COASTAL CONSERVANCY

Staff Recommendation
September 25, 2008

TIJUANA ESTUARY SEDIMENT FATE AND TRANSPORT STUDY

File No.: 08-028-01
Project Manager: Karen Bane

RECOMMENDED ACTION: Authorization to disburse an amount not to exceed $425,000 to the Southwest Wetlands Interpretive Association to implement a study of sediment transport in the coastal nearshore at the Tijuana River National Estuarine Research Reserve, San Diego County that will facilitate analysis of beneficial sediment reuse policies in California.

LOCATION: County of San Diego, Cities of Imperial Beach and San Diego, Tijuana River National Estuarine Research Reserve

PROGRAM CATEGORY: Resource Enhancement

EXHIBITS

Exhibit 1: Project Location and Detailed Schematic of Project Design

Exhibit 2: Science Plan: Tijuana Estuary Sediment Fate and Transport Demonstration Project (April 15, 2008)

Exhibit 3: Mitigated Negative Declaration adopted by California Department of Parks and Recreation on April 29, 2008

Exhibit 4: Mitigation Monitoring and Reporting Program

Exhibit 5: Project Letters

Exhibit 6: Environmental Impact Report/Statement adopted by the California Department of Parks and Recreation on January 16, 2002 (document available on request)

Exhibit 7: January 24, 2002 Conservancy resolution and staff recommendation

RESOLUTION AND FINDINGS:

Staff recommends that the State Coastal Conservancy adopt the following resolution pursuant to Sections 31251-31270 of the Public Resources Code:

"The State Coastal Conservancy hereby authorizes the disbursement of an amount not to exceed $425,000 (four hundred twenty-five thousand dollars) to the Southwest Wetlands and Interpretive Association (SWIA) to implement the Tijuana Estuary Sediment Fate and Transport Study and approves the Mitigation Monitoring and Reporting Program, attached to the accompanying staff recommendation as Exhibit 4.

This authorization is subject to the following conditions:

1. Prior to disbursement of funds, SWIA shall submit for the review and approval of the Executive Officer:
   a. A work plan, including schedule and budget;
   b. Evidence that all permits and approvals necessary to implement the project have been obtained; and
   c. The names and qualifications of any contractors that the grantee intends to employ to carry out the project.
2. SWIA shall provide evidence to the Conservancy that it has implemented the mitigation measures contained in the Mitigation Monitoring and Reporting Program, attached to the accompanying staff recommendation as Exhibit 4."

Staff further recommends that the Conservancy adopt the following findings:

"Based on the accompanying staff report and attached exhibits, the State Coastal Conservancy hereby finds that:

1. The proposed project is consistent with the current Project Selection Criteria and Guidelines.
2. The proposed authorization is consistent with the purposes and objectives of Chapter 6 of Division 21 of the Public Resources Code, regarding coastal resource enhancement.
3. The Conservancy has independently reviewed and considered the Mitigated Negative Declaration (MND) for the project adopted by the California Department of Parks and Recreation (DPR) on April 29, 2008, attached to the accompanying staff recommendation as Exhibit 3. Based on the MND and the Environmental Impact Report/Environmental Impact Statement, approved by DPR on January 16, 2002 and adopted by the Conservancy on January 24, 2002, the Conservancy finds that the project, as mitigated, avoids, reduces or mitigates potential significant environmental effects and that there is no substantial evidence that the project will have a significant effect on the environment, as defined in 14 California Code of Regulations Section 15382."

PROJECT SUMMARY:

The Tijuana Estuary Sediment Fate and Transport Study is an empirical study that will describe the physical processes and pathways responsible for fine-grain sediment dispersal in the nearshore marine environment. The results of this study will facilitate review of current policy and practice by federal and state agency decision makers. The outcome of policy and regulation review will enable coastal managers to better plan and budget for the restoration and maintenance of coastal resources and could benefit beach and littoral cell nourishment throughout California.

