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CDP 5-26-0292 (OCPW, Seal Beach, Huntington Beach, Newport Beach, Dana Point, San Clemente, OC Parks, and California State Parks)

December 10, 2026

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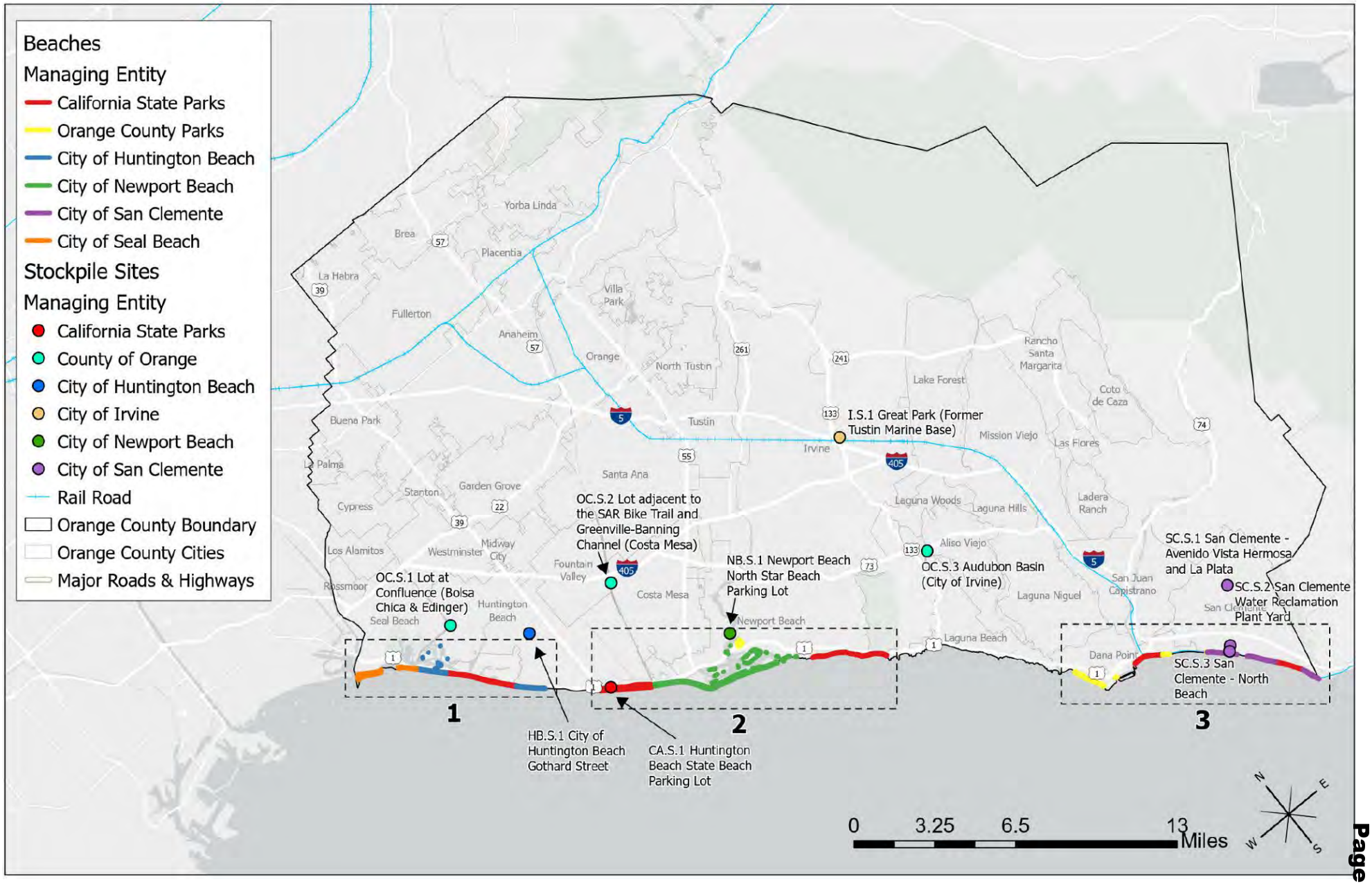

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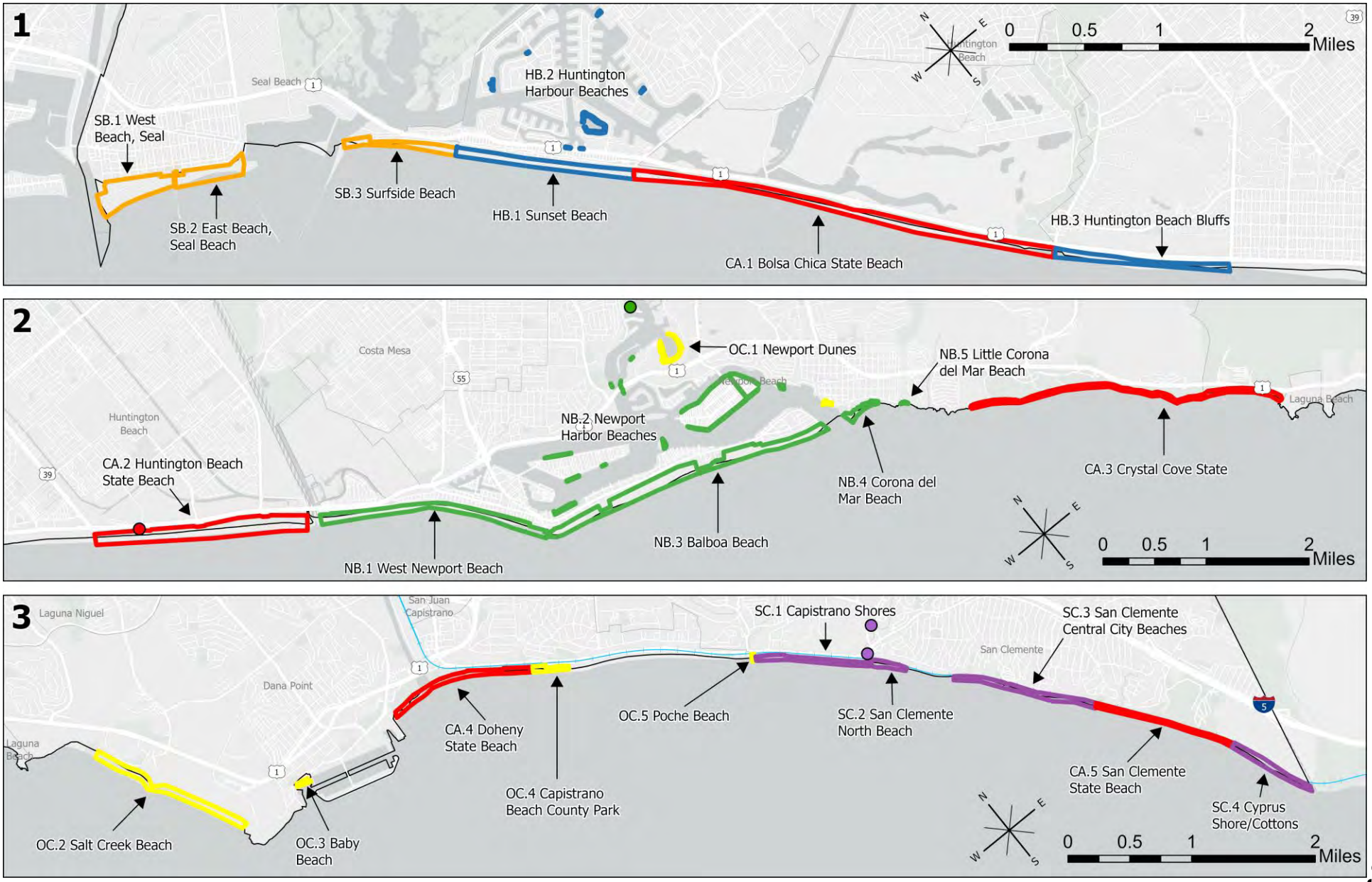

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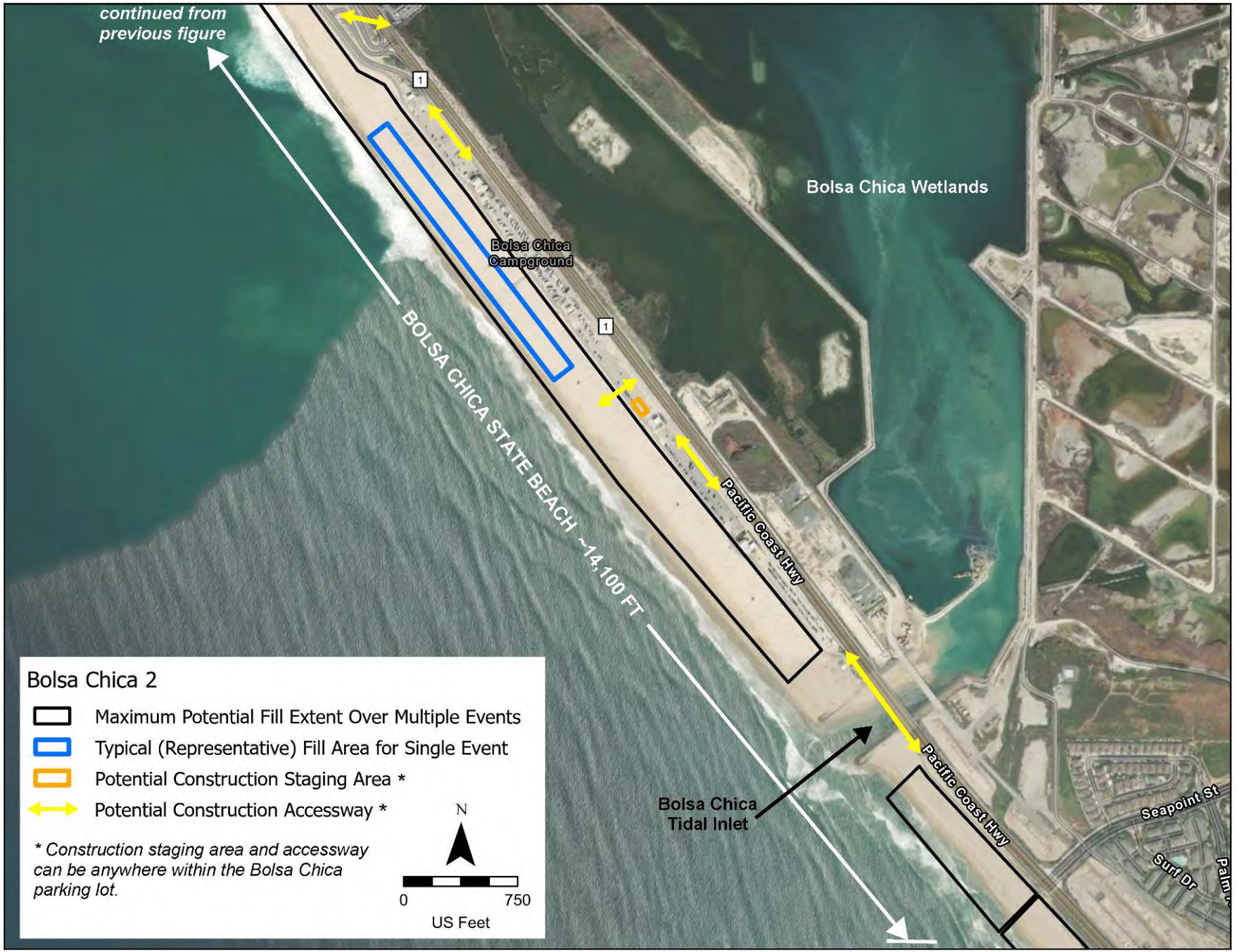

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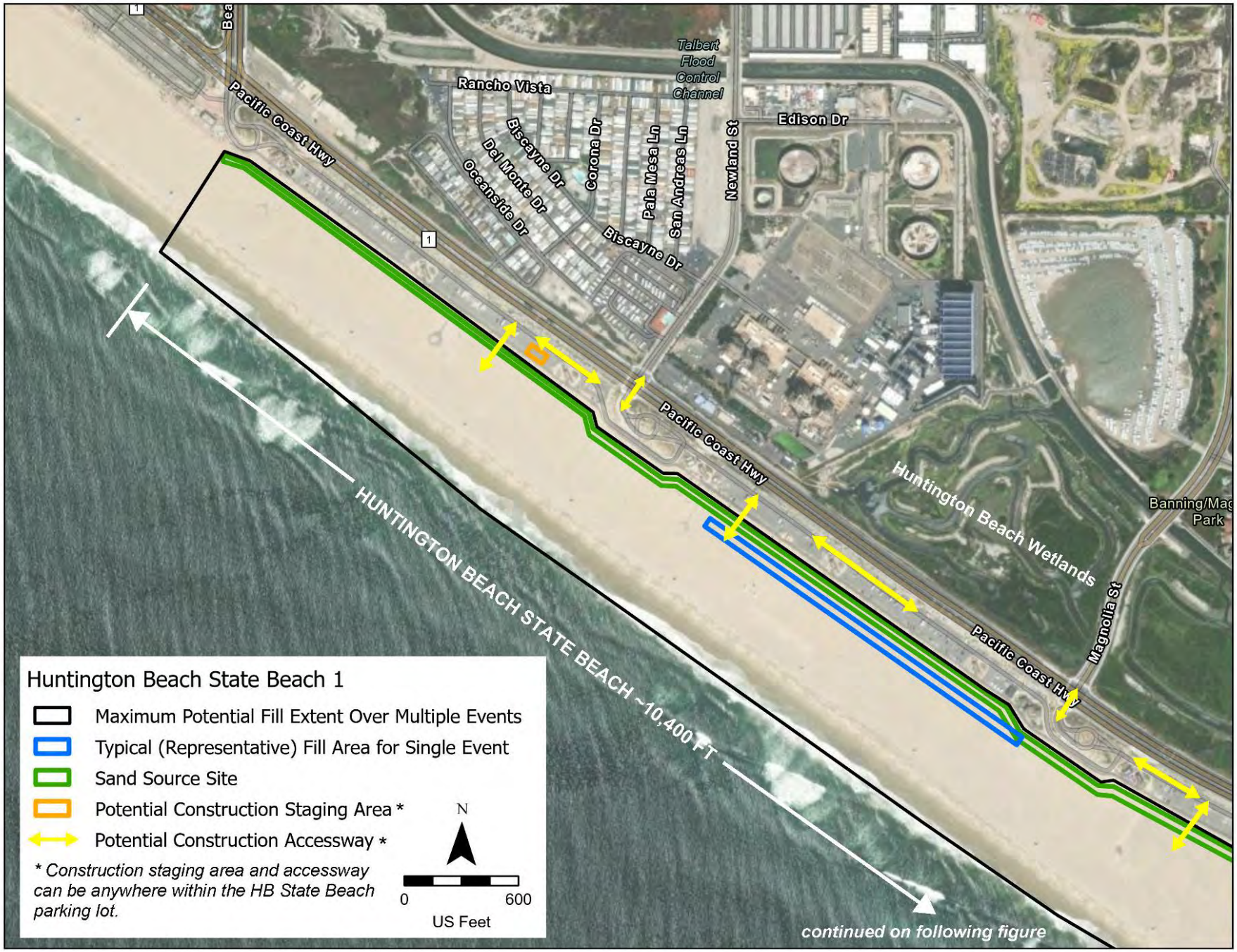

