions of the study area.

2.3 Geologic Characteristics

11. Comment on the accuracy and thoroughness of the geological descriptions of the study area.

2.4 Seismicity

12. Comment on the accuracy and thoroughness of the seismic descriptions of the study area.

2.5 Climate

13. Comment on the accuracy and thoroughness of the climatic descriptions of the study area.

2.6 Coastal Processes

14. Comment on the accuracy and thoroughness of the descriptions of coastal processes in the study area.

2.7 Littoral Processes

15. Comment on the accuracy and thoroughness of the descriptions of littoral processes in the study area.

16. Comment on the use of data from 1940 – 1980 and recent spot data to describe the rate of historical and recent shoreline change in the San Clemente Area.

17. Comment on the adequacy of the information to support the future short-term and long-term berm width accretion/erosion rates. Do you agree that these trends will coincide with the trend for the MSL?
18. Comment on the adequacy of the process used to monitor beach width and other historical shoreline changes.

19. Comment on the adequacy of the proposed sediment budget. Do you agree with the conclusion that the shoreline is “essentially in balance between erosion and accretion”?

2.8 Environmental Resources

20. Comment on the accuracy and comprehensiveness of the marine habitats information and whether additional information would be beneficial.

21. Comment on the accuracy and comprehensiveness of the water quality information and whether additional information would be beneficial.

22. Comment on the accuracy and comprehensiveness of the sediment quality information and whether additional information would be beneficial.

23. Comment on the accuracy and comprehensiveness of the air quality information and whether additional information would be beneficial.

24. Comment on the accuracy and comprehensiveness of the cultural resources and aesthetics information and whether additional information would be beneficial.

2.9 Economic Conditions

25. Do the demographic characteristics presented provide a clear and accurate representation of the current conditions in the study area?

26. Are the values presented in Table 2-16 representative of current market prices and conditions?

27. Comment on the assumption that the future growth rate of beach attendance will mirror that of population growth.

SECTION 3.0 – Statement of Problems and Needs

3.1 Statement of the Problem

28. Are the general problems facing the study area accurately described?

29. Is the project need clearly stated?

3.2 Railroad Service Interruption and Delay

30. Are the problems facing railroad service in the study area accurately described?
3.3 Recreational Impacts

31. Are the problems facing recreational resources in the study area accurately described?

32. Have all potential beach recreation substitution effects (economic, social, etc.) resulting from a loss in area due to erosion been considered?

33. Comment on the description/discussion of recreational values lost during construction

3.4 Coastal Storm Damages

34. Comment on the adequacy of the integrated coastal engineering-economics analysis to evaluate the shoreline’s physical performance and projected economic costs. What, if anything, is missing from this analysis?

SECTION 4.0 – Plan Formulation

4.1 Planning Process, Planning Opportunities, and Alternative Formulation

No questions

4.2 National Objective

35. Are the objectives complete and clearly defined?

36. Comment on whether the San Clemente project as proposed will contribute to national economic development (NED) output.

4.3 Public Opinion

37. Have the public concerns been identified?

4.4 Planning Objectives and Criteria

38. Are the planning objectives clearly described?

39. Comment on whether the San Clemente project as proposed will meet the planning objectives.

4.5 Planning Constraints and Considerations

40. Are the planning constraints clearly and comprehensively described?

41. Comment on whether the San Clemente project as proposed will fully consider and account for the planning constraints.
4.6 Preliminary Plan Formulation – Conceptual Alternative Measures Considered

42. Are the management measures thorough and accurate?
43. Assess the development of the management measures.
44. Assess the screening process of the management measures.
45. Is the elimination of some of the management measures from further study clearly described?

4.7 Final Alternatives Analysis

46. Are each of the different alternative plans clearly described?
47. Assess the screening process of the potential alternative plans.
48. Comment on the adequacy of the project assumptions used to select the final alternative. What, if anything, is missing from this analysis?

4.8 The NED Plan – Alternative 2

49. Is this alternative clearly described?
50. Are all recreational benefits and losses properly accounted for under Alternative 2 conditions?
51. Are the project lifetime and interest rate used in the analysis reasonable and in line with economic conditions?

4.9 The Four Accounts

52. Have the four accounts, and the models used to estimate their values/impacts, been clearly defined?

4.10 Value Engineering

No questions

4.11 The Environmentally Preferred Alternative

53. Comment on whether the impacts to environmental factors associated with the proposed actions have been accurately and comprehensively described. What, if any, additional information should be included?
54. Assess the screening process used to arrive at the LEDPA.
4.12 Summary of Potential Environmental Consequences for the NED Plan

55. Comment on whether this section considers the potential impacts to the local environment due to both project construction and project operation.