Project Background:

Throughout California, coastal development has altered the flow of rivers and streams, changing the movement of sediment. In many cases, these alterations have led to coastal wetlands filling up with sediment and, in certain areas, beaches have a deficit of sand due to coastal features such as harbors, jetties, and groins. Economic and environmental incentives exist to transport sediment from areas of surplus to those of deficit. For example, watershed and wetland restoration, including dam removal, entails massive excavation of sediment followed by long-term maintenance of sediment levels. Many of these potential restoration projects are in close proximity to the ocean, where the sediment would have been naturally deposited. If sediment could be beneficially reused in the coastal nearshore, cost savings would be realized throughout the State.

Currently, the U.S. EPA applies a precautionary rule of thumb that stipulates sediment must be eighty percent coarse material and twenty percent fines to be placed in the nearshore, unless additional information exists to show that such placement won't result in environmental degradation. Much of the coastal sediment available for beach nourishment from watershed and wetland restoration projects does not meet the eighty: twenty (80:20) percent "rule of thumb" for placement in the nearshore and is disposed of on land instead of being reused to replenish the sand supply of local beaches. This practice hinders the potential beneficial uses of sediment and dramatically drives up watershed and wetland restoration costs. In addition, the inconsistency in the application of the "rule of thumb" creates budgeting uncertainties, reducing efficiency.

Regulatory agencies state that they would like to have the scientific evidence needed to evaluate the appropriateness of the 80:20 "rule of thumb", and perhaps increase the amount of fine grain sediments that are currently approved for use in beneficial sediment reuse projects. And many engineers and scientists hypothesize that a higher percentage of fines may be deposited in the coastal nearshore without detriment to sensitive nearshore habitats and species. The proposed project would equip decision makers with the information necessary to evaluate the current policies.

Scientific Review:

The proposed project is the first to be reviewed by the Ocean Protection Council's Science Advisory Team, led by the Ocean Science Trust. The Science Plan (Exhibit 2) for the proposed project was reviewed by three independent and anonymous reviewers. The substantive comments provided by the reviewers included the following questions: Is it possible that a literature search would provide the same information as the proposed project? What are the qualifications of the science team? What is the applicability of the results of the study throughout the State? USGS answered these questions as follows: The data collected from this study would be novel and does not currently exist in the literature; The science team consists of leading scientists who have written many of the scientific papers referred to by the reviewers; And, lastly, the results of this study would be applicable to sites throughout the State with similar physical conditions. The Science Plan was updated to reflect the responses to the scientific reviews.

Project Details and Scope of Work:

The proposed project will promote science-based decision-making with regards to sediment appropriate for beach nourishment by evaluating if the 80:20 percent "rule of thumb" is appropriately protective or overly conservative. Evaluation of the 80:20 percent "rule of thumb" will be completed by tracking the transport paths, transit rates, and deposition areas of fine-grained sediments in the nearshore area when sediment with greater than twenty percent fines is used for beach nourishment. Physical and biological data will be collected to assess the extent, duration, and impacts of turbidity and sedimentation. These physical and biological data will be shared with regulatory agencies to facilitate a review of the existing policy. The details of the sediment monitoring for the proposed project have been thoroughly documented in the Science Plan authored by USGS (Exhibit 2).

The proposed project will involve the deposition of 60,000 cubic yards of sediment to designated areas on the beach south of the Tijuana River mouth, followed by extensive physical and biological monitoring. The clean, sorted sediment for the study will be obtained from the Goat Canyon sediment basins at the Tijuana River National Estuarine Research Reserve (TRNERR). Sediment placement will occur over approximately four months in the fall/winter of 2008/2009 during low tides. Sediment placement would occur in three phases; Phases 1 and 2 would each involve transport and deposition of approximately 10,000 cubic yards of sediment, and Phase 3 would involve transport and deposition of approximately 40,000 cubic yards of sediment.