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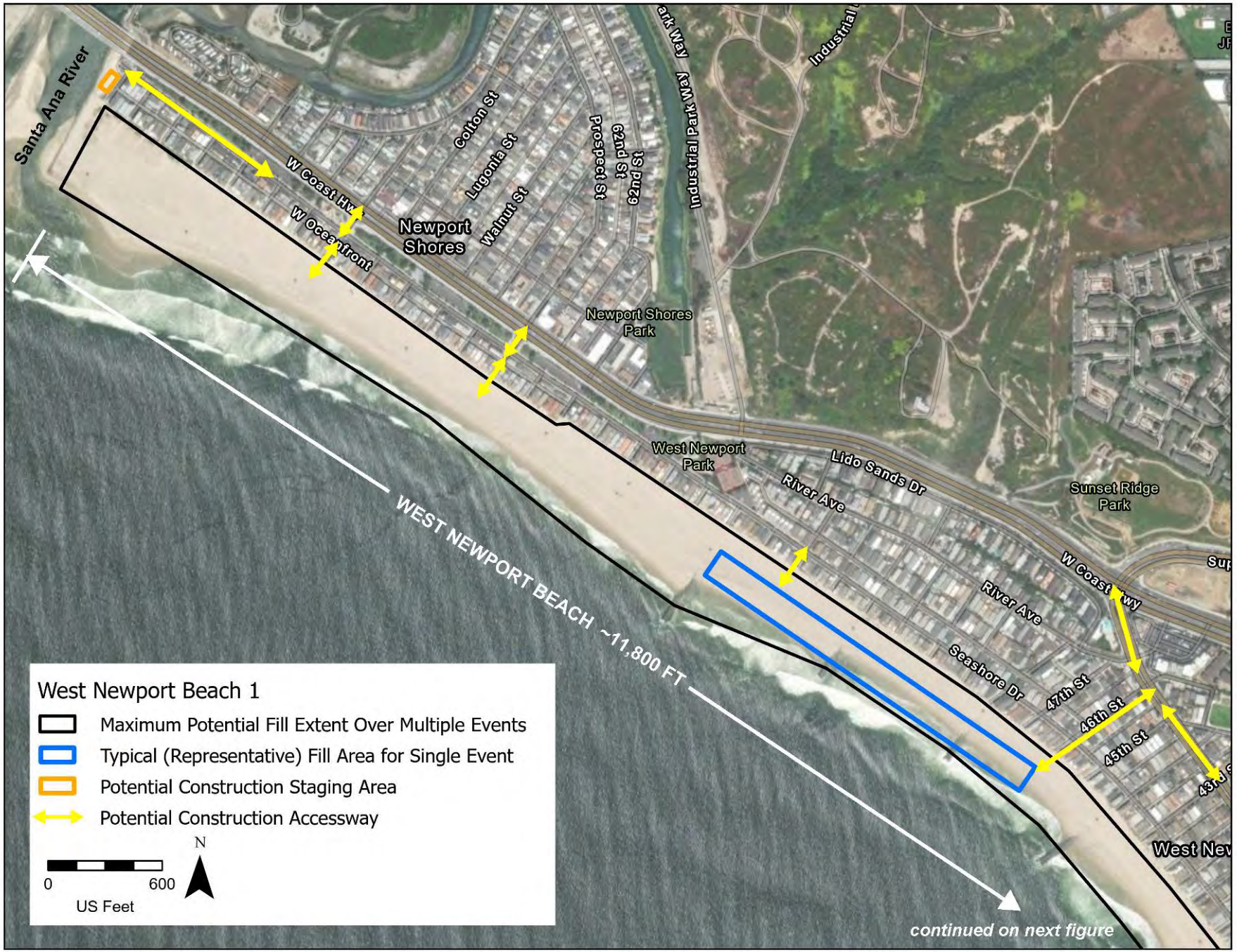

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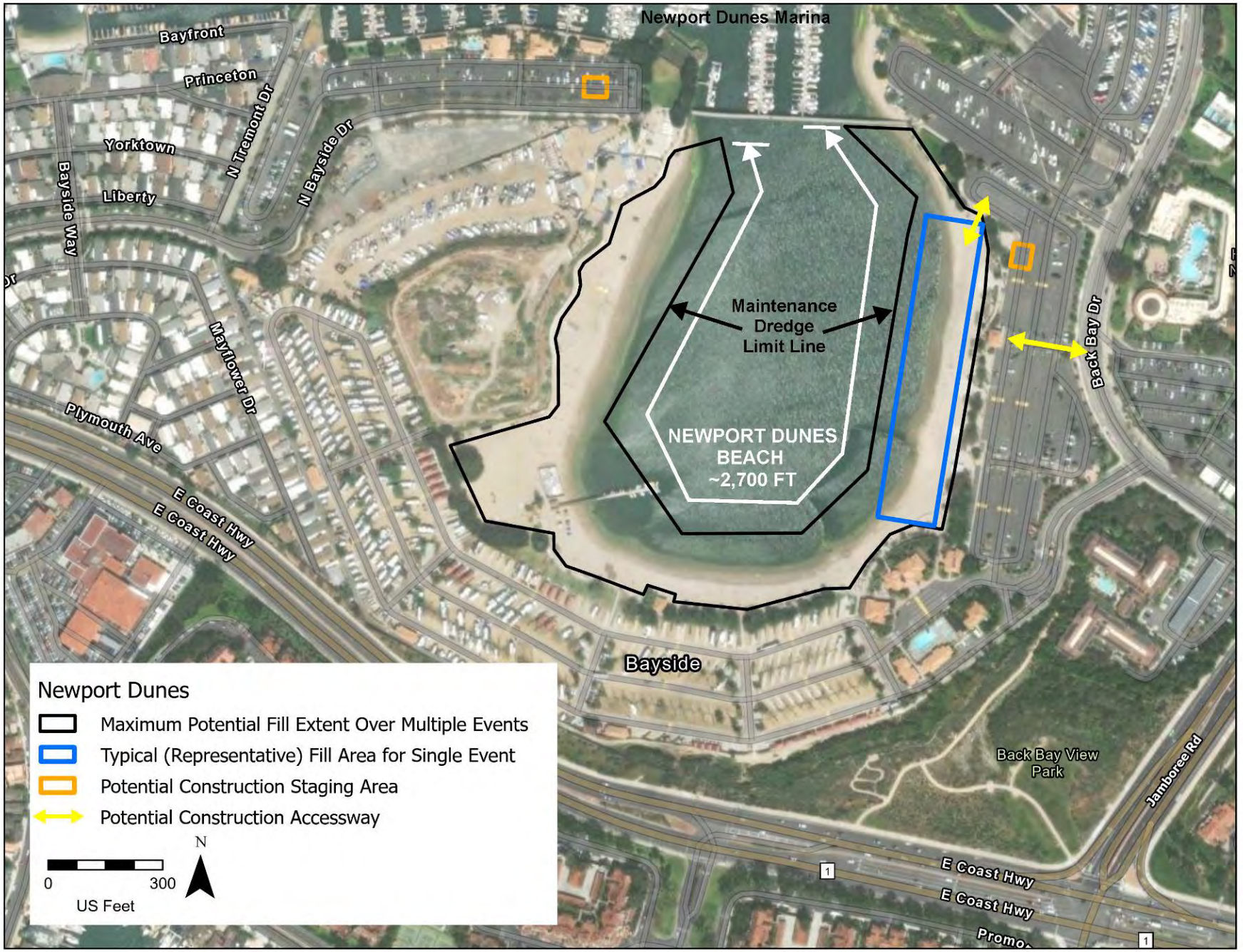

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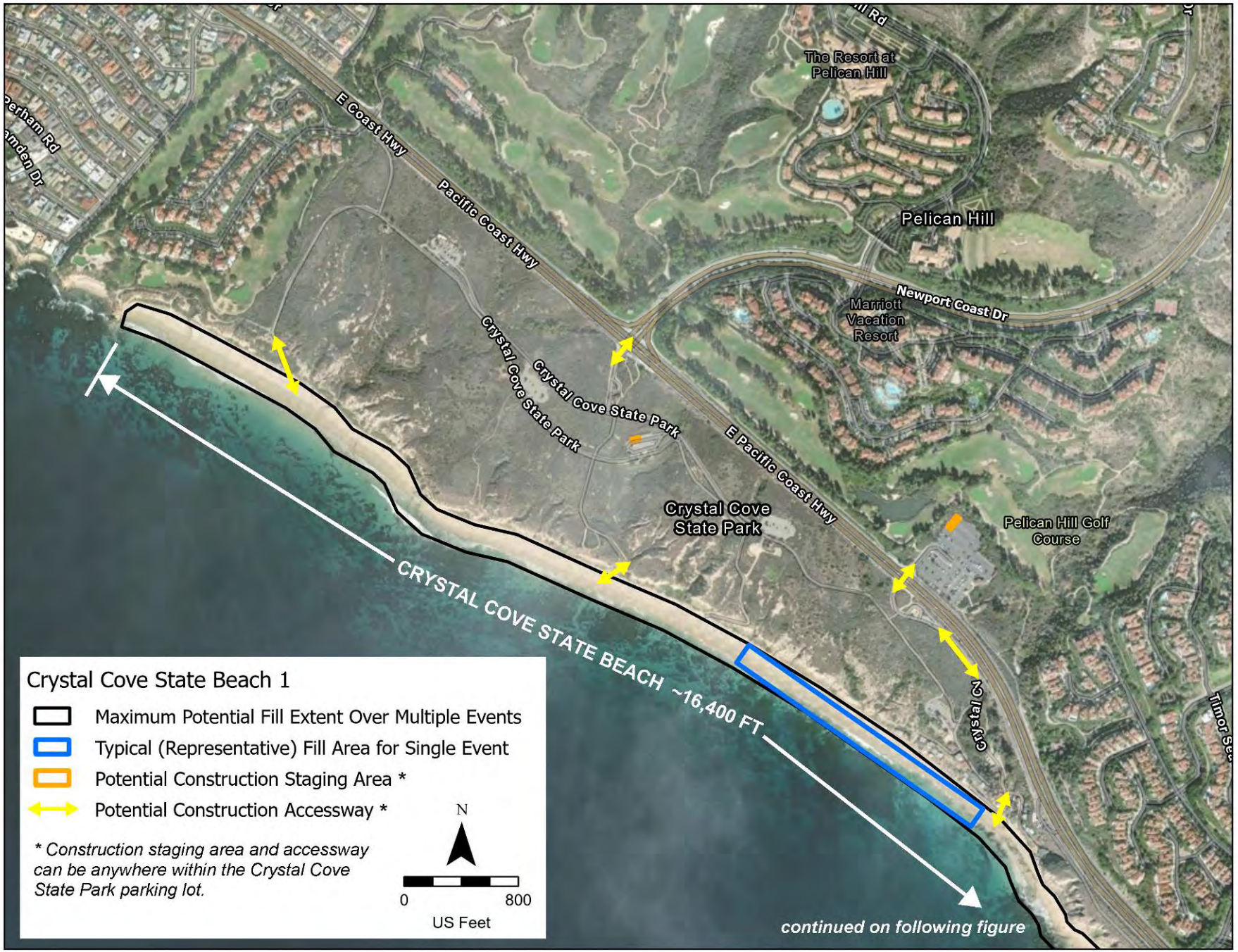

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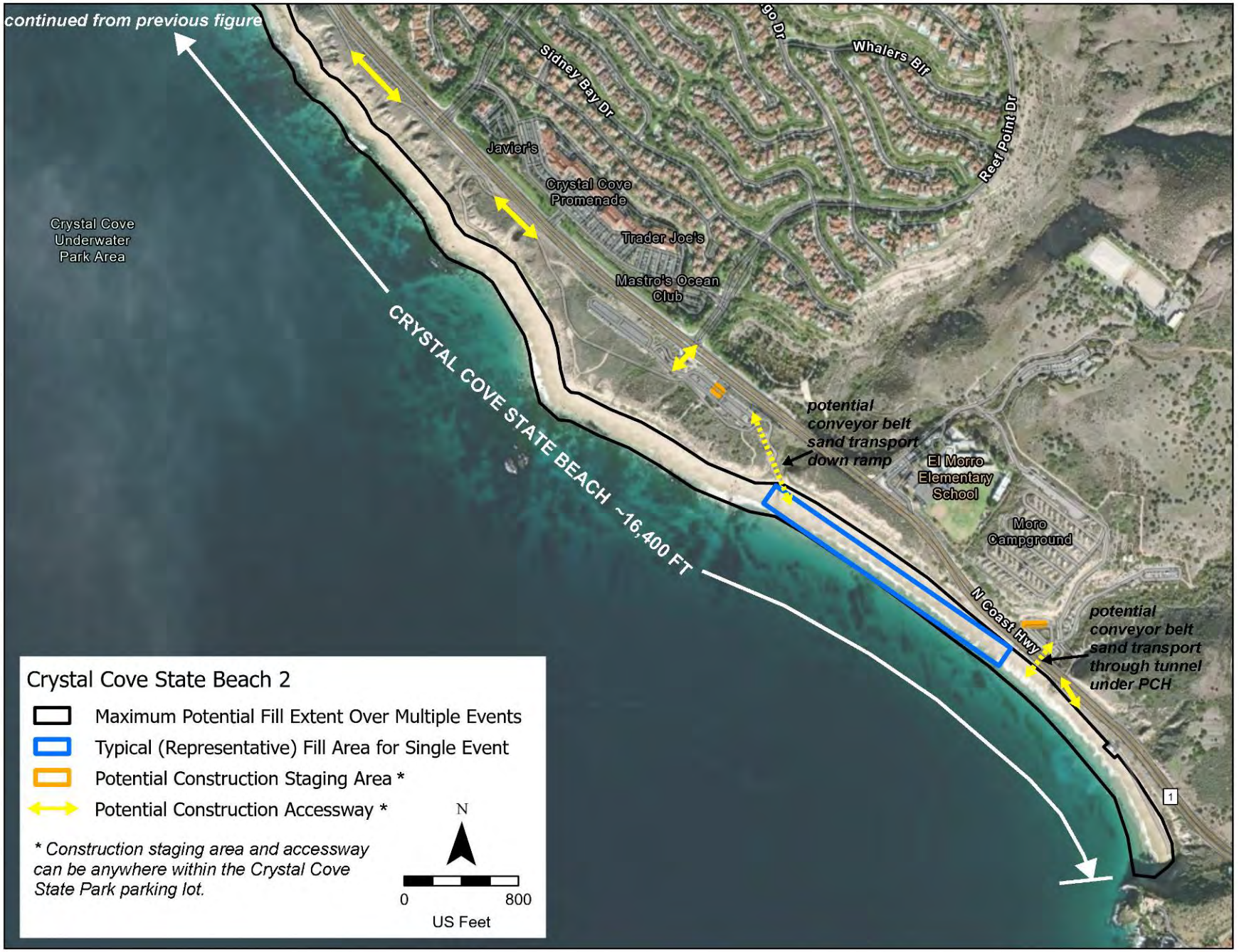

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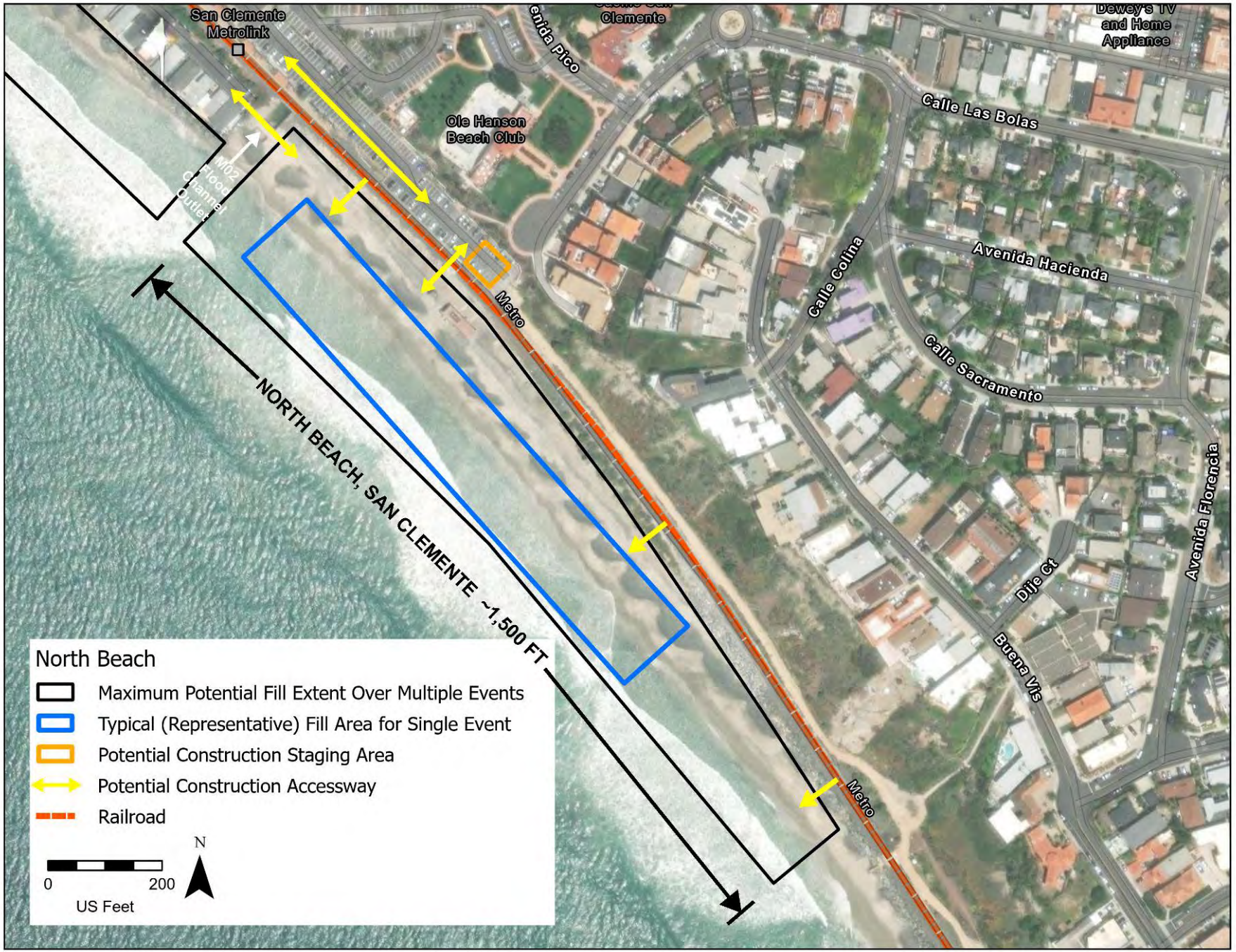

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California State Parks – Receiver Sites

CA.1 Bolsa Chica State Beach

Bolsa Chica State Beach is located at the northern end of Huntington Beach. It is bounded by Warner Avenue to the north and Seapoint Street to the south and Pacific Coast Highway to the east. Amenities include plentiful parking, camping, restrooms and showers, lifeguards, a snack bar, and a beachside bike path. Just across Pacific Coast Highway is the Bolsa Chica Ecological Reserve that has hiking paths and conducts organized tours of the wetland and its inhabitants. Most of Bolsa Chica's visitors are local residents with a few overnight campers and their families.[1] Based on the relatively wide sandy beach but subject to wave runup and overtopping during extreme storm events (such as in January 2023), this is a *MEDIUM* need receiver site.