SECTION 5.0 – Tentatively Recommended Plan

5.1 General

56. Are the project lifetime and interest rate used in the analysis reasonable and in line with economic conditions?

5.2 Tentatively Recommended Plan

57. Is the description of the components of the Tentatively Recommended Plan sufficient?

58. Does the Tentatively Recommended Plan give adequate consideration to ongoing or planned projects in the study area?

59. Does the Tentatively Recommended Plan address all real estate interests (private and public) and requirements resulting from the proposed project features?

5.3 General Description of Activities

60. Comment on whether the estimated volume of fill needed is accurate.

61. Comment on whether the sediment volume at the borrow site is sufficient for the Tentatively Recommended Plan.

62. Comment on the use of a hopper dredge during construction.

63. Comment on the description of the onshore placement portion of the Tentatively Recommended Plan.

64. Comment on the description of the construction access and staging areas of the Tentatively Recommended Plan.

65. Comment on whether the component features are adequately designed and sufficient for satisfying the study objectives.

a. Completeness

No questions
5.5 Environmental Effects of Tentatively Recommended Plan

66. Comment on whether the discussion of the environmental commitments is accurate, realistic, and comprehensive.

67. Comment on whether the discussion of the monitoring commitments is accurate, realistic, and comprehensive.

68. Is adaptive management addressed?

69. Have mitigation measures been addressed?

SECTION 6.0 – Implementation of the Tentatively Recommended Plan

6.1 General

No questions

6.2 Cost Apportionment for the Tentatively Recommended Plan

No questions

6.3 Division of Plan Responsibilities

No questions

6.4 Local Sponsor Financial Capability

No questions

6.5 Project Partnership Agreement

No questions

6.6 Approval and Implementation

No questions

SECTION 7.0 – Public Involvement, Review and Consultation

70. Based on your experience with similar projects, has adequate public, stakeholder, and agency involvement occurred to determine all issues of interest and to ensure that the issues have been adequately addressed to the satisfaction of those interested parties?

a. Should additional public outreach and coordination activities be conducted?
7.1 Coordination and Public Views
No questions

7.2 Public Involvement
No questions

7.3 Public Workshop
No questions

7.4 Institutional Involvement
No questions

7.5 Additional Required Coordination
No questions

7.6 Report Recipients
No questions

SECTION 8.0 – Recommendations
No questions

Coastal Engineering Appendix

71. Comment on whether the project setting and length, wave height, erosion rate and sediment sources/budget have been adequately addressed in the project analysis for the development of the preferred alternative.

72. Comment on the use of the logistic probability distribution to determine the design wave period and design wave runup.

73. Comment on the adequacy of the use of the 2001 San Diego (SANDAG) project to predict the project’s mean sea level shoreline change.

74. Comment on the adequacy of the method used to predict the storm induced beach change. In your opinion, did the model calibration procedure consider the uniqueness of the project? Why or why not?

75. Comment on the adequacy of the damage mechanism discussion for each of the eight project reaches. What, if anything, is missing?
76. Comment on the comprehensiveness of the discussion regarding the wave impact forces on the existing railroad. What, if anything, is missing from the Railroad Damage Functions presented in Table 11?

77. Comment on the comprehensiveness of the assumptions used to develop the model parameters, including railroad, railroad service delay, and structural damages. What, if anything, is missing from the methodology?

78. Comment on the array of sacrificial beach widths considered to optimize the beach fill alternatives.

79. In your opinion, are the parameters outlined for the tentatively recommended plan consistent with the project’s natural conditions and the model output? Why or why not?

80. In your opinion, has the feasibility of constructing the proposed alternative been adequately addressed from a constructability and cost standpoint? Why or why not?

Cost Engineering Appendix

81. Comment on the use of one borrow site for the fill sand material required.

82. Comment on the cost estimates being based on one type of dredge.

Economics Appendix

83. Comment on the completeness and accuracy of the model assumptions, variables, and expected future scenarios.

84. Comment on whether the with- and without-project scenarios are clearly discussed.

85. Comment on the thoroughness, robustness, and accuracy of the benefit and cost analysis and associated sensitivity analysis.

86. Comment on whether the methods for performing the benefit costs analysis, including discount rate, project lifetime, base year, etc., are adequately described and justified.

87. Are the economic criteria used to evaluate, screen, and eliminate the alternatives appropriate?

88. Are the values used for calculating the value of average delays for rail passengers (Table 6-11) reasonable and based on sound economic theory and standards?