Dispersion of the placed materials in the oceanic environment will be monitored by USGS according to the proposed Science Study (Exhibit 2) to determine the physical movement of these sediments. The physical monitoring will include: 1) Seafloor mapping of bathymetry and seabed sediment type using high resolution sonar and underwater video collected by divers; 2) Plume mapping with nearshore tripods including optical and acoustic sensors to evaluate suspended sediment and water velocity; 3) Boat-based plume mapping where seafloor grain size will be sampled with an underwater camera and the water column will be sampled with a conductivity, temperature, depth (CTD) sensor combined with optical turbidity and grain size sensors; 4) Plume mapping in the surf zone using topographic surveys; and 5) Plume mapping using aerial remote sensing to collect multi-spectral imagery of the study area. Prior to commencement of sediment placement, USGS will perform baseline monitoring at the study site, beginning in April 2008. Results of the study regarding the transport and fate of fine grained sediments in the surf zone will be published as a USGS professional paper.

A biological monitoring program will be undertaken simultaneously with the physical monitoring to determine if any adverse biological impacts would arise from the use of these sediments. The biological monitoring program is in development and has not yet been described in as much detail as the physical monitoring program. It could include examination of seabird and shorebird foraging, the benthic invertebrate macrofauna community of the intertidal zone, any nearshore sand dollar beds, and nearshore aquatic flora. The Coastal Conservancy has paid for the development of the biological monitoring program, which will be developed by the research coordinator from the TRNERR. The implementation of the biological monitoring plan will be funded through the proposed project.

The data gathered from the proposed project will be useful in the future assessment of sediment reuse projects at sites with similar physical conditions throughout the State, and in the evaluation

of statewide policies. The relationships between physical forcing (e.g., shear stresses, current, and buoyancy in the bottom boundary layer) and sediment transport found during the proposed project would allow for application of the results of this study to other sites by means of comparison of physical conditions (e.g., wave climate, current trends and variations, and nearshore morphology) between the sites. As noted in the Science Plan (Exhibit 2), three sediment placements were proposed primarily to ensure a diverse set of forcing conditions. Thus, the sediment transport data obtained during the project would be compared with a diverse set of shear stresses and currents across the water column. It is the development of these kinds of relationships that make the proposed study applicable to other sites, especially along the California coast where the patterns in waves, currents, and coastal morphology are well documented.

In addition to the sediment placement and monitoring, the proposed project will also include facilitation of agency workshops and meetings to evaluate potential policy revisions. The Coastal Sediment Management Workgroup (CSMW) will take the lead in facilitating this policy review and will work with regulatory agencies such as U.S. EPA to develop new policies based on the results of the study. The number and format of agencies meetings and workshops will depend on future discussions with regulatory agencies. Created in 1999, the mission of the CSMW is to facilitate regional approaches to protecting, enhancing and restoring California's coastal beaches and watersheds through federal, state and local cooperative efforts. The CSMW's primary goal is to facilitate and streamline regional sediment management (RSM) along California's coast and increase beneficial reuse of available and appropriate sediment (e.g., beach restoration).

The US EPA has indicated they will use the data collected in this study to evaluate sediment reuse projects in the future. They have also agreed that if data gathered from this study indicate that the 80:20 "rule of thumb" can be amended due to scientific evidence, the proposed project could potentially lead to state-wide changes in the policies guiding sediment reuse, most likely through regional general permits that could be incorporated into Coastal RSM Plans being developed through CSMW's efforts. The revision or confirmation of policy resulting from this project would give the CSMW, regional entities (e.g., San Diego Association of Governments (SANDAG)) developing Coastal RSM Plans, and regional partnerships such as the Southern California Wetlands Recovery Project more certainty about long-term sediment availability, viability of potential source materials for beach nourishment, potential for sediment reuse, and costs of wetland restoration projects.

The proposed project has received state and federal support and participation. State funding has been authorized by the Ocean Protection Council and the Department of Boating and Waterways. The U. S. Geological Survey is providing their labor as an in-kind contribution.

The Southwest Wetlands Interpretive Association (SWIA) has been managing research and restoration projects at the Tijuana Estuary since 1979. SWIA works closely with the TRNERR and the Department of Parks and Recreation and has recently completed the Feasibility Study for 250-acre restoration of the southern arm of Tijuana Estuary. SWIA's board and staff includes of council members from the City of Imperial Beach, a former Coastal Commissioner, and community members active in the protection and restoration of Tijuana Estuary for the past 40

years. SWIA has been involved with the development of the proposed project for the past two years.