CA.2 Huntington Beach State Beach

Huntington Beach State Beach is the southernmost of the Huntington beaches, bordered by Pacific Coast Highway to the east, the Santa Ana River to the south, and Beach Boulevard to the north. There is a long and wide sandy beach that offers plentiful parking, volleyball, fire pits, lifeguards, restrooms and showers, seasonal snack stands, and a boardwalk. The crowd here tends to consist of Orange County families who come to enjoy the plentiful amenities and bike along the boardwalk. Although there is no overnight camping, the parking lot will often be filled with RVs. Surfing is less important here than at Huntington City Beach to the north, with the exception of a break at the mouth of the Santa Ana River at the southern end.[2] Based on the Coastal Regional Sediment Management Plan (CRSMP)[3], this is a *LOW* need receiver site.

CA.3 Crystal Cove State Park

Wedged between Corona del Mar and Laguna Beach lies Crystal Cove State Park. There is a north and south entrance to the park, both located to the west of Pacific Coast Highway and each with its own parking and bathroom and shower facilities. Atop the bluff, there is a bike path that parallels the highway connecting the two entrances. At the mid-point is a small cafe crowded with park users and highway passers-by.

Overall, Crystal Cove has parking for up to 400 cars. El Moro campground overlooks the ocean with 27 recreational vehicle and 30 tent sites. Also, guests stay in any of the 21 historical cottages nestled amongst the bluff. From atop the bluff, numerous trails lead down to the beach. The beach consists of three distinct coves with narrow sandy areas and rocky reefs abutting the water. The beach is very popular with overnight visitors and local and county residents year-round. The southernmost cove, known as El Moro, is a popular surfing spot during large summertime south swells, but in the winter is dormant.

Off-season use consists mainly of walking the beach and trail and exploring the rocky point tide pools.[4] Based on the existing narrow sandy beach, this is a *HIGH* need receiver site.

CA.4 Doheny State Beach

Doheny State Beach is located east of Dana Point Harbor, at the intersection of Pacific Coast Highway and Dana Point Harbor Drive. Amenities include lifeguards, a snack bar, bathrooms, showers, volleyball nets,

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[1] *Everest et al, 2013. Orange County Coastal Regional Sediment Management Plan, Prepared for U.S. Army Corps of Engineers, County of Orange, and California Coastal Sediment Management Workgroup, Prepared by Everest International Consultants Inc., in association with Science Applications International Corporation and Dr. Phillip King.*

[2] *Everest et al, 2013*

[3] *Everest et al, 2013*

[4] *Everest et al, 2013*

barbeques, picnic areas, fire pits, and camping areas. The beach is popular year-round with overnight tourists, and local and county residents. There are a few reefs and a river mouth sandbar that produce soft but well-shaped waves that are popular with longboard and novice surfers and also make the waves safe for children.

There is also a large grassy area that is used in the summertime for concerts and events and otherwise is often crowded with visitors playing a range of games. In the park, there are 120 camping sites, and also many hotels in the area.[5] The CRSMP,[6] identified this is a *MEDIUM* need receiver site, however, increased erosion over the past decade has now caused this to be a *HIGH* need receiver site.

CA.5 San Clemente State Beach

San Clemente State Beach can be reached off Avenida Calafia which intersects the Interstate 5 freeway. The park provides around 150 campsites, year-round lifeguard service, and restroom and shower facilities. Trails from the bluff top park lead to the beach. In the summer months, the beach and campground are filled with overnight visitors. In the winter, mostly local surfers remain. Where Avenida Calafia terminates near the beach is the San Clemente State Beach - Calafia.

The state provides a metered parking lot of 190 spots, a restroom and shower facility, and seasonal food and lifeguard service. The beach here is narrower than the beaches to the north or south, nevertheless due to the available amenities it is heavily populated by local, county, and tourist beachgoers when the weather is favorable. In the winter, surfers remain.

The San Clemente Inn is just a few blocks from this beach, and a few other hotels are located east of the freeway.[7] The railroad runs along the back of the beach. Based on the existing beach widths and its “Stable” rating[8], this is a *MEDIUM* need receiver site.

California State Parks – Stockpile Sites

CA.S.1 Huntington Beach State Beach Parking Lot

The backbeach area along Huntington Beach State Beach will also be considered as a sand source site. The wind-blown sand would be stockpiled within the parking lot (?), for potential use at other beach receiver sites.

Orange County Parks – Receiver Sites

OC.1 Newport Dunes

The Newport Dunes Waterfront Resort is located in Upper Newport Bay and is owned by OC Parks. The resort includes a public beach, aquatic park, marina, RV camping, and resort amenities. The Newport Dunes marina and lagoon are periodically dredged, and the dredge material is disposed at an offshore open ocean site. Based on existing conditions, this is a *LOW* need receiver site.

OC.2 Salt Creek Beach

Salt Creek Beach County Park includes the beaches of Salt Creek Beach and Dana Strands (aka “Strands Beach”). This is a popular year-round beach. It is located west of Pacific Coast Highway at the foot of Niguel

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[5] *Everest et al, 2013*

[6] *Everest et al, 2013*

[7] *Everest et al, 2013*

[8] *Moffatt & Nichol, 2023b*

Road and receives the majority of South Orange County residents pouring to the nearest beach from inland communities. It has over 1,000 parking spots and a variety of amenities are there to accommodate visitors.

The beach includes a seasonal snack bar and lifeguards, bathrooms and showers, a large grassy area with picnic areas, volleyball courts and a basketball court. Salt Creek is also an important beach for surfing and bodyboarding. The majority of visitors are from Orange County communities, but the beach also has a consistent flow of overnight tourists; the Ritz Carlton is located just above the beach and the St. Regis just across the street. The southern portion of the beach, known as Dana Strands, has a funicular elevator to shuttle patrons down the steep bluff to the beach.[9]

The majority of Salt Creek Beach is owned/managed by OC Parks, with the exception of a small segment of shoreline at the far south end owned by the City of Dana Point. Based on the existing sandy beach width, this is a *MEDIUM* need receiver site.

OC.3 Baby Beach

At the northern end of Dana Point Harbor, southwest of Dana Point Harbor Drive, is a small sandy beach circumvented by a series of grassy areas and a small parking lot. Buoys denote a small swimming zone. This beach is mainly used by tourists and county residents who come to picnic while children swim safely in the still water. Kayak rentals are also available, and the beach serves as a safe and useful place to launch. Restroom and seasonal lifeguard service is provided, and the snack bar at Dana Cove Beach is a short walk away. In the winter, attendance drops significantly.[10] Based on the CRSMP[11], this is a *LOW* need receiver site.

OC.4 Capistrano Beach County Park

Capistrano Beach County Park is located directly west of Coast Highway on Beach Road. The narrow beach is used mostly by county residents and overnight tourists from the nearby hotels. In the summer, amenities here are plentiful and the waves are calm, attracting families who can safely swim. A large parking lot provides metered spaces.[12] Based on the CRSMP[13], this is a *HIGH* need receiver site.

OC.5 Poche Beach

Poche Beach is a little pocket beach at the very south end of Dana Point, in between the private homeowner communities of Capistrano Bay District and Capistrano Shores. Within the beach area, Poche Creek (or Prima Deshecha Cañada storm drain) empties to the ocean. Accessing this beach is difficult as there is no parking on this section of Pacific Coast Highway nor El Camino Real and surrounding communities are gated. Based on the narrow sandy beach, this is a *HIGH* need receiver site.

Orange County Parks – Stockpile Sites

OC.S.1 Lot at Confluence (Bolsa Chica & Edinger)

The stockpile site at the confluence of the C02/C04 (Bolsa Chica and Edinger) flood control channels is located in northern Orange County (within City of Huntington Beach) at the corner of Bolsa Chica Street and Edinger Avenue.

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[9] *Everest et al, 2013*

[10] *Everest et al, 2013*

[11] *Everest et al, 2013*

[12] *Everest et al, 2013*

[13] *Everest et al, 2013*

The site has two segments. The first, roughly triangular site is bordered by the flood channels to the north, west and south, and Bolsa Chica Street to the east. Current items being stored at this site include rock riprap, sandbags, fencing, barricades, traffic cones and stop signs. The long and narrow second site is a maintenance dirt road. It runs parallel to and is bordered by Edinger Avenue on its southern side and a stream to its northern side. Combined, the two sites span an area of roughly 23,000 square yards (4.8 acres).

OC.S.2 Lot adjacent to the Santa Ana Bike Trail across from OC Sanitation District (Costa Mesa)

The D03 D/S California @ E01 Bike Trail stockpile site (Figure 4-8) is located just south of the 405 freeway, bordered to the west by the Santa Ana River ("E01") and to the east by the Greenville-Banning flood channel ("D03"), within the City of Costa Mesa. It is 4 miles upstream of the Santa Ana River ocean outlet. The site is accessible by a gated access road, controlled by Orange County Public Works, off of California Street. The available stockpile capacity is very limited with a surface area of roughly 1,000 square yards (0.2 acres). Current items being stored at this site include sandbags, fencing, barricades, traffic cones and stop signs.

The site's relative proximity to the coast, and latitudinal location makes it a suitable storage location for nourishments at north county receiver beaches such as Huntington Beach Bluffs (7 miles away) and West Newport Beach (7 miles).

Historically, the triangular site that borders Edinger Avenue and Bolsa Chica Street has been utilized more for storage than the dirt road. However, it is likely the dirt road will be utilized more in the future as there have been previous noise complaints at the triangular site from homeowners to the east of Bolsa Chica Street as a result of construction vehicles depositing material into the site. These past complaints arose from the deposition of larger, bulkier items such as rock riprap, which generates significantly more noise than sand. Therefore, the first triangular site should still be considered as an option for this program.

OC.S.3 Great Park (former Tustin Marine Base)

This potential stockpile site (Figure 4-10) is a large plot of undeveloped land owned by Orange County Public Works, located in the City of Irvine, near the former Tustin Marine Base. The site is bordered by Marine Way to the north, an Orange County Transit Authority yard to the west, and other undeveloped plots of land to the south and east. The site has the most storage availability of any of the identified stockpile sites, with a surface area of roughly 47,500 square yards (9.8 acres).

Additionally, the site is located in a fairly unpopulated area, relatively distant from residential properties and not near any major streams, storm channels, or other environmental areas. A significant pro of this site is the adjacency to the rail line, which opens the possibility of utilizing train transport of sand from this site to the beaches.

OC.S.4 Audubon Basin (City of Irvine)

The Audubon Basin, I02B01 site (Figure 4-9) is a stormwater detention basin maintained by Orange County Public Works. It is located directly southeast of the California Highway 73 at the intersection with El Toro Road within the City of Aliso Viejo. Storage is available directly south and east of the basin along a dirt access road. The site has moderately available storage area with a surface area of roughly 5,500 square yards (1.1 acres). Current items being stored at this site include sandbags and rock.

The site's relative proximity to the coast, and latitudinal location makes it a suitable storage location for nourishments at south county receiver beaches such as Doheny and Capistrano Beaches (10 miles away). Additionally, the site is located in a fairly unpopulated area, relatively distant from residential properties.

City of Huntington Beach – Receiver Sites

HB.1 Sunset Beach

Sunset Beach is a residential community, within the City of Huntington Beach, with a wide sandy beach that offers free parking, restrooms and showers, lifeguards, and volleyball courts. Beach activities such as surfing, windsurfing and kite surfing dominate water sports, and many visitors can be found simply enjoying the sand and sun. There are numerous hotels in the area and many beach users are overnight tourists or visitors from Orange and Los Angeles Counties. There are a few restaurants in the immediate area.

HB.2 Huntington Harbor Beaches

Huntington Harbor contains a small number of pocket beaches; some accompanied by parks and play areas. These beaches are used primarily by local residents and visitors to the marina. Recreational amenities such as lifeguards are very limited. Access is also difficult for non-residents. Kayak Beach is along Pacific Coast Highway and is a popular launching area for kayakers and standup paddleboarders. Based on the relatively lower erosion rates of Huntington Harbor beaches, these are *LOW* and *MEDIUM* need receiver sites.

HB.3 Huntington Beach Bluffs

Huntington Beach Bluffs, also known as Dog Beach, is along the northern section of Huntington Beach, bordered by Seapoint Avenue to the north and Goldenwest Street to the south. This is one of the few locations in Orange County where dogs are allowed on the beach without a leash. The beach is very popular year-round with local residents and their pets. It is also popular with surfers attracted to the waves, which tend to be larger here than other nearby local beaches. Amenities are metered parking, seasonal lifeguard service, restrooms, and a pedestrian/bicycle trail. Huntington Beach Bluffs is owned by the California State Parks, but is maintained/managed by the City of Huntington Beach via a Lease of State Lands. Based on the CRSMP[14], this is a *HIGH* need receiver site.

City of Huntington Beach – Stockpile Sites

HB.S.1 City of Huntington Beach Gothard Street

This potential stockpile site is a fenced area owned by the City of Huntington Beach and currently used by the City for staging and stockpiling for its Capital Improvement Project. It has a surface area of roughly 4,500 square yards (0.9 acres). A key advantage of this site is its proximity to main transit ways.

City of Newport Beach – Receiver Sites

NB.1 West Newport Beach

West Newport Beach is located to the west of Pacific Coast Highway, immediately south of Huntington Beach. Homes and condos align the landward edge the sandy beach. The beach offers volleyball courts, showers, and seasonally operated lifeguard towers. In the winter, when lifeguards are off duty, the surf and sand are observed by cameras atop each tower and a jeep patrol.

This is also the case for the beaches to the south. The beach is a popular surfing destination. At the middle and southern end of the beach, eight rock jetties spaced about 300 feet apart (the “Newport groin field”) inhibit sediment migration, creating reliable sandbars, making the waves break hollow, and attracting surfers.

