

Staff Report

File #: 24-397

Agenda Date: 11/20/2024

Agenda #: 12.

DATE: November 20, 2024

TO: Honorable Mayor and City Councilmembers

FROM: City Manager's Office

TITLE: RE:BEACH OCEANSIDE PILOT PROJECT SITING ANALYSIS AND RECOMMENDATION

RECOMMENDATION

Staff recommends that the City Council take the following actions related to RE:BEACH Oceanside Pilot Project Siting:

1) Receive information about the multi-criteria siting analysis and associated public outreach, and concur with staff's recommendation to select Segment 1, along and seaward of The Strand between Tyson Street Park and Wisconsin Avenue, as the RE:BEACH pilot project location.

2) Authorize staff to proceed with final design, engineering and environmental compliance tasks, with the Phase 2 Sand Nourishment and Retention Pilot Project sited in Segment 1.

BACKGROUND AND ANALYSIS

Since construction of the Camp Pendleton Boat Basin and City's Small Craft Harbor (Harbor Complex), over 21 million cubic yards (cy) of sand have been artificially placed on City beaches from either dredging activity to build the two harbors, the removal of sediment from the San Luis Rey River, the U.S. Army Corps of Engineers annual navigation dredging program or one-off, local or regional beach nourishment events. Despite all these efforts, coastal areas south of Harbor Beach (i.e., south of South Jetty) have been largely unable to sustain a dry sand beach for recreational, ecological and coastal storm damage protection purposes.

In 2020, the City conducted a year-long preliminary engineering evaluation and Feasibility Study to identify deficiencies in current coastal management actions as well as to determine a suite of solutions to lessen long-term beach erosion and mitigate the effects of the Harbor Complex. The Feasibility Study (Phase 1) concluded that 1) a high-quality source of sand, coupled with a beach nourishment program, should be 2 identified to provide more efficient and consistent beach nourishment opportunities, and 2) retention structure(s) are desirable as a means of retaining placed sand, since historical surveys and anecdotal data have shown that placed sand does not persist on most of Oceanside's beaches. At an August 2021 Public Workshop, the City Council provided staff direction to pursue the recommendations given in Phase 1. Specifically, staff was directed to move forward with the environmental analysis, design, and permitting of a Phase 2 pilot project that would provide both beach nourishment and sand retention options.

On January 25, 2023, the City Council approved a contract with GHD Inc. (GHD) related to Phase 2 of the City's Sand Nourishment and Retention Pilot Project (Attachment 2). The main tasks outlined in the Phase 2 scope included:

- Community and Stakeholder Engagement
- Baseline Monitoring Development
- Engineering, Analysis and Design
 - Final Design and Engineering
 - Plans and Specifications
- Environmental Compliance and Permitting

To achieve an innovative sand retention concept that would provide the community with multiple benefits that extend beyond sustaining a sandy shoreline, the City hosted an eight-month long international public design competition, called RE:BEACH Oceanside Coastal Resilience Design Competition. The RE:BEACH competition process was developed by the Project Team, comprised of the City's Coastal Zone Administrator, GHD and Resilient Cities Catalyst (RCC), with ongoing support from the City Team, comprised of City staff representatives from Development Services, Public Works, Marine Safety and the City Manager's Office.

On January 31, 2024, the City Council hosted a Council Workshop and voted unanimously to approve moving forward with International Coastal Management's (ICM) "Living Speed Bumps" concept to restore and preserve sand on Oceanside beaches. The City Council approval moved the "Living Speed Bumps" concept into the final design and engineering phase of the project, with the siting of the pilot project being the next step in working towards a final design.

The Living Speed Bumps concept proposes to construct one multi-purpose offshore artificial reef and two headlands, supported by nearshore and onshore beach nourishment, (Figure 1), in a location that is being determined through the Siting Analysis.