89. Is the methodology and estimation technique presented economically justified? Are all assumptions reasonable? Does the methodology address all potential components/topics of traditional non-market valuation?
Geotechnical Report

90. Comment on the adequacy of the investigations performed to characterize the offshore sediment material.

91. Comment on the use of the San Diego (SANDAG) study and other past investigations to identify beach compatible borrow sites. Is there sufficient analysis to support the recommended borrow sites?

92. Comment whether the proposed borrow material is well-suited for beach fill material from an engineering, economic and environmental standpoint? Is the volume of available borrow material a factor in future nourishment activities?

Real Estate Appendix

93. Does the plan adequately address all real estate interests (LERRD’s) and requirements allowing for appropriate comparisons across all alternatives?

Independent External Peer Review
San Clemente Storm Damage and Shoreline Protection Environmental Impact Statement

Final Charge Questions

Section 1.0 – Introduction

1.1 Study Area

No questions

1.2 Project Background

No questions

1.3 Document Organization

No questions

SECTION 2.0 – Need for and Objectives of Proposed Action

2.1 Purpose and Need

94. Are the project’s purpose and needs clearly described?

2.2 Project Objective

95. Comment on whether the project objectives are stated clearly and thoroughly.
2.3 Study Authority

No questions

2.4 Compliance with Applicable Regulatory Statutes and Permit Requirements

No questions

SECTION 3.0 – Alternative

Please refer to the charge questions for Sections 4 and 5 of the Feasibility Study.

3.1 Plan Formulation of Alternatives

No questions

3.2 Measures Eliminated from Further Study

No questions

3.3 Measures Carried Forward

No questions

3.4 Description of Alternatives

No questions

3.5 Comparative Impacts Criteria of Alternative Plans

No questions

3.6 Recommended Plan Alternative

No questions

SECTION 4.0 – Affected Environment

4.1 Meteorology and Air Quality

96. Comment on the accuracy and thoroughness of the climate description.

97. Comment on the accuracy and thoroughness of the air quality description.
4.2 Geology and Topography

98. Comment on the accuracy and thoroughness of the geology and topography description.

4.3 Water Quality, Sediments, and Oceanography

99. Comment on the accuracy and thoroughness of the water quality description.

100. Comment on the accuracy and thoroughness of the sediment quality description. Was the sediment quality in the borrow areas adequately analyzed?

101. Comment on the accuracy and thoroughness of the oceanographic description.

102. Comment on the discussion of the historic and existing shoreline in the study area. Has the significance of this issue been adequately evaluated?

103. Comment on the accuracy and thoroughness of the discussion of sediment sources in the study area.

4.4 Biological Resources

104. Comment on whether all appropriate and necessary biological resources have been incorporated and comprehensively discussed.

105. Comment on the accuracy and thoroughness of the historical and existing wildlife and habitat descriptions.

106. Comment on whether the Essential Fish Habitat evaluation in the proposed study area is comprehensive and adequate.

107. Comment on the accuracy and thoroughness of the threatened and endangered species discussion.

4.5 Cultural Resources

108. Comment on the accuracy and thoroughness of the cultural resources discussion.

4.6 Ground and Vessel Transportation

109. Comment on the accuracy and thoroughness of the transportation discussion.

4.7 Land Use and Policy

110. Comment on the accuracy and thoroughness of the land use and policy discussion.
4.8 Noise

111. Comment on the accuracy and thoroughness of the noise discussion.

4.9 Recreation

112. Comment on the accuracy and thoroughness of the recreation discussion.

4.10 Aesthetics

113. Comment on the accuracy and thoroughness of the aesthetics discussion.

4.11 Public Health and Safety

114. Comment on the accuracy and thoroughness of the public health and safety discussion?

4.12 Socioeconomics/Environmental Justice

115. Comment on the accuracy and thoroughness of the socioeconomics discussion.

116. Have all environmental justice concerns been identified?

SECTION 5.0 – Environmental Consequences of Proposed Action and Alternatives

5.1 Air Quality and Meteorology

117. Comment on the predicted impacts of each alternative on the air quality of the project area.

5.2 Geology and Topography

118. Comment on the assessment of project performance based on the low, intermediate, and high projections of sea level rise rates.