Site Description: The proposed project would occur along the shoreline of Border Field State Park and south of the Tijuana Slough National Wildlife Refuge, both of which are part of the Tijuana River National Estuarine Research Reserve (TRNERR), a RAMSAR Wetland of International Importance (Exhibit 1). The project site is located within both the City of Imperial Beach and the City of San Diego, immediately north of the US-Mexico border and approximately 18 miles south of downtown San Diego. Portions of the low tide deposition area may technically fall within jurisdiction of California State Lands Commission which has authority over lands seaward of the mean high tide line. The proposed study site was chosen because it provided an adequate amount of sediment, had wave conditions that were generally comparable to, at the very least, the southern California coastline, and had a partner (the TRNERR) that had the flexibility and desire to conduct such research. In addition to the policy implications, the project could potentially have incidental beach nourishment benefits, incrementally supplementing the beach and dune barrier system between the TRNERR and the ocean. Current models predict that these barrier dunes could be breached by the year 2045.

Sediment management is a daily part of managing the TRNERR. The existing Goat Canyon sediment basins were completed in the spring of 2005. These basins were constructed to intercept high volumes of sediment generated south of the international border in Tijuana, Mexico. This sediment is generated by uncontrolled development and vegetation clearing on erosive soils present upstream in the watershed. Annual maintenance of the basins involves removal of approximately 40,000 cubic yards of sediment. Sediment removed during maintenance activities is disposed of at upland locations.

Project History: This project has been developed over the past two years through a partnership of the Coastal Conservancy, the CSMW, the USGS, the Department of Boating and Waterways, the TRNERR (including NOAA, and the California Department of Parks and Recreation) and the Southwest Wetlands Interpretive Association. Since 1999, the CSMW has been compiling information, developing tools, and recommending improvements to policy, procedures and regulations to maximize the appropriate and beneficial reuse of sediment from areas of detrimental accumulation at erosional areas of concern along the coast. Through this partnership, the USGS was identified as an organization that could conduct the research component of the proposed project. The Department of Boating and Waterways and the Coastal Conservancy have funded the pre-project costs such as permitting and baseline surveys.

PROJECT FINANCING:

Coastal Conservancy (requested)	$425,000
Ocean Protection Council	$957,000
Coastal Conservancy	$ 345,344
Department of Boating and Waterways	$613,080
USGS (in-kind)	$346,267
Total Project Cost	**$**2,686,691

The anticipated source of funds will be the fiscal year 2006 appropriation from the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50). Proposition 50 authorizes the use of these funds for "protecting coastal watersheds, including, but not limited to, acquisition, protection, and restoration of land and water resources and associated planning, permitting, and administrative costs." The proposed project is necessary to inform planning of future coastal wetland restoration projects which entail management of large quantities of sediment excavation and reuse. Previous funding from the Conservancy was allocated to the design and permitting required to develop the proposed project. As required by Proposition 50, the proposed project is consistent with regional water quality plans (Water Code Section 79570) as described in the Consistency with Local Watershed Management Plan/State Water Quality Control Plan section below, and includes monitoring.

CONSISTENCY WITH CONSERVANCY'S ENABLING LEGISLATION:

The proposed project would be undertaken pursuant to Chapter 6 of the Conservancy's enabling legislation, Division 21 of the Public Resources Code (Sections 31251-31270), regarding enhancement of coastal resources.

Under §31251, the Conservancy may award grants to non-profit organizations for the purpose of enhancement of coastal resources where, due to natural or human-induced events or incompatible land uses, the resources have suffered the loss of natural and scenic values. Consistent with this section, the proposed project provides data needed to confirm or amend sediment reuse policies which will provide greater certainty and potentially reduce costs for both restoration and maintenance not only of the estuary and beach in the vicinity of the Tijuana River but also of other coastal wetlands and shorelines in the region.