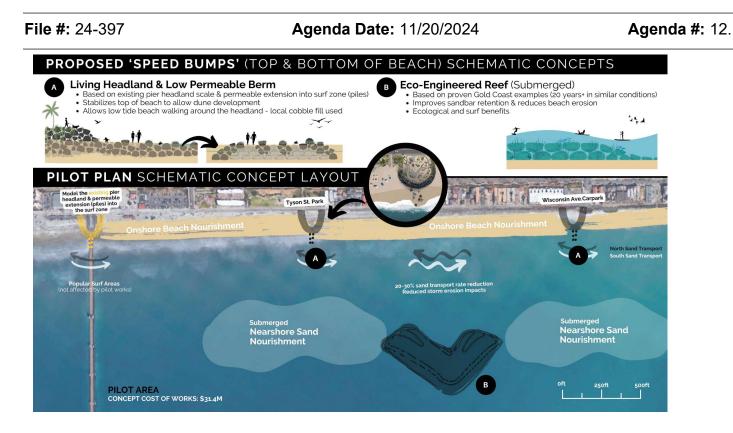


Figure 1. Conceptual diagram of Living Speed Bumps design

The offshore reef's design intent is to dissipate wave energy through wave breaking, which then stabilizes the sand bars and beach in its lee (i.e., shoreward side of the reef). The crest of the reef (i.e., its shallowness) can be optimized to maintain longshore sediment transport around the reef. Waves breaking on the reef contribute to slowing the rate of longshore transport along the beach, and creating a salient sand bar that mimics natural offshore reef structures along the California coast. Though the reef is being designed to primarily stabilize the beach, improvements to surfing resources are also a

project goal.

Two artificial headlands will be positioned on the shore, both north and south of the reef. The headlands will provide park amenities, coastal viewing and beach access improvements, as well as assist with beach stabilization and opportunities for intertidal habitat formation. The headlands are designed to complement the sand bar formation in the lee of the artificial reef and increase beach formation.

It is important to note that the artificial reef, the two headlands, and the nearshore and onshore beach nourishment efforts represent the entirety of the pilot project. The specific details of the shape and size of both the reef and headlands, as well as the requisite sand nourishment quantities, will be determined in the next step of engineering design where numerical modeling and physical modeling will be used to optimize the design to achieve the various project objectives. Other important design elements, such as a strategy for the development of back beach dunes once the beach is stabilized, will also be developed in the engineering design phase for the project. File #: 24-397

Public and stakeholder comments submitted throughout the design competition highlighted the need for beach stabilization solutions for the entirety of Oceanside's coastline. As this is a pilot project, only one location can be selected to determine the efficacy of this innovative pilot project design. Determining the efficacy of the design is an important step before implementing the project in other locations along Oceanside's coastline because the concept is new and innovative.

Siting Analysis:

A Siting Analysis, which objectively evaluated potential locations for the pilot project, has been ongoing since July 2024 and included significant input from the community. The Siting Analysis evaluated three potential locations for the pilot project south of the Oceanside Pier, where shoreline erosion impacts are the greatest. The three segments being evaluated, determined by natural breaks in the coastline and major access routes, include:

- 1) South The Strand (Seagaze to Wisconsin);
- 2) Wisconsin to Buccaneer Beach (north of Loma Alta Creek); and
- 3) Buccaneer Beach (south of Loma Alta Creek) to Buena Vista Lagoon.

Several base assumptions were made when determining the methodology for conducting the Siting Analysis:

- 1) The pilot project should be considered to be feasible in each of the evaluated segments;
- The winning design concept dimensions should be applied "as-is" uniformly across all segments; and
- 3) The headlands should connect with existing public accessways (vehicular and/or pedestrian) to facilitate both public and emergency service/lifeguard access.

To identify a recommended layout for each segment, existing shoreline conditions, existing amenities and potential opportunities for expansion of public benefits was thoroughly assessed by the Project Team and City Team. The recommended layouts displayed below (Figure 2) represent the most suitable layouts for the headlands and offshore reef within each segment, based on the defined siting parameters and analysis assumptions. In the following Figure, the recommended location of the headlands is called out by street name in each segment, with the reef to be situated between the headlands.