119. Comment on the adequacy of the impact evaluation for the various beach width alternatives.

5.3 Water Resources

120. Comment on the accuracy and thoroughness of the criteria used to assess water quality impacts.

121. Comment on the predicted impacts of each alternative on the water quality in the project area.
5.4 Biological Resources

122. Comment on the accuracy and thoroughness of the criteria used to assess biological resource impacts.

123. Comment on the predicted impacts of each alternative on the biological resources in the project area.

124. Comment on the predicted impacts of each alternative on the Essential Fish Habitat in the project area.

5.5 Cultural Resources

125. Comment on the accuracy and thoroughness of the criteria used to assess cultural resource impacts.

5.6 Ground and Vessel Transportation

126. Comment on the accuracy and thoroughness of the criteria used to assess transportation impacts.

5.7 Land Use and Policy

127. Comment on the accuracy and thoroughness of the criteria used to assess land use impacts.

5.8 Noise

128. Comment on the accuracy and thoroughness of the criteria used to assess noise impacts.

5.9 Recreation

129. Comment on the accuracy and thoroughness of the criteria used to assess recreation impacts.

5.10 Aesthetics

130. Comment on the accuracy and thoroughness of the criteria used to assess aesthetic impacts.

5.11 Public Health and Safety

131. Comment on the accuracy and thoroughness of the criteria used to assess public health and safety impacts.
5.12 Socioeconomics/Environmental Justice

132. Comment on the accuracy and thoroughness of the criteria used to assess socioeconomic and environmental justice impacts.

SECTION 6.0 –Plan Selection

6.1 Description of Cumulative Projects

133. Have the cumulative impacts of the project and other previous and future projects in the area been accurately described? Should any additional information be included?

134. Comment on the assumption that the placement of sediment on the beach or into the nearshore zone at Capistrano Beach would add sediment to the Oceanside littoral cell.

135. Comment on the assumption that some of the transported Dana Point Harbor sediment would widen the San Clemente Beach but would not add to the sand build-up on reefs.

6.2 Analysis of Cumulative Impacts

No questions

6.2.1 Air Quality and Meteorology

136. Comment on the predicted cumulative impacts on air quality in the project area.

6.2.3 Water Resources

137. Comment on the predicted cumulative impacts on water resources in the project area.

6.2.4 Biological Resources

138. Comment on the predicted cumulative impacts on biological resources in the project area.

6.2.5 Cultural Resources

139. Comment on the predicted cumulative impacts on cultural resources in the project area.

6.2.6 Ground and Vessel Transportation

140. Comment on the predicted cumulative impacts on transportation in the project area.

6.2.7 Land Use Policy

141. Comment on the predicted cumulative impacts on land use in the project area.
6.2.8 Noise

142. Comment on the predicted cumulative impacts on noise in the project area.

6.2.9 Recreation

143. Comment on the predicted cumulative impacts on recreation in the project area.

6.2.10 Aesthetics

144. Comment on the predicted cumulative impacts on aesthetics in the project area.

6.2.11 Public Health and Safety

145. Are the mitigations efforts discussed adequate to address all cumulative public health and safety concerns?

6.2.12 Socioeconomics/Environmental Justice

146. Comment on the predicted cumulative impacts on socioeconomic and environmental justice in the project area.

SECTION 7.0 – Environmental Commitments

147. Is the discussion of environmental commitments and mitigation comprehensive and adequate? What, if anything, is missing?

SECTION 8.0 – OTHER NEPA/CEQA REQUIRED ANALYSES

148. Comment on the accuracy of the description of unavoidable adverse effects resulting from the implementation of the alternatives.

149. Comment on the accuracy of the description of the irreversible and irrevocable commitments of resources.

150. Comment on the accuracy of the description of the relationship between short-term uses and long-term productivity.

8.1 Effects Found not to be Significant

No questions

8.2 Unavoidable Significant Impacts

No questions
8.3 Irreversible and Irretrievable Commitment of Resources

No questions

8.4 Growth Inducing Impacts

No questions

8.5 Energy Requirements and Conservation Potential of Alternatives and Mitigation Measures

No questions

8.6 Relationship between Short-term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

No questions

SECTION 9.0 – Public Involvement and Interagency Coordination

9.1 Required Coordination

No questions

9.2 Public Involvement

No questions

9.3 Interagency Coordination

No questions

9.4 Required Permits and Approvals

No questions

Appendix A: Air Quality Analysis Report

151. Comment on the accuracy and comprehensiveness of the Air Quality Analysis Report.

Appendix B: Coastal Engineering Report

Please refer to the Feasibility Report charge questions for the Coastal Engineering Report.

Appendix C: Geotechnical Report

Please refer to the Feasibility Report charge questions for the Geotechnical Report.