A grassy park inland of the homes, along Pacific Coast Highway, provides metered parking, restrooms, playgrounds, picnic tables, and at the southern end, racquetball, basketball, and tennis courts. Across Pacific Coast Highway are restaurants and hotels. This beach swells with tourists and locals in the summer

[14] *Everest et al, 2013*

and attracts a reduced but still consistent crowd in the winter, mostly local surfers, joggers, and families utilizing the park. A boardwalk extends along the peninsula which is heavily utilized by bikers and walkers year-round.[15]

At the southern/eastern limit of this area is Newport Pier and McFadden Plaza, where there are numerous shops and restaurants, a bathroom and shower facility, a boardwalk, a playground and grassy area, and metered public parking. Based on the CRSMP[16] this is a *MEDIUM* need receiver site.

NB.2 Newport Harbor Beaches

There are 32 small beaches (including China Cove, Balboa Island, Harbor Patrol, Bayside Village Marina, Balboa Marina, as well as others) located within Newport Harbor and Newport Bay. Of these 32 beaches, two are owned/maintained by the County of Orange and the remaining are owned/maintained by the City of Newport Beach or within private islands. The beaches within the harbor are accessible mostly by residents of the homes adjoining the private docks, people who rent the houses seasonally, or members of a local yacht club. A study of visitation patterns on Balboa Island concluded that most (57 percent) visitors were local residents.

Attendance at these beaches is limited and concentrated mostly on the beaches with better access and lifeguard services. Many of the sandy stretches are quasi-private and the frequent boat lines and docks also limit access and recreational value as does the water quality inside the harbor and the narrow beach width. This area contains a number of smaller beaches that have limited amenities and host perhaps 10,000 – 15,000 visitors per year, mostly in the summer.

China Cove is located on the east side of Newport Harbor Entrance Channel, northwest of Corona del Mar State Beach. There are two small sandy coves, separated by a row of houses that are both accessible via Cove Street or a footpath from Ocean Boulevard, where visitors must park. Other than a seasonal volleyball court in the east cove, there are no amenities here. The beach is located within the harbor and the waves are calm, so it serves as a useful launching point for kayaks or small watercraft. The beach is mostly used by locals and in the winter the crowd drops to sporadic walkers and kayakers.[17]. Based on the CRSMP[18], beaches within Newport Harbor are *HIGH* and *MEDIUM* need receiver sites.

NB.3 Balboa Beach

Balboa Beach extends along the Balboa Peninsula, south of Newport Pier to the Newport Harbor entrance. The Balboa Pier Plaza and beach here are similar to that of Newport Pier; there are numerous shops, a bathroom and shower facility, a boardwalk, a playground and grassy area, and metered public parking lots. There is also a café at the end of the pier. Surfing is less popular at Balboa Pier than at West Newport due to a steeply sloping beach and reduced wave quality, which has also made the pier popular for fishing. The beach to the south of Balboa Pier has similar characteristics to West Newport Beach, but with a smaller crowd.

Street parking becomes scarcer as the peninsula thins, and the boardwalk ends about halfway down the beach. At the south end of the beach are a jetty and a small park offering views across the channel and into the bay. The jetty focuses waves to create the notorious Wedge surf break, attracting board and body

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[15] *Everest et al, 2013*

[16] *Everest et al, 2013*

[17] *Everest et al, 2013*

[18] *Everest et al, 2013*

surfers and boogie boarders during large swells.[19].Based on the existing sandy beach width at Balboa Beach, this is a *MEDIUM* need receiver site.

NB.4 Corona del Mar Beach

Corona del Mar Beach is situated immediately east of the Newport Bay channel and southwest of Ocean Boulevard. A paid parking lot of over 500 spots is provided at the beach as well as street parking above the beach on the bluff. There are restrooms, showers, volleyball nets, lifeguards, and a restaurant on the beach. The beach is used mostly by general beachgoers, many of them families local to the city or county, with a minority of tourists exploring the rocky point or enjoying the views from atop the bluff.

The water in the cove is deep, and the waves are usually calm. However, with a large south swell a wave forms along the jetty at the north end of the beach, attracting a steady stream of surfers.[20] It is owned by the California State Parks but maintained/managed by the City of Newport Beach via a Lease of State Lands. Based on the CRSMP[21], this is a *LOW* need receiver site.

NB.5 Little Corona del Mar Beach

Little Corona del Mar Beach (aka "Poppy's) is a small pocket beach with access via only a path from/to the top of the bluff to/from the beach. It is owned by the California State Parks but maintained/managed by the City of Newport Beach via a Lease of State Lands. Based on the CRSMP[22], this is a *LOW* need receiver site.

City of Newport Beach – Stockpile Sites

NB.S.1 Newport Beach North Star Beach Parking Lot

This potential stockpile site is a fenced dirt lot owned by the City of Newport Beach and used primarily for vehicular parking for the Newport Aquatic Center and North Star Beach. It is along the Upper Newport Bay shoreline and has a surface area of roughly 12,500 square yards (2.5 acres).

City of San Clemente – Receiver Sites

SC.1 Capistrano Shores

Capistrano Shores is a beachfront community within the City of San Clemente. The community consists of approximately 90 homes along the shoreline, which are accessed by a single entrance and a roadway along the landward side of the homes. Similar to Capistrano Bay District, the sandy beach is extremely narrow and many homes are protected by rock revetment and seawalls. This segment also includes the "Shorecliffs" area at the north end of the Capistrano Shores community. Based on the extremely narrow sandy beach and its "Critical" erosion hot spot rating[23], this is a *HIGH* need receiver site.

SC.2 San Clemente North Beach

The northern section of San Clemente's coast is, for the most part, a thin stretch of sand just west of the railroad tracks that caters to surfers. The width of the beach depends on the tide. These beaches can be reached via pedestrian paths off of Mariposa and Buena Vista streets and parking is limited to the residential streets. The exception is at the north end, where a metered parking lot of about 250 spots located just

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[19] *Everest et al, 2013*

[20] *Everest et al, 2013*

[21] *Everest et al, 2013*

[22] *Everest et al, 2013*

[23] *Moffatt & Nichol, 2023b*

across El Camino Real caters to the patrons of the Ole Hanson Beach Club, a Metrolink station, and a wide beach that has seasonal lifeguards and snack bar, and a playground and restrooms.

This beach is popular with bodyboarders and local and county families in the summertime, but in winter is popular for surfing. The north end is also where the San Clemente Pedestrian Beach Trail begins.[24] The CRSMP[25], identified this is a *MEDIUM* need receiver site. However, increased erosion over the past decade and its "Threatened" erosion hot spot rating[26], it is now a *HIGH* need receiver site.

SC.3 San Clemente Central City Beaches

At the foot of Avenida del Mar at the center of San Clemente sits the San Clemente Pier; the San Clemente City Beach stretches to the north and south. The Pier is crowded year-round with all types of beach users. There are a few hotels and numerous condominiums located nearby, so overnight tourists represent a significant source of tourism, especially in the summer. The Pier is also popular with local and county residents who surf, bodyboard, fish, or dine at the restaurants on the pier, the snack bar on the beach, or any of the establishments located across the street from the beach in the area known as the "Pier Bowl".

Parking is provided in a metered lot of around 170 parking spots, plus additional metered street parking. Additional amenities at the beach include bathroom and shower facilities, shaded picnic areas, and a playground. Just north of the pier is the San Clemente City Lifeguard Headquarters. Farther north of the Pier is Linda Lane Beach Park, located at the base of Linda Lane. This beach has similar amenities to the Pier and is just a short walk away. This beach, however, is slightly less crowded and caters more to local and county families.

Farther south from the San Clemente pier is the "T-Street" beach. T-Street Beach is a popular surfing destination located at the intersection of Esplanade and W. Paseo de Cristobal. Near the beach there are 30 metered parking spots and additional street parking further up the two streets and within the residential area. A pedestrian bridge leads over the railroad tracks to the beach where there are lifeguards, a seasonal snack bar, a restroom, and shower facilities.

T-Street is very popular with locals and county residents year-round. In the summer, surfing is prohibited from 10:00am to 6:00pm, and swimmers, bodyboarders, and sunbathers dominate the wide sandy beach. During summer mornings and evenings, and in the winter, surfing is popular at the centrally located reef break.[27] Based on the CRSMP,[28] and the "Critical" and "Threatened" erosion hot spot ratings along this shoreline[29], this is a *HIGH* need receiver site.

SC.4 Cyprus Shore/Cottons

The beach backing Cottons surf break is in the City of San Clemente, between San Clemente State Beach and the Orange County Border. It is the northernmost beach in the Trestles area, accessible via a paved path off of Christianitos Road that runs to Trestles (through San Onofre State Beach and the San Mateo Wetlands). Parking is available on the east side of the Interstate 5 in a paid lot of just over 100 spots or on the adjacent street. There are no amenities here apart from a pit toilet at the base of the path. Cottons is a well-regarded surfing destination, and the beach is primarily used by surfers.

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[24] *Everest et al, 2013.*

[25] *Everest et al, 2013.*

[26] *Moffatt & Nichol, 2023b*

[27] *Everest et al, 2013.*

[28] *Everest et al, 2013.*

[29] *Moffatt & Nichol, 2023b*

In the winter, the demographic is mostly local and southern California residents, however in the summer the beach is crowded with traveling surfers. Cottons is also the location of President Nixon's Western White House, La Casa Pacifica, which sits atop Cottons overlooking the ocean.[30] The railroad runs along the back of the beach. Based on the narrow sandy beach and its "Critical" erosion hot spot rating[31], this is a *HIGH* need receiver site.

City of San Clemente – Stockpile Sites

SC.S.1 San Clemente – Avenido Vista Hermosa and La Plata

This potential stockpile site is an empty lot at the southwest corner of Avenido Vista Hermosa and La Plata and is owned by the City of San Clemente. It has a surface area of roughly 9,100 square yards. A key advantage of this site is its proximity to main transit ways.

SC.S.2 San Clemente Water Reclamation Plant Yard

As part of a previous City of San Clemente opportunistic beach program, the USACE Regional General Permit (RGP) 66 included utilization of a stockpile site along Avenido Pico between El Camino Real and Avenida Vista Hermosa. The site is a maintenance yard within the City of San Clemente Water Reclamation Plant. The site has moderately available storage area with a surface area of roughly 3,200 square yards.

SC.S.3 San Clemente – North Beach

This site is located between El Camino Real and Calle Deshecha near Avenido Pico and is owned by the City of San Clemente. It is relatively small (1,800 square yards) but is close to sand receiving beaches, e.g. North Beach and Capistrano Shores.

City of Seal Beach – Receiver Sites

SB.1 West Seal Beach

The "West Beach" reach of Seal Beach is located northwest of the Seal Beach Pier and offers a wide beach with volleyball nets, restrooms and showers, and a small café and parking lot. Homes align the landward edge of the beach. This beach is less crowded than the one to the south of the pier. Kite surfing wind surfing, board surfing, body surfing, and boogie boarding are popular. Based on the historic and current wide sandy beach, this is a *LOW* need receiver site.

SB.2 East Seal Beach

This reach of Seal Beach is located southeast of the Seal Beach Pier and is less wide, but typically more crowded than the reach to the north. A public walkway runs along the back of the beach. Surfing, body surfing, and boogie boarding are popular. During the winter months, a sand dike is constructed to protect residences from winter storms. Based on the CRSMP[32], this is a *HIGH* need receiver site.

SB.3 Surfside Beach

Surfside is a private residential community within the City of Seal Beach, located between Anaheim Bay and Sunset Beach. This beach is primarily used by local families and a few surfers willing to make the walk from Sunset Beach to a wave that breaks near the base of the east jetty of Anaheim Bay. There are no

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[30] *Everest et al, 2013*

[31] *Moffatt & Nichol, 2023b*

[32] *Everest et al, 2013*

facilities here and beach users from outside Surfside generally must park at Sunset Beach. Based on the CRSMP[33], this is a *HIGH* need receiver site.

[33] *Everest et. al., 2013*

2.1.1 Beach Berm

For this placement scenario, fill material is placed as a layer over the existing beach as a berm to widen the sandy beach. The berm will be a level surface extending a certain distance from the back of the beach toward the ocean, then sloping gradually into the water. The elevation, width, length, and slope of the berm will vary for each sand placement opportunity, depending upon the quantity of material to be placed, its qualities and the condition of the beach at the time. Typical design criteria are as follows:

- Beach berm crest height to match the natural beach berm elevation (typically +10' to +15' NAVD88) and potential to include additional "freeboard elevation" to account for possible sea level rise (SLR) effects.
- Length and width of the berm based on dimensions of the project area and volume of sediment available for placement.
- Slope seaward of the berm with a constructed slope of 5:1 H:V, which will equilibrate relatively quickly over time to a flatter natural slope.

The typical planview layout and cross-section for a beach berm placement design are shown in Figure 2-1.

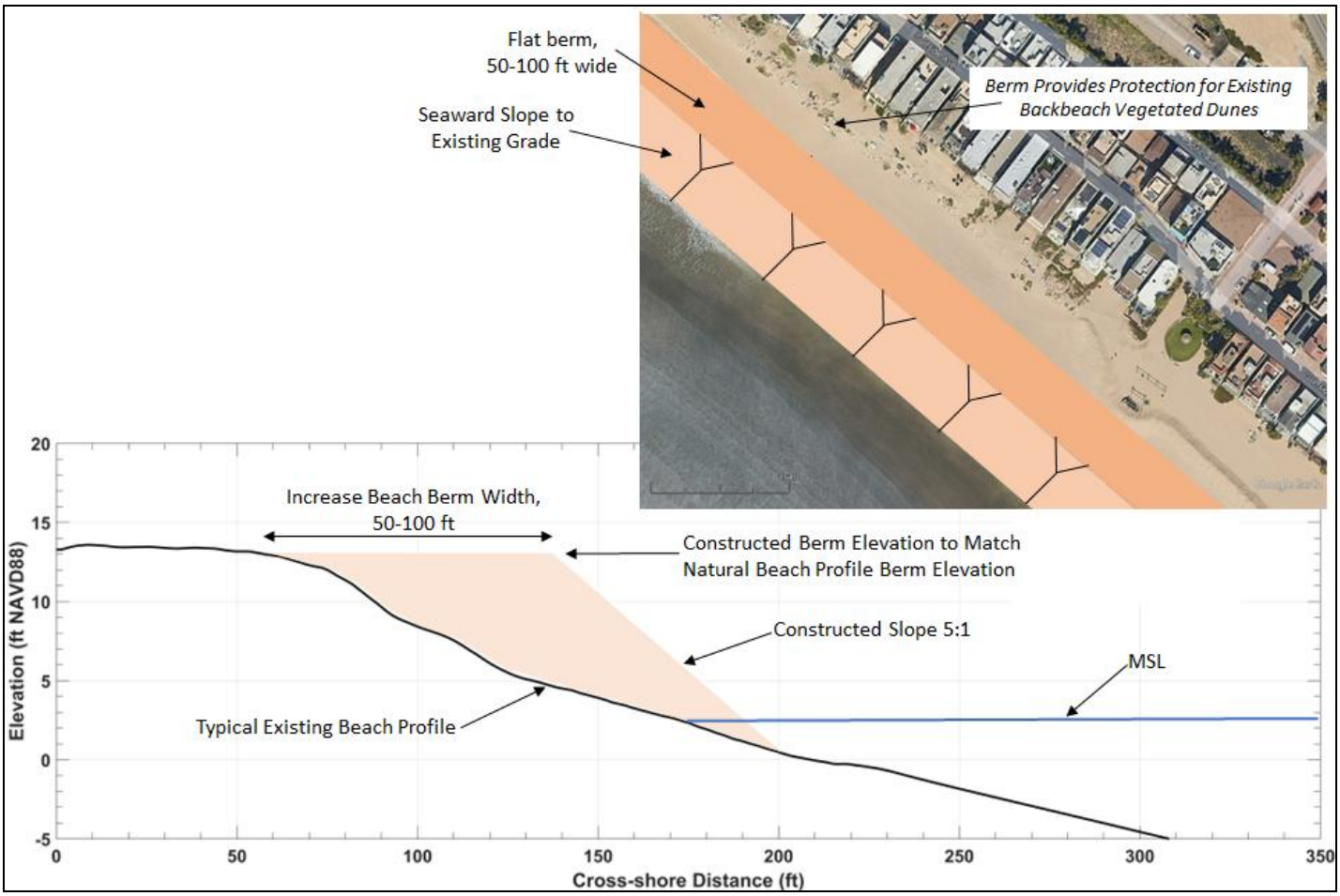

Figure 2-1 Beach Berm Design Plan View and Cross Section

2.1.2 Backbeach Storm Dike

For this placement scenario, fill material is placed in a dike-type (linear mound) structure above the dry beach berm and serves to provide wave overtopping protection for landward infrastructure. This type of feature is typically constructed during the winter months when wave action is highest and beach usage is lower and then flattened in the spring/summer months when beach usage increases. Similar to historic and ongoing dikes construction at Seal Beach East Beach, Sunset Beach, and Long Beach peninsula beach, the typical design criteria are as follows:

- Dike crest height to match the highest runup elevation (typically at least +20 ft NAVD88 for 100-year storm events);
- Dike crest width of at least 5 feet; and
- Dike sideslopes of 3:1 H:V.