Under Section 31252 the project area to be enhanced must be "identified in a certified local coastal plan or program as requiring public action to resolve existing or potential resource protection problems." The proposed project is consistent with City of Imperial Beach General Plan & Coastal Plan and the City of San Diego's Tijuana River Valley/Border Highlands Land Use Plan as described in the Consistency with Local Coastal Program Policies below.

The proposed authorization is consistent with §31253, which states that the Conservancy may provide up to the total cost of any coastal resource enhancement project. As discussed in the "Project Financing" section above, the proposed grant from the Conservancy would contribute a significant portion of the total cost. In determining the amount of Conservancy funding for this project, the factors identified in §31253 have been considered and applied, as described in detail below under the heading "Consistency with Conservancy's Project Selection Criteria & Guidelines."

CONSISTENCY WITH CONSERVANCY'S 2007 STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):

Consistent with **Goal 6, Objective G** of the Conservancy's 2007 Strategic Plan, the proposed project will support the implementation of regional sediment management throughout California by providing the data needed to reduce uncertainty about the sources of sediment for beneficial reuse.

CONSISTENCY WITH CONSERVANCY'S PROJECT SELECTION CRITERIA & GUIDELINES:

The proposed project is consistent with the Conservancy's Project Selection Criteria and Guidelines, last updated on September 20, 2007, in the following respects:

Required Criteria

1. **Promotion of the Conservancy's statutory programs and purposes:** See the "Consistency with Conservancy's Enabling Legislation" section above.
2. **Consistency with purposes of the funding source:** See the "Project Financing" section above.
3. **Support of the public:** Support of the public has been demonstrated through letters of support provided by the U.S. Environmental Protection Agency, San Diego County Supervisor Greg Cox, Imperial Beach Mayor James Janney, SANDAG, BEACON, CMANC, and USGS (Exhibit 5). The proposed project has considerable public support, which has been raised through several meetings with regional governance agencies, elected officials, and a public information meeting at the Tijuana Estuary Visitor's Center.
4. **Location:** The proposed project would be located within the coastal zone of the Cities of Imperial Beach and San Diego.
5. **Need:** Implementation of the proposed project is scheduled to start in September. The entire funding package must be in place before work may begin.
6. **Greater-than-local interest:** The proposed project would have statewide implications for the feasibility of watershed and wetland restoration and for the scientifically sound and economically responsible nourishment of eroding beaches.

Additional Criteria

7. **Urgency:** The pre-project work, such as permitting and baseline monitoring has already begun for this project. If funding were delayed, the project would not be able to commence in the fall of 2008 and expenditures to date would be wasted.
8. **Resolution of more than one issue:** The proposed project would help to resolve policy issues, would provide greater certainty for budgeting state-funded projects, could reduce the costs of maintenance at the TRNERR, and could have ancillary beach nourishment benefits at the Tijuana Estuary shoreline.
9. **Leverage:** See the "Project Financing" section above.

11. **Innovation:** The proposed project will utilize state of the art technology to answer a question at a level of detail that, to date, has never been done before.
12. **Readiness:** SWIA and USGS have already commenced the project with other funding identified in the Project Financing section above.
13. **Realization of prior Conservancy goals:** The Conservancy has conducted two restoration projects in the TRNERR. For one, sediment was deposited in the nearshore. Regulators denied that approach for the second. Costs for restoration were wildly different. This project provides data that may give more certainity about sediment reuse options and consequently restoration costs. This certainty will help not only future restoration efforts at the TRNERR but also for other major coastal wetland restoration projects in the region.
15. **Cooperation:** The proposed project is a partnership of state and federal agencies, local jurisdictions, and non-profit organizations. See the "Project History" section above.