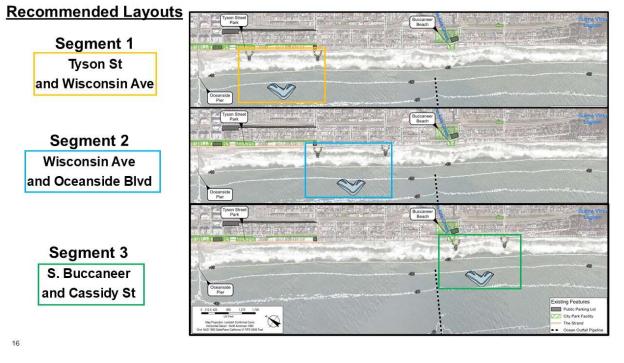


Figure 2.

Recommended layouts in each segment

To objectively evaluate each segment, the Siting Analysis focused on evaluating factors related to the successful implementation and performance of the pilot project. The evaluated factors included the following criteria:

- **Creation/Restoration of Beach over Design Life:** Assesses the overall performance of the system, where performance goals are defined as the creation of an initial 100 ft. wide beach and the maintenance of a stable, dry beach over the pilot's design life (approximately 20-30 years).
- Sediment Supply to Adjacent Beaches: Assesses the anticipated long-term sediment supply (i.e., increase/decrease) on adjacent beaches outside of the immediate pilot project.
- **Coastal Access and Amenities:** Assesses existing public access amenities for beach use, including parking, public transit connection, lifeguard services, parks, bathrooms and showers.
- **Property Risk Assessment**: Assesses for risks and uncertainties associated with the pilot project negatively affecting shoreline assets, both public and private.
- **Private/Public Property Entitlements:** Assesses the surrounding connections (i.e., interface) between private and public property boundaries and uncertainties on how adjacent private and public connections could be managed long term.
- **Constructability:** Assesses the feasibility of the initial construction of the pilot, including the headlands and reef, as influenced by its physical location.
- **Construction Costs**: Assesses the expected initial construction cost of the pilot project including accounting for the staging area distance from the work site, proximity of land-based access points for equipment, and the additional placement of material to allow for construction operations to occur.
- Adaptive Management: Assesses the anticipated ability and cost of adaptative management,

including modifying features or sand nourishment needs based off observed performance.

- **Biological Resources*** Intertidal and Subtidal: Assesses the potential effects on existing beach, intertidal, and subtidal biological resources.
- Surf Resources: Assesses the potential for impacts to existing surf resources.
- **Public/Marine Safety:** Assesses the potential for alterations to public and marine safety processes.

*Per public outreach input (Attachment 3), the Project Team combined the two criteria evaluating the intertidal and subtidal biological impacts into one criterion that assesses all potential biological impacts.

The above criteria were developed by the Project and City Teams, with the public given many opportunities to discuss the appropriateness of the criteria, determine if any criteria were missing, and identify the criteria that were most important to them (see Public Feedback section below and Attachment 3). A thorough analysis of the potential pilot project location was necessary because each segment maintains significantly different trade-offs between the benefits provided and challenges associated with implementing the project. Analyzing each segment with a set of consistent criteria enabled the segments to be compared to one another. With the multiple criteria distinguished and individually scored, the aim was for the Siting Analysis to be completed as objectively as possible to aid the City Council in deciding on the pilot project location.

Recommended Siting:

Following extensive analysis, staff recommends that the City Council approve the preferred pilot project siting in Segment 1. This recommendation is based on the results of a multiple criteria evaluation that was performed for the three distinct coastal segments.

All of the segments were scored on a scale of 1 to 5 for each criterion, with a five (high score) typically representing the most beneficial result that satisfies the criterion's objectives and a one (low score) typically representing the least beneficial result with a poor chance of satisfying the criterion's objectives. Segment 1 received the highest score when all criteria were aggregated. A summary of the multi-criteria analysis and background scoring rationale is provided in Table 1 with scores for each segment in Figure 3.