It is recognized that the higher dike elevation and steeper sideslopes are more difficult for public access to the water but is considered a balance with wave overtopping protection. The typical planview layout and cross-section for a beach dike placement design are shown in Figure 2-2.

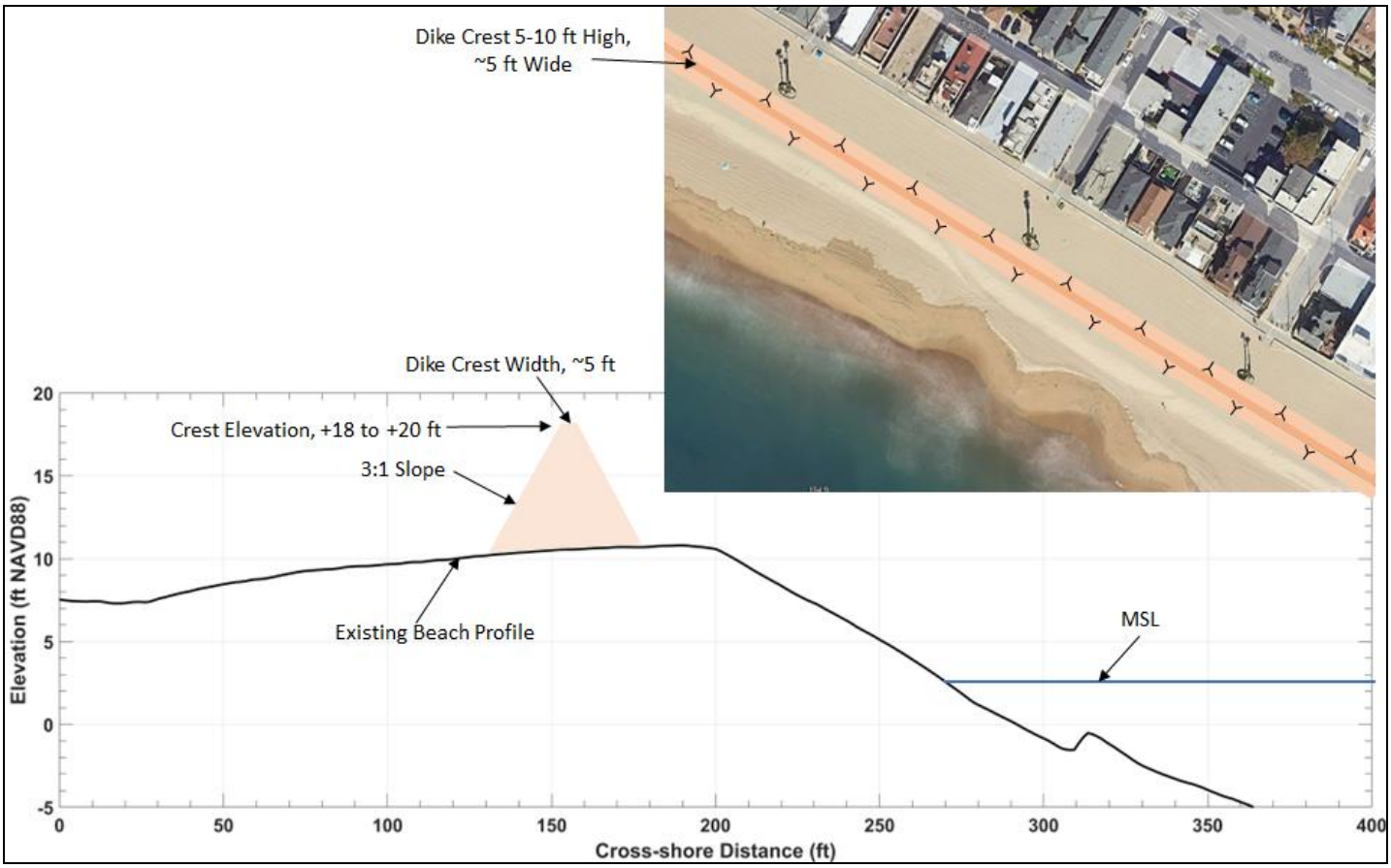

Figure 2-2 Beach Dike Design Plan View and Cross Section

2.1.3 Below Mean High Tide Line

For this placement option, fill is placed below the mean high tide line (MHTL), within the intertidal zone. This scenario is typically used if the source material is darker colored and finer grained than the native beach sand. Sand would be delivered to the beach and pushed by bulldozers to the water's edge. At low tide, the material is pushed as far seaward as possible so that it can be reworked by waves during the following rising tide. The fines would be gradually winnowed out by waves and currents, carried offshore, and sand would be left behind. This option differs from the previous berm placement approach in that, for this option, the fill is placed solely within the intertidal zone, e.g., from elevation +5 ft NAVD88 (approximate MHTL) to elevation 0 ft NAVD88, whereas for the berm option, the sand is placed much higher, e.g., at elevation +10 to +15 ft NAVD88. The typical planview layout and cross-section for a below MHTL placement design are shown in Figure 2-3.

Placement of nourishment material within the intertidal zone may cause burying of invertebrate species. In order to mitigate invertebrate population decline and encourage quick recolonization of affected areas, linear gaps can be implemented systematically along the placement footprint.

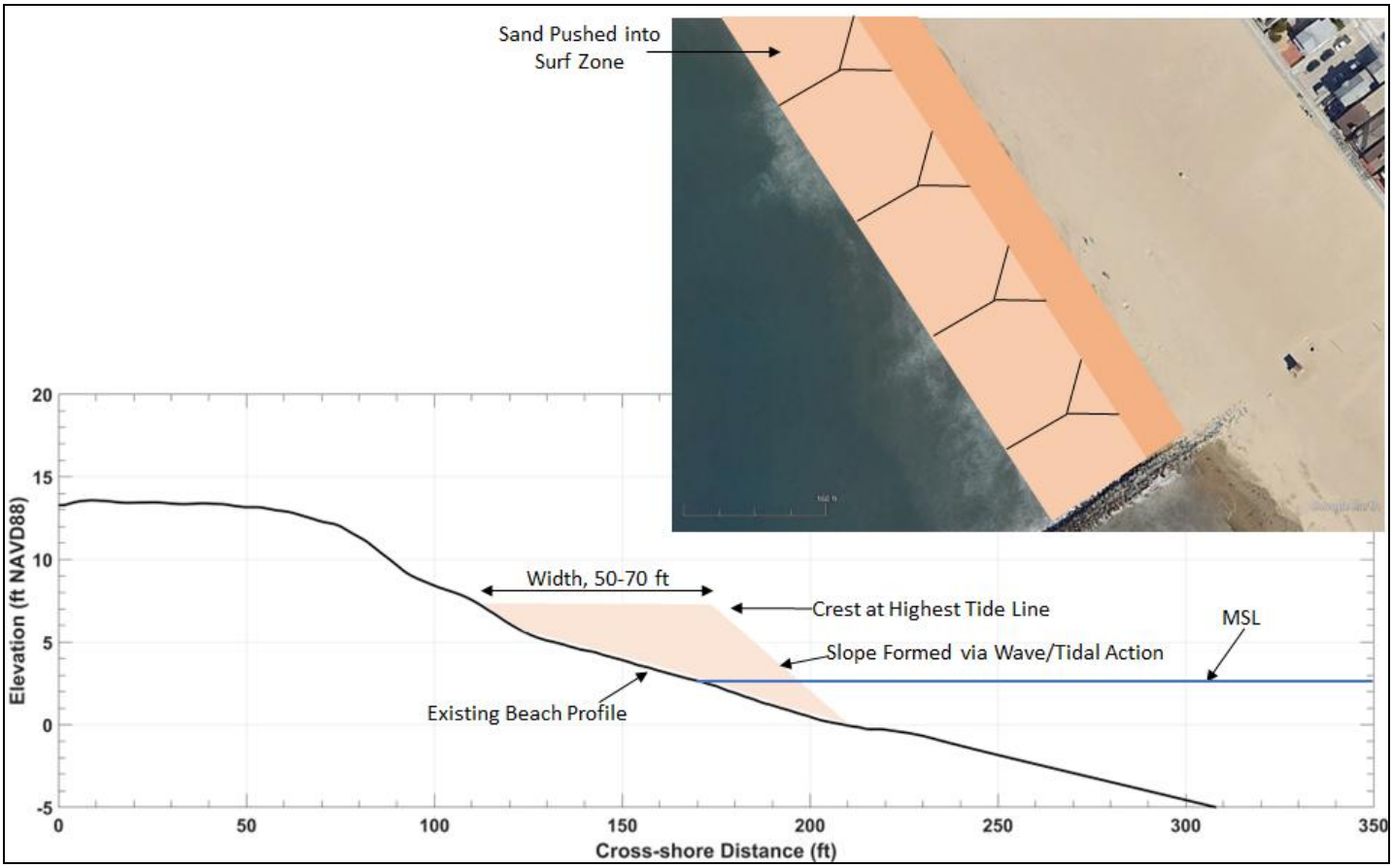

Figure 2-3 Below Mean High Tide Line Design Plan View and Cross Section

2.1.4 Backbeach Dunes

Finer-grained source sands may be suitable for placement along the backbeach for creation of vegetated dunes, for beach receiver sites with wide sandy fronting berms. These systems provide an aesthetically pleasing buffer between the beach and upland infrastructure. Additionally, the vegetated systems introduce habitat for native vegetation and animal species including foraging birds. Dunes could be created by placing and grading imported sediment onto the backbeach to form mounds and subsequently planting native vegetation species within the system. This dune placement option should be implemented in conjunction with beach berm construction if a wide sandy beach does not exist at the beach receiver site. The typical planview layout and cross-section for a backbeach dune placement design are shown in Figure 2-4.

Success of back-beach dunes has been recorded at Southern California beaches including Cardiff State Beach in Encinitas. Constructed in 2019, the Cardiff Living Shoreline is an innovative pilot project to assess the feasibility of utilizing dune systems for shoreline protection. Post-construction monitoring at Cardiff has shown that the dune system is an effective coastal resiliency measure that has performed well against multiple large storm and wave events.

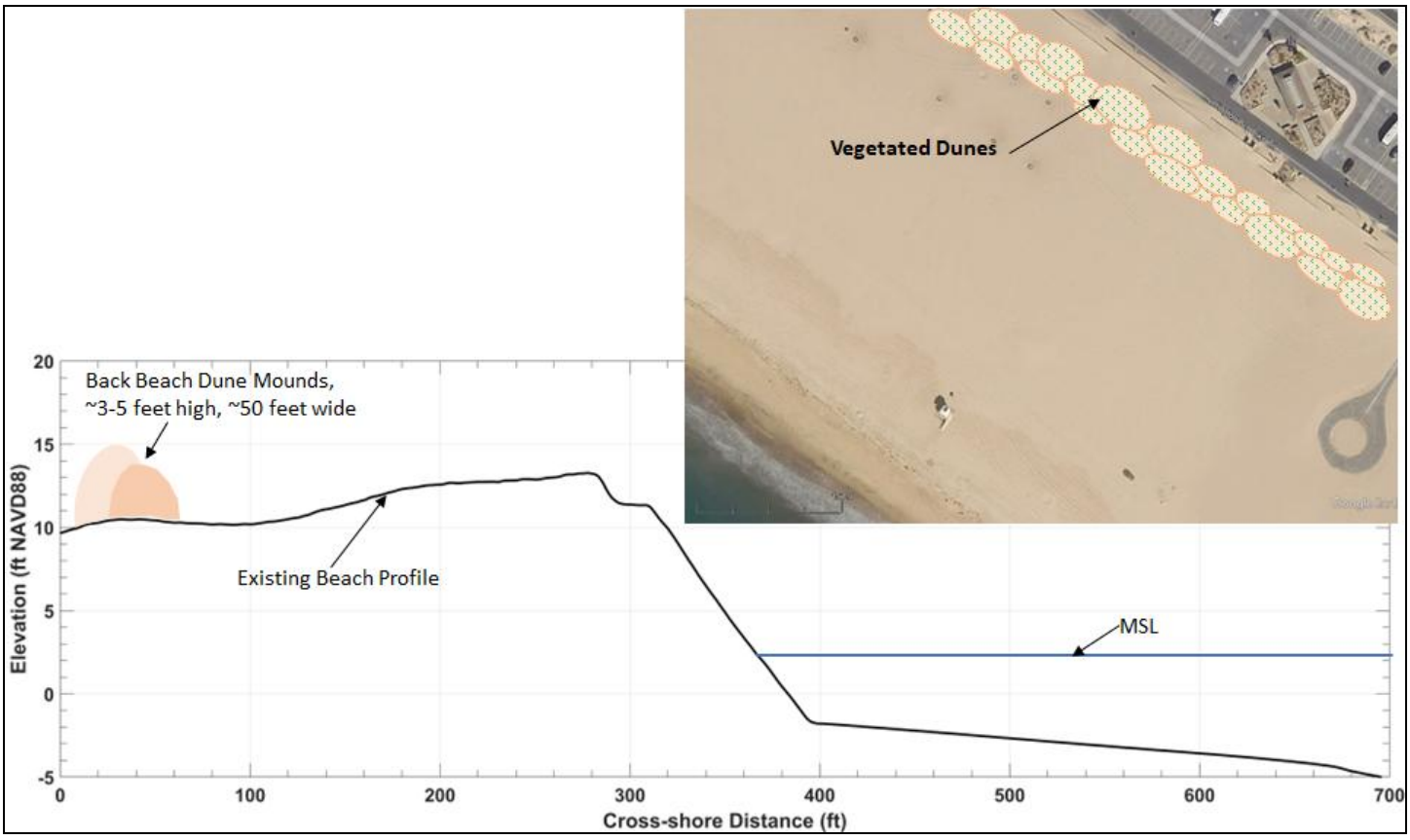

Figure 2-4 Backbeach Dunes Design Plan View and Cross Section

2.1.5 Backbeach Bluff/Cliff Stabilization

Many segments of the Orange County coastline are backed by bluffs. Increased levels of beach erosion result in less buffer between the ocean and the bluffs, which can cause increased scour at the bluff base and subsequently result in an increased risk of bluff erosion. Sediment from sand sources managed under this program may be suitable for placement along the backbeach to help combat bluff erosion by creating a stabilizing layer of sand at the base of the bluff or as sand cover on bluff toe rock or seawall protection.

The typical planview layout and cross-section for a backbeach bluff/cliff stabilization placement design are shown in Figure 2-5.