CONSISTENCY WITH LOCAL COASTAL PROGRAM POLICIES:

The proposed project is consistent with the City of Imperial Beach General Plan & Coastal Plan. According to Goal 2, the natural resources including the beach and estuary "are recognized as the foundation for all aspects of the community" and "conservation and protection of these resources shall be a key focus" of the plan. Policy P-12 indicates that the "environmental integrity of all beach areas shall be maintained and enhanced." Goal 16 directs shoreline protection activities to be conducted in a "way which enhances the shoreline environment." Consistent with these goals and policies, the proposed project provides data needed to confirm or amend sediment reuse policies which will provide greater certainty and potentially reduce costs for both restoration and maintenance of the Tijuana River Estuary and nourishment of the beach.

The City of San Diego's certified Local Coastal Plan for the Goat Canyon area (Tijuana River Valley/Border Highlands Land Use Plan) designates Goat Canyon as "Multi-Species Conservation Open Space." Goat Canyon lies within the City of San Diego's Multiple Habitat Preservation Area. The project is consistent with the Multiple Species Conservation Plan (MSCP) in that it provides data needed to confirm or amend sediment reuse policies which will provide greater certainty and potentially reduce costs for maintaining the sediment basins installed to stop progressive deterioration of critical habitats resulting from flash floods and sediment deposition.

CONSISTENCY WITH LOCAL WATERSHED MANAGEMENT PLAN/ STATE WATER QUALITY CONTROL PLAN:

In "A Binational Vision for the Tijuana River Watershed," it is acknowledged that restoration and maintenance of the Tijuana River Estuary requires excavation of accumulated sediment and protection of the barrier beach dune system such that nourishing the beach with excavated material would be a strategy to consider (http://trw.sdsu.edu/English/Publications/visionDraft.htm). The Tijuana River Estuary is noted as an important resource in the Water Quality Control Plan for the San Diego Basin. The proposed project is necessary to inform whether sediment with the grain sizes typically found in the

estuary as well as other coastal wetlands in Southern California may be placed in the nearshore in an environmentally responsible manner. The results will inform the amount and timing of restoration given the funding available.

COMPLIANCE WITH CEQA

The Conservancy, as a responsible agency under the California Environmental Quality Act (CEQA), would be contributing funds for removal of sediment from the existing detention basins, sorting, transporting, and placing sediment in the nearshore area to conduct the project. The activities of the proposed project, including sediment transport and placement, are addressed in the Mitigated Negative Declaration (MND), approved by the California Department of Parks and Recreation (DPR) on April 29, 2008 (Exhibit 3). The proposed project includes use of sediment excavated during annual maintenance of existing sediment detention basins. Operation and maintenance of the basins is addressed in the Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Goat Canyon Enhancement Project, approved by DPR on January 16, 2002, which was also approved by the Conservancy on January 24, 2002. (Exhibit 6).

The MND discusses the potential environmental effects of the sediment transport and placement, which are in the areas of air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, recreation, and transportation/traffic. The MND incorporates mitigation measures to ensure that the project avoids any significant environmental effects; these mitigation measures direct construction monitoring of sensitive environmental, cultural, and recreational resources; establishment of buffers around sensitive wildlife areas; cultural resource mapping, testing, and protection; use of best management practices (BMPs) for water quality protection; and sediment testing. All mitigation measures proposed by the Mitigated Negative Declaration are contained in the Mitigation Monitoring and Reporting Program (MMRP) (Exhibit 4). Under CEQA, the lead agency, (here DPR) must approve a MMRP; if the lead agency has not approved an MMRP, the responsible agency must approve the MMRP. Staff recommends that the Conservancy approve the MMRP attached as Exhibit 4 as part of the authorization for this project.

DPR's EIR/EIS (Exhibit 6) was approved by the Conservancy on January 24, 2002 when the Conservancy authorized funding for construction of the detention basins, including their operation and maintenance. These project elements under the proposed authorization remain consistent with the project analyzed under the EIR/EIS approved by the Conservancy on January 24, 2002. (Exhibit 7).

The Conservancy's staff has reviewed the DPR's MND for this project and recommends that the Conservancy, as a responsible agency, find that there is no substantial evidence that the project, as mitigated, will result in any significant environmental effects. Upon approval of the project, staff will file a Notice of Determination.