 Table 1. Multi-criteria Analysis Summary Table

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Criteria	Basis of Evaluation	Assumptions
Creation/ Restoration of Beach over Design Life	Overall performance of the system, pertaining to the long-term creation/restoration of a beach between the headlands.	This criteria assumes that funding is available to ensure the project will meet or be adaptable to meet its set performance goals over its 20-year lifespan.
Sediment Supply to Adjacent Beaches	Pilot's impact to the sediment supply on downdrift beaches (to the north or south of the project area).	It is assumed that monitoring and management strategies will be established to mitigate any decrease of sediment supply effects. This strategy is anticipated to result in an increase of sediment supply along adjacent beaches, regardless of the pilot's performance. This does not consider the potential challenges of this mitigation, such as sand placement outside of the City's jurisdiction or cost.
Property Risk Assessment	Risk and uncertainties associated with the pilot negatively affecting shoreline assets, both public and private property.	If the pilot negatively affects the project site, it is assumed the City's legal risk increases in proportion with the number of private properties exposed.
Private/ Public Property Entitlements	Consideration of land connections to the headlands. Ability to acquire the appropriate permissions and right of way for construction and long-term access, operation, maintenance.	This criteria assumes the design dimensions of the pilot with width of 150 ft are the same regardless of segment or site placement. This criteria does not include the offshore reef.
Constructability	Feasibility of the initial construction of the pilot, including the headlands, and reef.	Funding considerations and concerns are not included in this criteria since it is assumed that enough funding will support construction at any site. It is assumed that the contractor would first want to build the beach and then lay the staging area directly adjacent to the work site on this wide elevated surface. Reef construction is assumed to be entirely offshore and therefore would require the same level of effort regardless of the segment.
Construction Costs	Initial construction cost of the headlands and offshore reef.	Costs include potential property negotiations and cost of constructing public headland along private shoreline armoring. Costs for the material required by the headlands and reef are assumed to be the same at all of the segments.
Adaptive Management	Anticipated adaptive management considerations including long-term access for equipment on the beach, public right of way, and readily accessible regardless of beach conditions.	It is assumed that constraints for adaptive management are primarily associated with heavy equipment access and any public/private property boundary considerations. It is assumed that access would be needed even during severely eroded beach conditions.
Biological Resources - Intertidal & Subtidal	Effect of project on existing beach, intertidal, and subtidal biological resources.	It is assumed that direct burial of boulder, reef, kelp, and surfgrass areas presents greater impacts than converting sand bottom habitat or cobble areas to rocky habitat. It is assumed that any habitat conversion and environmental impacts would be mitigated based on monitoring and management strategies, such as efforts to enhance biodiversity and viable habitat being incorporated into the project design or in a nearby mitigation reef.
Surfing Resources	Effect of project on existing surf resources.	A segment with high surf quality and a higher number of users would represent an area with a greater potential for negative change. Whereas a segment with an existing low surf quality and low number of users would represent an area with a greater potential for positive change.
Coastal Access and Amenities	Project is supported by adjacent public features and amenities. These include existing parking lots, vertical and lateral public accessways, lifeguard facilities, restrooms and showers.	It is assumed that permanent pedestrian public access to the headland is available at all of the segments, and the criteria prioritizes more formalized access to headlands and accessways between headlands.
Public/ Marine Safety	Ability to preserve safety of beach and ocean recreation within the project area.	It is assumed that lifeguard towers would be placed on top of each headland site, increasing the lifeguards' ability to staff additional locations and thereby enhancing public safety opportunities. Potential project effects like regular formation of rip currents are assumed to be mitigated by lifeguard accessibility to the project area (vertical and lateral).

Segment 1 is the staff recommended location for the pilot project because it reflects several high scoring criteria, with an overall total of 91% of the possible total score. Segment 1 encompasses 89% public property fronting the ocean, resulting in a majority of the project components (96%) being built within and adjacent to public property that is already owned and managed by the City and/or considered to be public trust lands. This higher percentage of public property frontage significantly reduces potential challenges to approvals, negotiations with private property owners, and risks for implementing the pilot project. In Segment 1, constructability, associated costs and future adaptive management of the structures and beaches all scored high due to the positioning of a public coastal access road (i.e., The Strand) immediately adjacent to the project components providing relatively easy access for construction equipment. Additionally, coastal access amenities and the continuity of lateral beach access for marine safety activity in Segment 1 provide a high score due to the abundance of existing public amenities and services, allowing for the pilot project to be tested in a location that could readily shoulder the expected increase in use from the beach-going public.