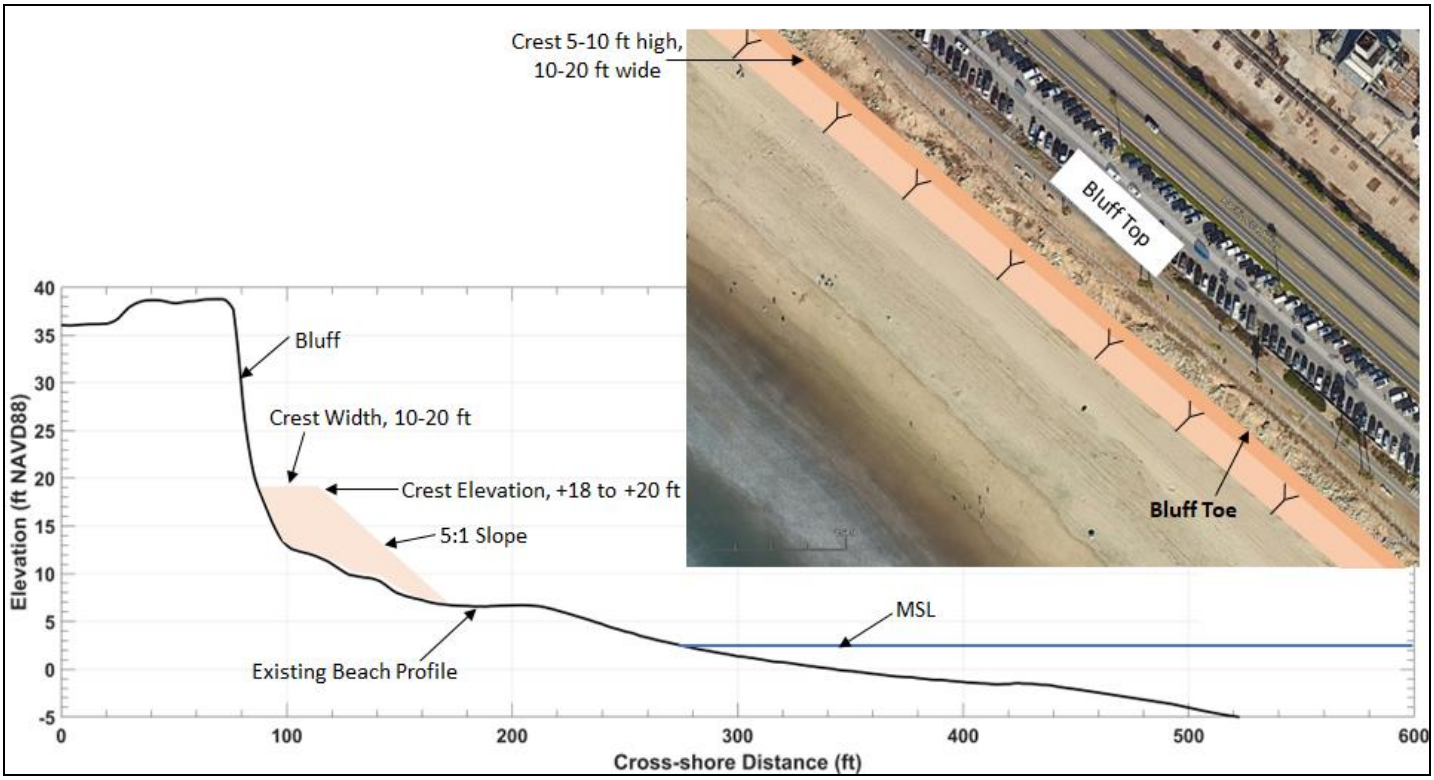

Figure 2-5 Backbeach Bluff/Cliff Stabilization Design Plan View and Cross Section

2.1.6 Placement Beyond the Surf Zone

For nearshore placement beyond the intertidal zone, placement would be via hydraulic pipeline which is placed in the water and discharges the sand farther offshore. Historically, this type of placement method has only been utilized for harbor dredging projects where the source material was located close to the receiver beach. Compared to placement within the intertidal zone, hydraulic pumping is typically a more expensive and time-consuming process because of the equipment mobilization required. Based on the type of opportunistic sources identified in this program, e.g., upland sources, and the significant costs to implement, this type of placement is not currently included as a potential placement location option, (at least for the time being).

Table 7. Receiver Sites Grain Size Limits

(Blank fields indicate that grain size data for the beach receiver site is currently not available; this table will be updated as additional grain size information becomes available.)

Receiver Site	Source Sediment Coarse Material Limit (i.e. source sediment coarse content must be equal to or less than this amount)	Source Sediment may include Cobble **?	Source Sediment Fine Material Limit for Beach Berm, Winter Dike and Backbeach Bluff Stabilization Placement (i.e. source sediment fine content must be less than this amount for these three types of beach placement designs)	Source Sediment Fine Material Limit for Below MHTL and Backbeach Dunes Placement (i.e. source sediment fine content must be less than this amount for these two types of beach placement designs)
West Beach, Seal Beach		No		
East Beach, Seal Beach	2%	No	20%	30%
Surfside Beach	0%*	No	37%	47%
Sunset Beach	0%	No	13%	23%
Huntington Harbour Beaches	7%	No	16%	N/A***
Bolsa Chica State Beach		No		
Huntington Beach Bluffs		No		
Huntington Beach State Beach		No		
West Newport Beach	1%	No	34%	44%
Balboa Beach	1%	No	8%	18%
Newport Harbor – China Cove	1%	No	32%	N/A
Newport Harbor – Marina Park		No		
Newport Dunes		No		N/A
Corona del Mar Beach		No		
Little Corona del Mar Beach		No		N/A
Crystal Cove State Park (Moro Beach only)	0%	No	0%	N/A
Salt Creek Beach		No		
Baby Beach, Dana Point Harbor	4%	No	1%	N/A
Doheny State Beach		Yes		
Capistrano Beach County Park	39%	Yes	45%	55%
Poche Beach		Yes		N/A
Capistrano Shores	34%	Yes	34%	N/A
San Clemente North Beach	34%	Yes	34%	44%
San Clemente Central Beaches	4%	No	52%	62%
San Clemente State Beach	5%	No	32%	42%
Cyprus Shore/Cottons	5%	Yes	65%	75%

**A 0% coarse limit means that the source material cannot contain any grain size greater than 4.75 mm (~0.2 inch).*

*** Cobble is defined as grain size of 64-256 mm (2.5-10 inches); for this OC SCOUP, the specific cobble size to be allowed in the source sediment is to be based on the range of natural cobble sizes at the beach receiver site.*

**** Not Applicable, meaning the beach receiver site will not have either a dune or below MHTL sand placement design.*

PRELIMINARY IMPLEMENTATION GUIDELINES

ORANGE COUNTY
SAND COMPATIBILITY AND OPPORTUNISTIC USE PROGRAM
(OC SCOUP)

Prepared for:

County of Orange
OC Public Works

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4225 E. Conant St.
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May 2026

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APPENDICES

A.1 Potential Sediment Sources

A.2 Programmatic Sediment Sampling and Analysis Plan (PSAP), including Receiver Beach Sites Grain Size Distribution Envelopes

A.3 Existing Biological Resources Maps

A.4 Project Notification Report Template

1.0 INTRODUCTION

Surplus sediment/sand is generated throughout Orange County (OC) by construction and maintenance activities. This surplus sand has the potential for beneficial use as beach nourishment. Beach nourishment has multiple benefits: protection for coastal infrastructure, enhancement of public recreation, improvement of habitat area, and stimulation of the local economy.

The OC Sand Compatibility and Opportunistic Use Program (SCOUP) is intended to establish regulatory approvals in advance to allow for beach nourishment projects to occur as these surplus sediment opportunities arise. A basic premise is that the removal/excavation of the source sediment would be separately approved by local, state, and federal agencies as appropriate, but without the OC SCOUP, the sediment would go to landfill or be utilized in construction, rather than being beneficially re-used on OC beaches.

The potential receiving sites for the opportunistic sand are beaches along the Orange County shoreline, which are owned and managed by OC coastal cities (from north to south: Seal Beach, Huntington Beach, Newport Beach, Dana Point, and San Clemente), California State Parks, and OC Parks.

These implementation guidelines provide pre-established criteria for opportunistically and beneficially utilizing sediment from various sources located within and just outside of Orange County, for beach nourishment purposes. **An overarching objective is to set up the program such that it is practical and feasible for implementation, i.e., not so onerous that beneficial sediment goes unused.** This document will be updated as regulatory permits are received to add permit conditions and/or to modify the provisions herein based on the final regulatory permits.

1.1 BACKGROUND

1.1.1 Need For Sediment Management

The following is an extract from the California Coastal Sediment Management Master Plan[1] to further explain and elaborate on the premise of this opportunistic program:

> *Portions of California's coastline are actively eroding, often leading to economic losses, reduced recreational opportunities, and habitat destruction. California's coastal beaches are a highly-valued resource, providing access to the open ocean, areas for recreation, and habitat for numerous coastal species. In addition, beaches provide a buffer or transition zone between the ocean and the land, expanding and contracting over the seasons in response to waves and sand supply. Beaches require an ongoing source of sediment to maintain their width (and therefore protection), but many of California's coastal beaches have lost width over time because of an inadequate natural supply of sediment. Human activities over the last 150 years have significantly reduced the natural supplies of sediment*

[1] This Plan was developed by the California Sediment Management Workgroup, a joint collaborative between the State of California, U.S. Army Corps of Engineers, and multiple state and regional agencies.

to the coast, as well as the transport of materials along the coast. Dams block the transport of sediment through coastal streams and rivers and reduce the peak stream flows, which in turn reduces the downstream transport of desirable beach materials. Major land development projects including roads, buildings or other impermeable surfaces, reduce the volume of sediment available for mobilization. Mining of in-stream sand and gravel for commercial purposes removes that sediment from transport to the coast. Harbors trap sediment and maintenance operations modify the transport patterns through dredging and disposal practices. Wetlands intercept sediment migrating coastwards, particularly when anthropogenic changes reduce the flow of water through those wetlands. Seawalls reduce the natural contribution of coastal bluffs and dunes directly to beach sediment. In some areas, sediment is either too abundant or is a construction by-product, such as from flood control maintenance projects, harbor expansion or maintenance projects, and coastal wetland restorations.

Most sediment supply-related problems can be associated with societal failure to recognize, communicate and implement regional (i.e., littoral cell) solutions to sediment-related projects. For instance, before RSM the approach to addressing sediment imbalances by state and federal agencies was project by project with a narrow focus on solving a very local problem. Further, state and federal agencies would implement sediment projects in order to optimize cost benefit per individual project, rather than attempting to resolve the regional imbalance that was producing either the sediment excess or deficit. This approach has also led to the unfortunate perception that coastal sediment is a waste product requiring disposal, rather than a potential beneficial resource.

Programs such as this OC SCOUP address this sediment imbalance problem.

1.1.2 Opportunities

Opportunities for surplus sand come from the 380 miles of flood channels and 4 dams (OC Public Works: Orange County California, n.d.) managed and maintained by Orange County's Department of Public Works (OCPW). Other potential sources of sand outside of OCPW jurisdiction are included in this OC SCOUP in order to provide maximum potential for any sand source in the OC watershed.

Sediment detention basins are very effective at reducing the debris loads associated with flood flows; unfortunately, sediments that would otherwise be transported to the ocean by creeks and rivers, which would ultimately replenish the beaches, are trapped in debris basins and frequently disposed of upland. This "short-stopping" of sediment also occurs in creeks and estuaries where the grade is too small to support transport. With the exception of the ocean outlets, the sediment removed from the OCPW flood facilities is not typically re-used beneficially on ocean beaches.

While much of the removed flood facilities' sediment may not be suitable for beach nourishment, it is recognized that a significant opportunity exists for suitable material for nourishing beaches along the OC coastline. Many beaches are in a highly erosive condition due to lack of sediment inputs to the shoreline and lack of beach nourishments. Regarding the latter, historically, (~1990 and before), nourishments (artificial or human-induced sand supply) provided equal or more sand inputs to Southern California beaches than natural inputs (Flick, 1993); these historic

nourishments helped to sustain many Southern California beaches in the past but now are no longer as common.

While large, planned beach nourishment projects have been successful in combatting erosion, there are typically long gaps between each installment. Opportunistic beach fill is material which becomes available as a surplus from upland projects, such as the OCPW flood facility projects, and is therefore available at little cost on a more frequent basis, compared to the cost of material commonly used for large-scale beach nourishment projects. Additionally, material from these smaller-scale upland projects can be mobilized and placed on beaches more quickly when there is an urgent/emergency need, such as before or after a large storm event.

Opportunities may also arise as identified in the *SediMatch* database https://sedimatch.sfei.org/. *SediMatch* is a planning tool to assist entities in identifying potential matches between those needing sediment and those with sediment available.

1.1.3 Coordination for this Program

Prior to and throughout the development of this guidelines document, the County held meetings with the receiver beach agencies (cities, State Parks, OC Parks) to determine if there was interest in this program. All agencies expressed interest in having a program with pre-approved authorizations and a strong desire for cost-efficiency. State and federal regulatory agencies were also contacted regarding this program and, in general, these agencies are supportive of beneficially reusing sediment. Agencies suggested: a) pre-defining source sediment testing and placement sites, b) working with all involved agencies to align requirements, and c) thinking of ways to streamline permit renewals.

1.1.4 Economic Benefits of Beach Nourishment

In Orange County, beaches accounted for $15.8 billion of visitor spending in 2023 (Wilson and Foley, 2024). This spending includes hotel/motel, short-term vacation rental, and campground accommodations and purchased commodities such as local food, gasoline, ground transportation, and recreational/entertainment amenities. Studies show that for every $1 spent on beach nourishment annually, OC beach tourists generate about $3,000 in economic output, $1,400 in direct spending and $200 in taxes (Foley, 2024). The ASPBA *Shore & Beach* journal cites that, at the national level, beach tourists generate $100 in taxes annually to local, state, and federal governments for every dollar spent on beach nourishment by these governments (Houston, 2022).

An economic analysis of specific OC beaches was developed for the *Orange County Coastal Regional Sediment Management Plan* (CRSMP) (Everest et al, 2013). Spending and taxes were estimated based on estimated annual attendance at the beaches. The results are shown in Table 1-1. This analysis is more than ten years old (and current economic benefits are likely to be even greater), but the table provides a general comparative understanding of economics for specific beaches within Orange County.

Beaches provide a number of important economic functions besides tourism. Beaches act as buffers against storm damage to inland infrastructure. With sea level rise, the benefits of the storm damage reduction are likely to increase. Beaches also provide many ecological benefits that are more difficult to quantify in dollars.

Table 1-1. Economic and Tax Impacts of Orange County Beaches (Everest et al, 2013)

#	Beach	Annual Attendance	% Overnight Visitors	Total Annual Spending	City Sales Tax	City TOT	Total City Taxes	County Tax	State Tax
1,2	Seal Beach (East -West)	2,278,774	10 - 20	$58,018,470	$331,763	$283,369	$615,132	$331,763	$2,764,694
3,4	Surfside-Sunset Beaches	2,257,856	10 - 20	$63,631,504	n/a	n/a	n/a	$363,938	$3,032,814
7	Bolsa Chica State Beach	2,764,712	10 - 30	$81,545,257	$417,382	$458,538	$875,920	$417,382	$3,478,179
9	Huntington City Beach	9,931,425	10 - 20	$305,929,749	$1,792,242	$1,663,348	$3,455,590	$1,792,242	$14,935,346
5,6	Huntington Harbour Beaches	45,000	10 - 30	$1,428,200	$7,207	$10,435	$17,642	$7,207	$60,059
10	Huntington State Beach	2,542,332	10 - 20	$71,804,196	$370,772	$327,609	$698,380	$370,772	$3,089,763
12-14	Newport -Balboa Beaches	7,844,108	10 - 30	$234,294,894	$1,196,222	$1,463,140	$2,659,362	$1,196,222	$9,968,513
15-46	Newport Harbor Beaches	13,000	10	$344,443	$1,803	$812	$2,614	$1,803	$15,023
47,48	Corona Del Mar State, Little Corona Beaches	369,515	10	$9,790,535	$51,243	$26,817	$78,060	$51,243	$427,029
49	Crystal Cove State Park	666,820	10 - 30	$19,347,190	n/a	n/a	n/a	$109,999	$916,660
56	Laguna Beach	4,131,516	10 - 30	$123,403,841	$630,054	$770,640	$1,400,694	$630,054	$5,250,446
62	Aliso County Beach Park	3,298,056	10 - 20	$92,946,689	$480,159	$410,118	$890,277	$480,159	$4,001,325
67	Monarch Beach	220,000	10 - 20	$6,143,567	$31,798	$23,189	$54,987	$31,798	$264,982
68	Salt Creek Beach	3,967,715	10 - 30	$118,511,291	$605,074	$740,087	$1,345,161	$605,074	$5,042,284
70,71	Dana Point - Baby Beach	1,214,374	10 - 20	$34,223,823	$176,799	$151,009	$327,808	$176,799	$1,473,325
72	Doheny State	1,827,231	5 - 10	$47,044,457	$247,786	$49,017	$296,803	$247,786	$2,064,883
73	Capistrano County Beach	516,788	10 - 30	$15,805,704	$80,325	$116,844	$197,169	$80,325	$669,376
75	San Clemente City Beach	2,583,940	10 - 30	$60,438,445	$401,625	$584,220	$985,846	$401,626	$3,346,881
76	San Clemente State Beach	519,641	20 - 35	$17,037,650	$85,459	$59,890	$145,349	$85,459	$712,157
77	Cottons	330,000	10 - 30	$10,092,885	$51,292	$74,612	$125,904	$51,292	$427,437
	Total	47.3 million	n/a	$1.4 billion	$6.9 million	$7.2 million	$14.1 million	$7.4 million	$61.9 million

n/a = not applicable

1.2 PURPOSE OF OPPORTUNISTIC PROGRAM

OC SCOUP is designed to capitalize on opportunities to obtain beach-quality sand as surplus material from upland sources (opportunistic sand) as described above. The purpose of the program is to streamline the approval process for implementing beach nourishment projects.

While the sediment removal (sediment source) is already (or will be) addressed by existing authorizations, there are no/few authorizations which allow for this sediment to be placed on beaches. The proposed opportunistic use program is to obtain regulatory approvals in advance to allow for beach nourishment projects to occur as sediment source opportunities arise. This not only eliminates the need for individual permits for each project but is also meant to avoid the current situation in which the OCPW maintenance sediment (and presumably sediment managed by other government entities) is disposed in upland areas simply because timely approval for beach nourishment use was not possible. The program would also help to alleviate the staff workloads of public agencies.

This program would allow beach nourishments to occur based on a pre-determined set of criteria that each opportunistic project would have to meet. The criteria includes chemical characteristics of the source sand, grain size compatibility with the receiving site beach sand, color, debris content, placement location, and monitoring required.

Many aspects of the proposed program are novel in nature in order to provide OC and other sediment managers with a larger degree of flexibility that will ultimately allow for greater success in implementation. Previous SCOUP projects have struggled to implement projects due to the financial and logistical burdens imposed by the stringent regulatory requirements. For example, the City of San Clemente temporarily put its SCOUP program on hold, allowing permits to expire due to regulatory constraints and increasing monitoring costs. (City of San Clemente, et. al, 2021) A similar sentiment was shared in a public meeting involving local municipalities within Orange County as follows:

> *"It was generally expressed that beach nourishment projects face a challenging burden during the regulatory approval process. Having to fulfill perceived and incrementally increasing permit conditions and requirements, and the economic costs of attempting to implement somewhat small-scale projects were some of the issues that tend to discourage participation." – (Noble, 2017)*

The proposed OC program attempts to create an agreeable framework that conforms with regulatory requirements and also mitigates previous burdens in a way that may ultimately become the new standard for future SCOUP programs. Some of the major differences from conventional SCOUP programs proposed in the OCPW program include:

- A wide range and large number of potential beach receiver sites to maximize program flexibility and opportunistic use;
- Monitoring intended to be practical and actionable, e.g., identifying monitoring for the purposes of identifying any needed remediation or adaptive management actions;
- Less stringent criteria of sediment grain size; and

- A more efficient approval process that lays out requirements for individual placement sites. Projects that conform to the specified requirements would be preapproved under this program thus expediting the timeline between when sand becomes available and its actual placement on the beach.

1.3 PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide implementation guidelines for the opportunistic beneficial use of sediment located in sources within and just outside of Orange County for placement on Orange County beaches. The report provides specific criteria for material suitability based on grain size, chemical characteristics, color, and other properties. It recommends specific placement locations, rates, and timing in order to maximize the benefits of beach enhancement activities while minimizing environmental impacts. A monitoring framework is also provided that balances economic feasibility with environmental sensitivity for varying project sizes and locations.

1.4 IMPLEMENTATION PROCESS

In most cases, implementation of a SCOUP project (opportunistic event) will consist of the steps outlined below and described further herein.

1. *Notification of Opportunistic Sand:* Sand provider (source sediment site managing entity) notifies OCPW and/or beach receiver site managing entity(ies) of sand opportunity. If more than one beach receiver site managing entity is interested in the source sediment, the prioritization process identified in Section 10 is followed.
2. *Initial Evaluation:* The beach receiver site managing entity reviews available information to determine if: a) the source is likely to be suitable for beach placement, b) sufficient funding is available, c) the source sediment availability meets SCOUP timelines, and/or d) use of an inland stockpile site is needed. A site visit may be conducted, if necessary, to perform an initial evaluation of the quality and color of the source sediment. The receiver site managing entity coordinates with the sand provider to determine responsibilities, including costs.
3. *Source Sediment Sampling Plan:* The beach receiver site managing entity develops the source site sampling design (number, location, and depth of samples) and submits it to the USEPA and CCC for approval. Reference Section 4.2 and the Programmatic Sampling and Analysis Plan (PSAP; Appendix A.2) for further details. Agency approval is requested within 14 days of receipt.
4. *Source Sediment Testing:* Following approval of the sampling design, the source sediment is sampled and tested in accordance with the approved sampling design and the Programmatic Sampling and Analysis Plan (PSAP; Appendix A.2).
5. *PNR Preparation and Submittal to Regulatory Agencies:* The beach receiver site managing entity prepares the Project Notification Report (PNR; Appendix A.4). The PNR includes the PSAP results, construction plan, schedule, public notification process, roles and responsibilities and required monitoring. The beach receiver site managing entity submits the PNR to regulatory agencies in accordance with regulatory permits.

6. *PNR Approval:* Regulatory agencies approve proposed project. Agency approval is requested within 30 days of receipt.
7. *Public Notice:* The beach receiver site managing entity issues public notice of transportation and construction activities.
8. *Sand Processing:* If needed, the source sediment is processed (screened) at the source site to remove debris/vegetation/rock (if present).
9. *Transportation:* A transportation (e.g., haul route) permit is acquired as needed from local municipalities and the source sediment is transported to the beach receiver site (or stockpile site).
10. *Grading:* The source sediment is placed on the beach and graded according to the beach placement strategy specified in PNR.
11. *Monitoring:* Monitoring and reporting are performed as specified in the PNR.

As discussed further in this document, the considerations for the placement of opportunistic sand for beach nourishment are:

1. Source sand chemical constituents;
2. Grain size compatibility between the source sediment and native beach sand;
3. Presence of cobble and/or seashells in the source sediment which could detract from the comfort of beach users;
4. Color (mainly an aesthetic consideration);
5. Debris and organic/vegetation content (the beach fill must not contain litter, trash, or significant quantities of organics);
6. Compactability/moldability of beach fill (the material must not possess the tendency for hardpan formation);
7. Potential for invasive Caulerpa (marine-originated sediment only);
8. Timing of placement (to minimize impacts to human beach use, bird nesting, and grunion spawning);
9. Elevation of placement (either in-water or above-water on the beach), based on source material characteristics, existence of sensitive resources, and beach need;
10. Geometry of placement (including berm elevation, foreshore slope, shoreline advance distance, and plan configuration of the placed material);
11. Biological and physical monitoring; and
12. Environmental impact avoidance and mitigation construction (sand placement) measures at the beach receiver and stockpile sites.

Considerations 1 through 7 are addressed in Section 4.2 (*Criteria for Beach Fill Sand Sources*), Items 8-10 are discussed in Section 2 (*Sand Placement Design Considerations*) and Section 3 (Potential Sand Receiver Sites), Item 11 is discussed in Sections 6 and 7 (*Monitoring*), and Item 12 is discussed in Section 8 (*Construction BMPs*).

2.0 SAND PLACEMENT DESIGN

This section outlines basic elements for various beach placement design, methods and timing, which can be applied to beach nourishment projects at any of the receiver sites listed in Section 3.

2.1 POTENTIAL FILL PLACEMENT TEMPLATES

For each potential beach receiver site, one or more potential sand placement locations within the beach profile (cross-section design templates) are identified in Section 3. These potential placement templates are:

- on the dry beach and intertidal area as a beach berm,
- on the dry beach as a storm (winter) dike,
- below the mean high tide line,
- on the backbeach as a dune,
- on the backbeach as a cliff/bluff stabilization measure.

On the following pages, a representative beach planview and cross-section are provided for each of these potential sand placement templates. The cross-section shows an existing beach profile representative of the potential receiver site, the conceptual sand placement design, and the Mean Sea Level (MSL) water line for reference. Note that the relative scale of the horizontal and vertical axes shown in the cross-sections is not 1:1; the vertical scale is exaggerated, (so as to fit the cross-section on a single page), which makes the slopes appear much steeper than the slopes would actually be. The planview sketch shows a representative sand placement footprint relative to the back beach line and water.

2.1.1 Beach Berm

For this placement scenario, fill material is placed as a layer over the existing beach as a berm to widen the sandy beach. The berm will be a level surface extending a certain distance from the back of the beach toward the ocean, then sloping gradually into the water. The elevation, width, length, and slope of the berm will vary for each sand placement opportunity, depending upon the quantity of material to be placed, its qualities and the condition of the beach at the time. Typical design criteria are as follows:

- Beach berm crest height to match the natural beach berm elevation (typically +10' to +15' NAVD88) and potential to include additional "freeboard elevation" to account for possible sea level rise (SLR) effects.
- Length and width of the berm based on dimensions of the project area and volume of sediment available for placement.
- Slope seaward of the berm with a constructed slope of 5:1 H:V, which will equilibrate relatively quickly over time to a flatter natural slope.

The typical planview layout and cross-section for a beach berm placement design are shown in Figure 2-1.

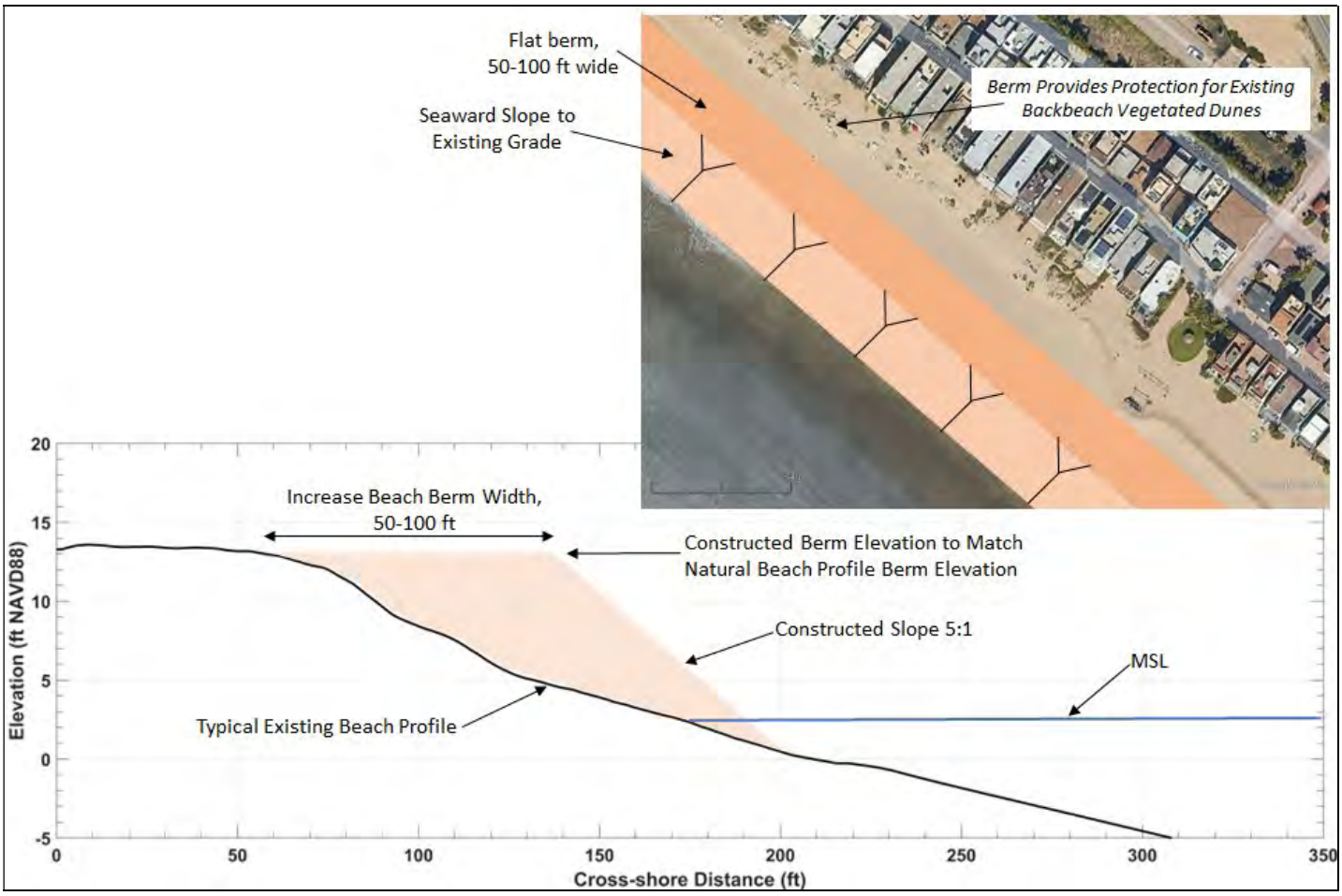

Figure 2-1 Beach Berm Design Plan View and Cross Section

2.1.2 Backbeach Storm Dike

For this placement scenario, fill material is placed in a dike-type (linear mound) structure above the dry beach berm and serves to provide wave overtopping protection for landward infrastructure. This type of feature is typically constructed during the winter months when wave action is highest and beach usage is lower and then flattened in the spring/summer months when beach usage increases. Similar to historic and ongoing dikes construction at Seal Beach East Beach, Sunset Beach, and Long Beach peninsula beach, the typical design criteria are as follows:

- Dike crest height to match the highest runup elevation (typically at least +20 ft NAVD88 for 100-year storm events);
- Dike crest width of at least 5 feet; and
- Dike sideslopes of 3:1 H:V.

It is recognized that the higher dike elevation and steeper sideslopes are more difficult for public access to the water but is considered a balance with wave overtopping protection. The typical planview layout and cross-section for a beach dike placement design are shown in Figure 2-2.

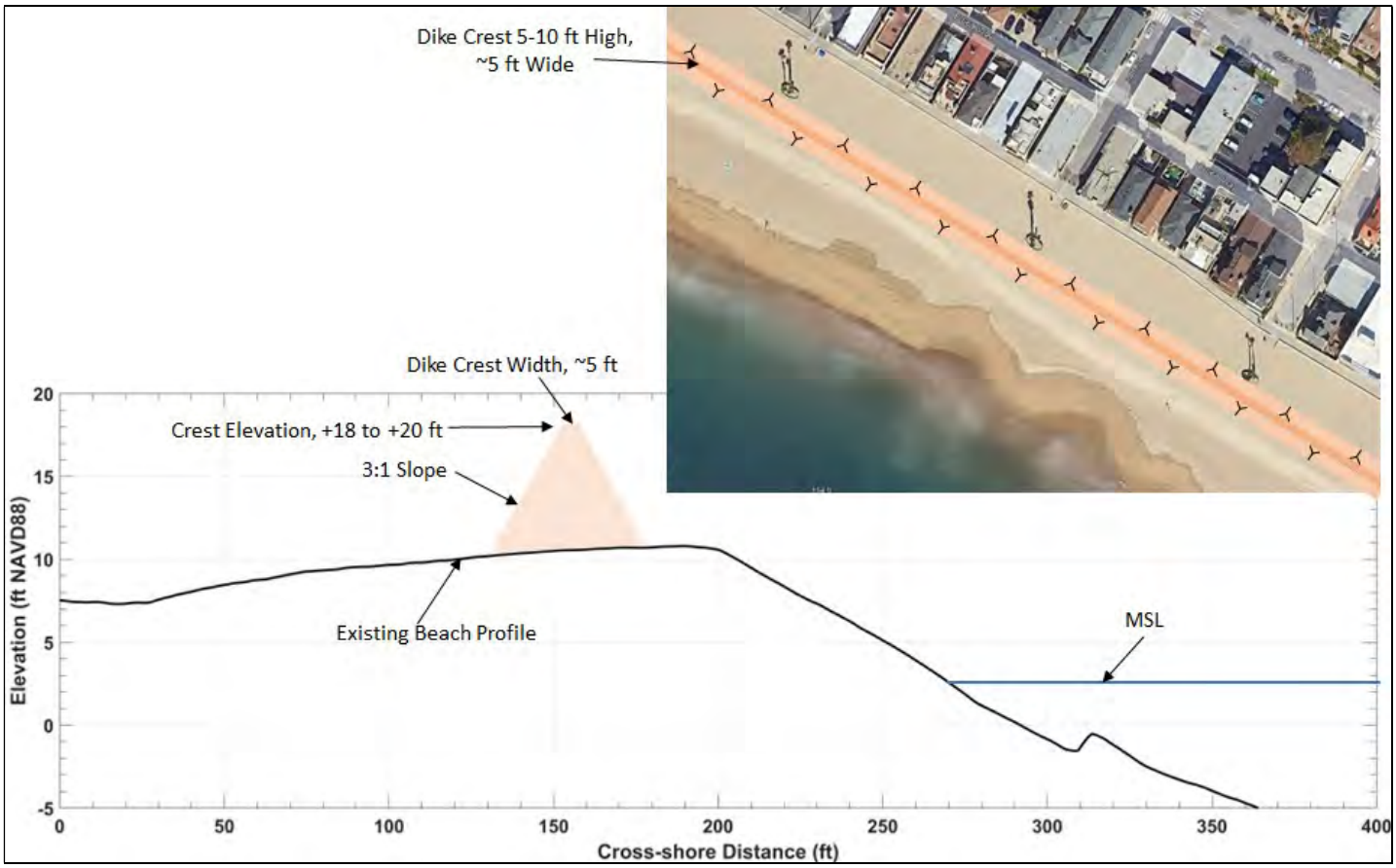

Figure 2-2 Beach Dike Design Plan View and Cross Section

2.1.3 Below Mean High Tide Line

For this placement option, fill is placed below the mean high tide line (MHTL), within the intertidal zone. This scenario is typically used if the source material is darker colored and finer grained than the native beach sand. Sand would be delivered to the beach and pushed by bulldozers to the water's edge. At low tide, the material is pushed as far seaward as possible so that it can be reworked by waves during the following rising tide. The fines would be gradually winnowed out by waves and currents, carried offshore, and sand would be left behind. This option differs from the previous berm placement approach in that, for this option, the fill is placed solely within the intertidal zone, e.g., from elevation +5 ft NAVD88 (approximate MHTL) to elevation 0 ft NAVD88, whereas for the berm option, the sand is placed much higher, e.g., at elevation +10 to +15 ft NAVD88. The typical planview layout and cross-section for a below MHTL placement design are shown in Figure 2-3.