Segment 1, however, scored lower on the "surfing resources" criteria due to a higher potential for effects on existing surf resources. With the reef placed in the center of the headlands, the distance of the surf resources from the reef is approximately 0.5 miles, which would likely limit any possible negative effects that the reef could have on surf resources at the Oceanside Pier. The reef and its relative effects on the surf around the structure will be extensively studied through numerical and physical modeling in the final engineering phase. The reef will be designed to minimize surf impacts while still promoting sand retention. Sand bar development on the north and south sides of the reef is expected and would likely have a positive effect on surf amenities, as sand bars tend to enhance

surfing conditions.

Segment 2 and 3 consistently scored lower than Segment 1 in six out of eleven criteria. Segment 2 and 3 only had a two criteria scores (biological resources and surfing resources) that were higher than Segment 1. In terms of backshore conditions, approximately 29% of Segment 2's extent is comprised of public property, and Segment 3 contains approximately 13% public property. However, given the preferred layout for the headland locations, approximately 62% of Segment 2's project features and 31% of Segment 3's project features would lie along public property.

Segment 2 scored well for constructability because it provided multiple land-based equipment access points and contained potential staging areas nearby, while Segment 3 only provided one limited land-based equipment access point through the City of Carlsbad right of way. Segment 2 includes land-based access and one adjacent and multiple nearby potential staging area, so it is expected to have a relatively intermediate construction cost. Segment 3 is anticipated to have the highest construction costs due to connections along private shoreline armoring, and constraints of nearby land-based access and staging areas. Segment 2 provides readily available access for heavy equipment at Oceanside Boulevard through a public street access ramp, and public infrastructure at Wisconsin Avenue Segment 3 contains relatively high constraints at both headlands with only one limited land-based equipment access point.

Segment 2 has similar subtidal resources to Segment 1 but lacks established sandy beach habitat. Segment 3 lies directly north of an identified rocky reef area with diverse habitat communities that could be impacted by the pilot activities, while also containing limited existing sandy beach habitat. Since Segments 2 and 3 contained lower levels of existing surf resources with a greater potential for positive change, they received high scores for the surf resources criterion. Segment 2 and 3 provided multiple coastal accessways, including two directly to each headland, but contained a relatively lower number of amenities accompanying them compared to Segment 1. Segment 2's marine safety is considered to provide similar levels of lifeguard access as Segment 1 given the access ramp at Oceanside Boulevard and its distance to the lifeguard headquarters at the pier. While Segment 3 contained no existing vehicle access points and was the furthest from the marine safety center, it was assumed that a relatively high level of marine safety efforts would still be able to be maintained.

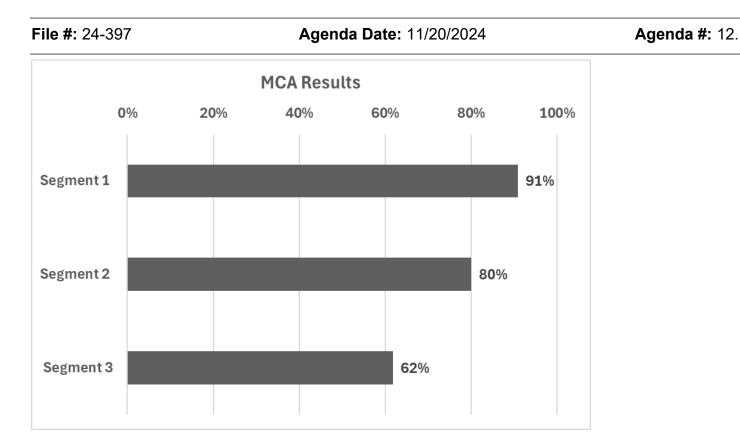


Figure 3. Results of Multi-Criteria Analysis (MCA) for each Segment

Public Feedback

The Public Outreach component of the Siting Analysis had three core objectives:

- (1) To educate the community about the RE:BEACH Oceanside pilot project and the criteria used for site analysis;
- (2) To share the preliminary results of the siting analysis and preferred layouts for the pilot project based on the analysis; and
- (3) To solicit feedback on the methodology, criteria used, and the site selection process.

The siting outreach began with two public webinars conducted in July 2024. The webinars provided the public an opportunity to hear directly from the Project Team about the criteria and process used to determine recommended layouts for the pilot project components, review the preliminary recommended layouts, discuss the multi-criteria analysis being used to provide a Segment recommendation, and ask general questions about the project and the siting analysis. The webinar materials and a recording of the webinar were made available on the project website (rebeach.org). Following the webinar, participants were asked to take a short survey so they could pose any additional questions they had on the criteria and the analysis, as well as share if they thought the Project Team should be considering any additional criteria. This survey was opened from July 22 to October 7, 2024. Throughout the summer, the Project Team also participated in outreach at several

pop-up events, including at three Oceanside Farmer's Markets, the Super Girl Surf Contest, the Oceanside Boardriders Northside Shootout, and an Oceanside Museum of Art exhibition event. The Project Team announced these tabling events in advance utilizing the City of Oceanside's Tide Newsletter, sharing widely on social media channels and through the RE:BEACH email list-serv.

Public feedback on the siting analysis criteria is described in detail in the RE:BEACH Siting Analysis Community Input Summary (Attachment 3). The Project Team has identified high level themes through the community feedback, with responses to these comments below:

- 1. The siting analysis should elevate the consideration and relative importance of surfing resources. The revenue from surf contests should be considered in the criteria.
 - a. The Siting Analysis includes a criterion that assesses the potential of the pilot project to impact surf resources, based on the baseline quality of surf and number of surfers typically observed in the area. A segment with high surf quality and a higher number of users represents an area with a greater potential for negative change. Whereas a segment with an existing low surf quality and low number of users represents an area with a greater potential to be affected by the pilot. It is assumed that any increase in sediment in Segments 1, 2 or 3 would improve surf resources relative to their current compromised condition. The potential for surf resource impacts includes an analysis of use, which includes surf contests; through this Siting Analysis each Segment has been evaluated to account for changes to surf resource use.

2. The Siting Analysis should further consider the impact (both negative and positive) on marine life.

- a. The Siting Analysis includes a criterion that considers the potential negative impacts from burying existing subtidal habitat, and the potential for the pilot project components to influence habitat conversion. Additionally, the Project Team will consider design elements that could potentially positively impact coastal and marine life in the next phase of design, after the project location has been selected.
- 3. The Siting Analysis should be considering the fact that there are no beaches in some places, and should prioritize areas most in need of repair/ impacted by erosion.
 - a. In general, areas south of the Pier have been prioritized as areas of Oceanside's coast that have experienced exacerbated erosion; thus, the pilot project is planned for one of the three prioritized Segments. The Siting Analysis considers the project's ability to enhance and leverage existing public features and amenities. Some areas of Oceanside that are most impacted by erosion do not have the same level of public access features (e.g., parking lots, public accessways, restrooms, showers, etc.). Furthermore, the Project Team considers these public amenities as fixed, and therefore measurable in this Siting Analysis, while beach conditions are dynamic, and cannot be measured consistently.
- 4. The Siting Analysis should consider return on investment.

- a. While difficult to estimate the exact return on investment, the Siting Analysis uses criteria that considers public access and surfing resources, which can represent opportunities to boost the local economy in the City, while also accounting for construction cost and feasibility. All criteria are included to provide the best assurance that the pilot project will be successful and provide a net benefit to the community of Oceanside.
- 5. The Siting Analysis should determine the extent of public access space necessary at various locations.
 - a. The Siting Analysis assumes that headlands should connect with public accessways and facilitate both public and emergency service access for each proposed segment and layout. In addition, the Siting Analysis includes criteria that considers the ability to enhance and leverage existing public accessways.

Ongoing Coastal Monitoring and Management Efforts

While it is recognized that RE:BEACH is a pilot project for a specific geographic location, the intent of the pilot is to determine the viability of the proposed novel sand retention concept for use in additional areas throughout Oceanside's coastline. A robust monitoring program, to be established under the Phase 2 Project contract, will inform our knowledge about the performance and scalability of the RE:BEACH design. As monitoring commences, continual attention to coastal erosion will be undertaken through the City's broader Coastal Management Program. Ongoing coastal management efforts that extend beyond RE:BEACH include, but are not limited to:

- Utilization of the Sand Compatibility Opportunistic Use Program (SCOUP) permits and placement of opportunistic sand
- Development of dunes on the back beach in coastal areas where dry sand currently persists and that are subject to either sand management needs or intermittent flooding;
- Participation in regional sand nourishment efforts through SANDAG;
- Removal of impediments in San Luis Rey river mouth to allow for natural sediment flow to the littoral cell; and
- Pursuit of funding and environmental compliance for execution of the Buena Vista Lagoon Enhancement Project.

The City's current SCOUP permits enable the placement of beach compatible sand that could become available through site excavation associated with certain coastal development projects or anticipated coastal habitat restoration projects. Receiver beaches for SCOUP sand include coastal zones from Seagaze Street to Pine Street (Northern Receiver Site) and Oceanside Boulevard to Buccaneer Beach (Southern Receiver Site). Several SCOUP opportunities are currently being evaluated for feasibility, with the Buena Vista Audubon Society's Coastal Wetland Restoration & Resiliency Project potentially yielding opportunistic sand to the Southern Receiver Site as early as fall 2025.

Coastal dunes are natural sand retention mechanisms that provide a buffer between the ocean and public/private infrastructure, while providing habitat and an opportunity for building natural resilience against sea level rise and changing climatic conditions. Coastal dunes are being designed and

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installed in areas that currently sustain dry sand beaches in northern Oceanside, allowing for acquired resources, like sand and funding, to be focused in areas that are currently in a more eroded condition.

The Regional Beach Sand Project (RBSP) III, led by SANDAG, is currently wrapping up the feasibility phase (expected completion in March 2025). Once feasibility is complete, the RBSP will move into design and permitting, followed by construction. SANDAG currently estimates that, with adequate funding, RBSP could possibly be installed on regional beaches as early as 2028/2029. Oceanside is expected to receive 1 million cubic yards of sand from this effort, with placement expected to occur in coastal zones from Tyson Street to Witherby Street.

The removal of remnant road bed materials that block natural sand flows from the San Luis Rey river to the Pacific Ocean is currently being evaluated and preliminarily designed. Grants are being sought to enable a thorough assessment of the study area to ensure minimal impacts to wildlife species occurs through this structural removal in the river mouth.

The environmental certification for the Buena Vista Lagoon Enhancement Project occurred in July 2020. Since then SANDAG and the Buena Vista Lagoon Joint Powers Committee have been working toward acquiring the funds necessary for completion of the design and permitting of the project. In addition to the number of environmental and hydrologic benefits afforded from the proposed project, the Enhancement Project could yield upwards of 1 million cubic yards of sand to the beaches of Oceanside and Carlsbad, once constructed.

FISCAL IMPACT

Funding for the Phase 2 Sand Nourishment and Retention Pilot Project has already been allocated and is covered by the American Rescue Plan Act (ARPA) Sand Replenishment Account. Of the \$2.59M authorized for the Phase 2 Project, \$1.48M are left to accomplish the remaining tasks. The Sand Replenishment account 837134221271 currently has an available balance of \$584,069.

COMMISSION OR COMMITTEE REPORT

Does not apply.

CITY ATTORNEY'S ANALYSIS

City Attorney analysis does not apply at this stage. Any future contracts and/or discretionary entitlements will require review by the City Attorney's Office.

Prepared by: Jayme Timberlake, Coastal Zone Administrator Submitted by: Jonathan Borrego, City Manager

ATTACHMENTS:

1. Staff Report

- 2. GHD Agreement
- 3. Siting Analysis