Placement of nourishment material within the intertidal zone may cause burying of invertebrate species. In order to mitigate invertebrate population decline and encourage quick recolonization of affected areas, linear gaps can be implemented systematically along the placement footprint.

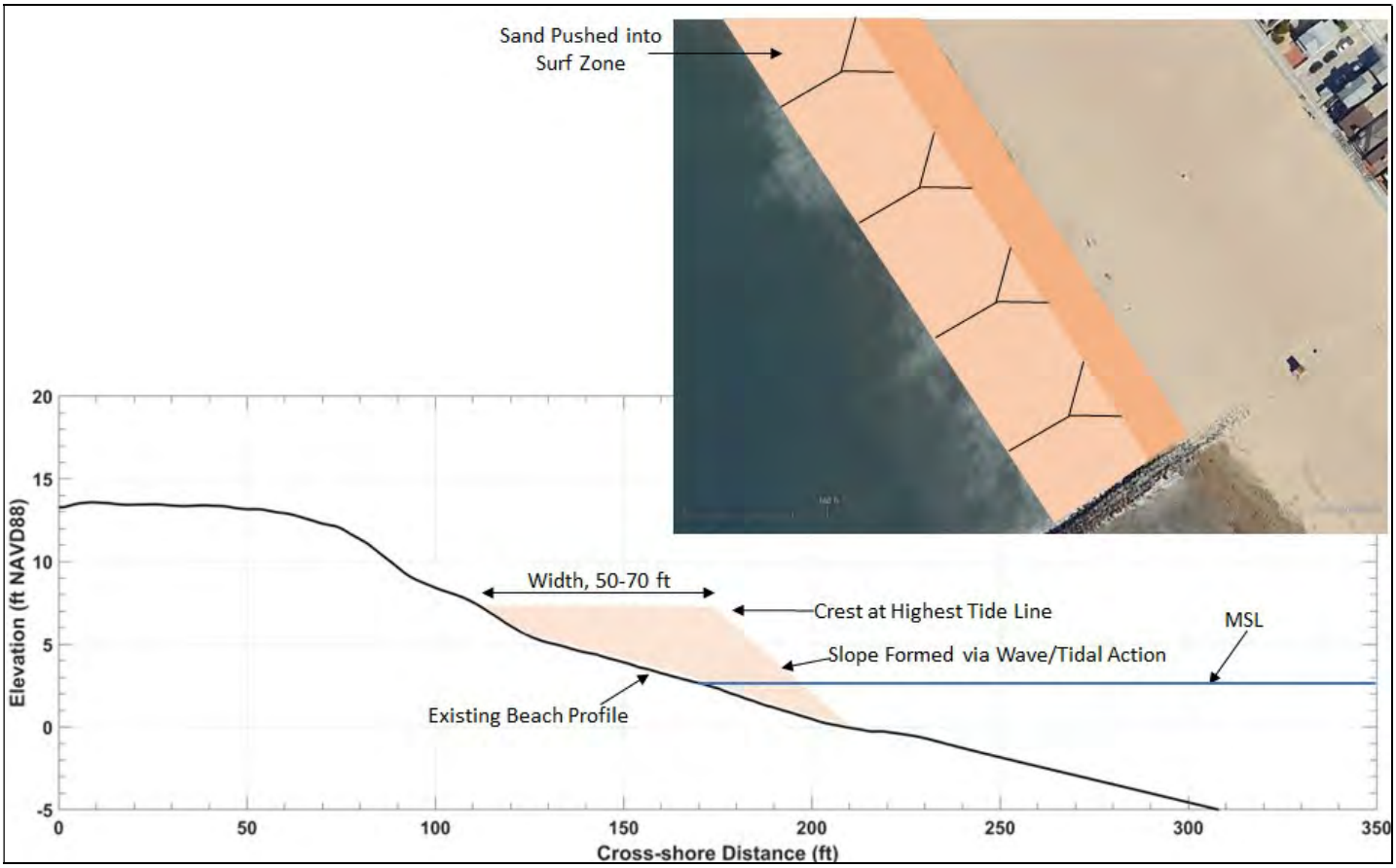

Figure 2-3 Below Mean High Tide Line Design Plan View and Cross Section

2.1.4 Backbeach Dunes

Finer-grained source sands may be suitable for placement along the backbeach for creation of vegetated dunes, for beach receiver sites with wide sandy fronting berms. These systems provide an aesthetically pleasing buffer between the beach and upland infrastructure. Additionally, the vegetated systems introduce habitat for native vegetation and animal species including foraging birds. Dunes could be created by placing and grading imported sediment onto the backbeach to form mounds and subsequently planting native vegetation species within the system. This dune placement option should be implemented in conjunction with beach berm construction if a wide sandy beach does not exist at the beach receiver site. The typical planview layout and cross-section for a backbeach dune placement design are shown in Figure 2-4.

Success of back-beach dunes has been recorded at Southern California beaches including Cardiff State Beach in Encinitas. Constructed in 2019, the Cardiff Living Shoreline is an innovative pilot project to assess the feasibility of utilizing dune systems for shoreline protection. Post-construction monitoring at Cardiff has shown that the dune system is an effective coastal resiliency measure that has performed well against multiple large storm and wave events.

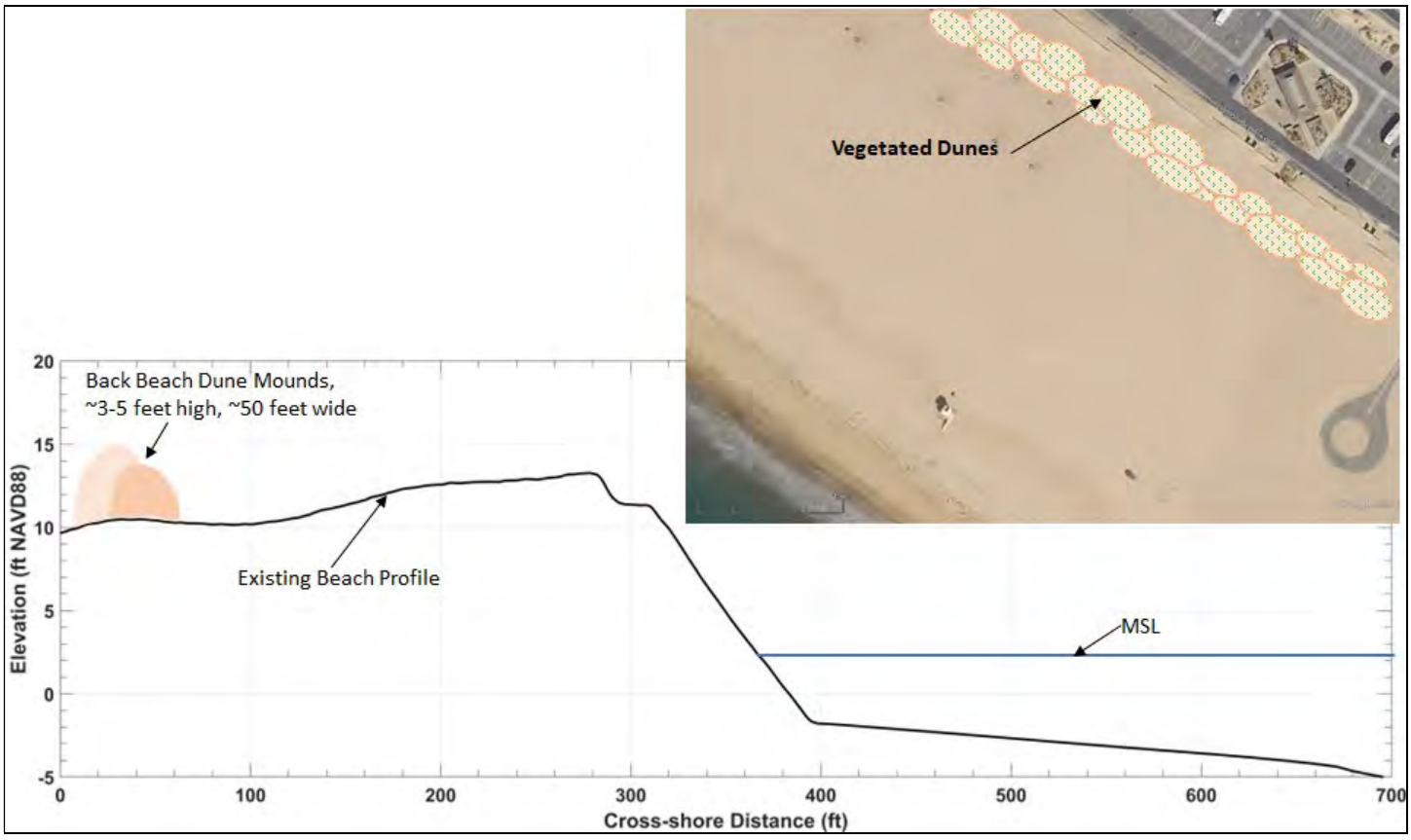

Figure 2-4 Backbeach Dunes Design Plan View and Cross Section

2.1.5 Backbeach Bluff/Cliff Stabilization

Many segments of the Orange County coastline are backed by bluffs. Increased levels of beach erosion result in less buffer between the ocean and the bluffs, which can cause increased scour at the bluff base and subsequently result in an increased risk of bluff erosion. Sediment from sand sources managed under this program may be suitable for placement along the backbeach to help combat bluff erosion by creating a stabilizing layer of sand at the base of the bluff or as sand cover on bluff toe rock or seawall protection.

The typical planview layout and cross-section for a backbeach bluff/cliff stabilization placement design are shown in Figure 2-5.

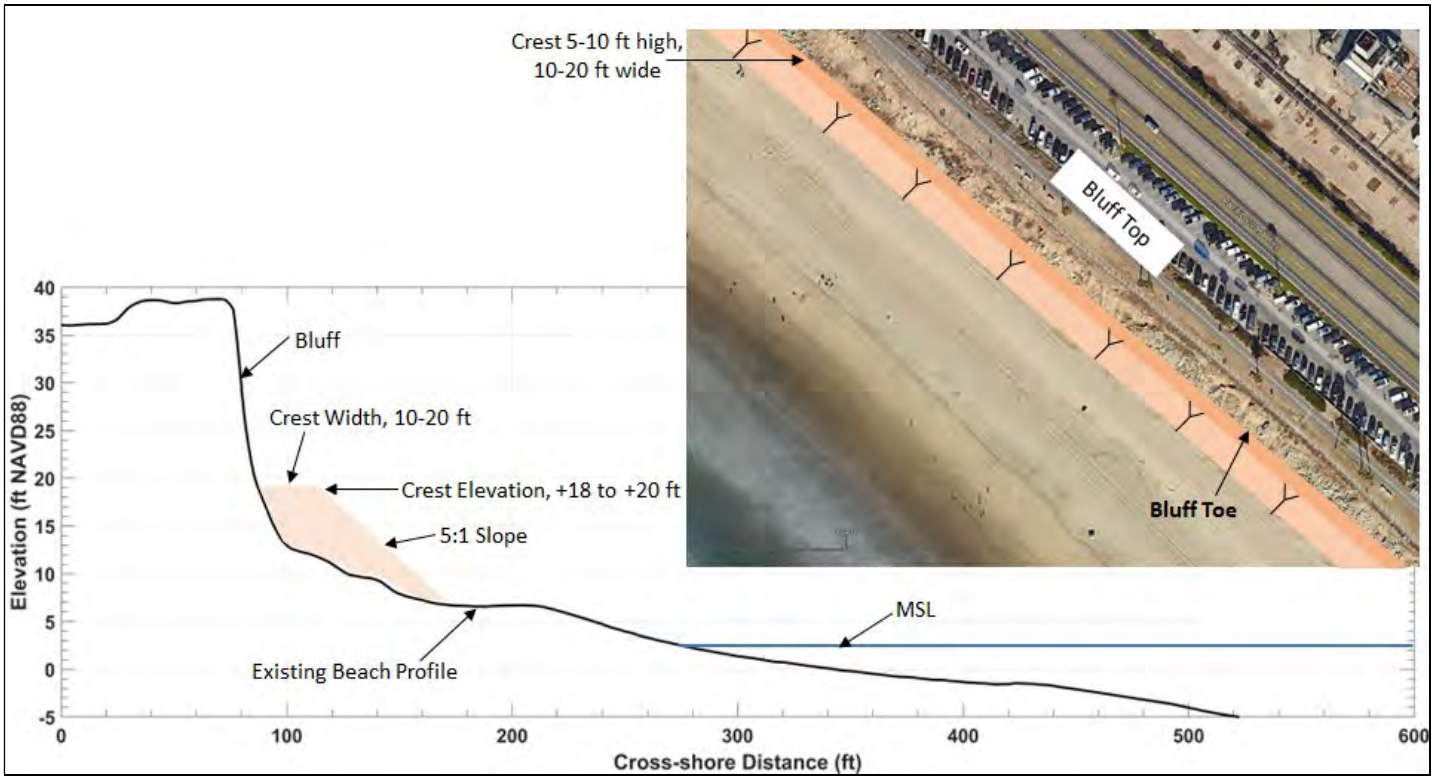

Figure 2-5 Backbeach Bluff/Cliff Stabilization Design Plan View and Cross Section

2.1.6 Placement Beyond the Surf Zone

For nearshore placement beyond the intertidal zone, placement would be via hydraulic pipeline which is placed in the water and discharges the sand farther offshore. Historically, this type of placement method has only been utilized for harbor dredging projects where the source material was located close to the receiver beach. Compared to placement within the intertidal zone, hydraulic pumping is typically a more expensive and time-consuming process because of the equipment mobilization required. Based on the type of opportunistic sources identified in this program, e.g., upland sources, and the significant costs to implement, this type of placement is not currently included as a potential placement location option, (at least for the time being).

2.2 PLACEMENT TIMING

Seasonal constraints for sand placement activities include grunion runs and least tern or snowy plover nesting and public high-use times. The typical "no-placement" time window occurs during the Spring and Summer months and presents a significant constraint for opportunistic sediment. However, source sand opportunities are likely to arise year-round. Many times, source sediment availability overlaps the spring/summertime period when beach nourishment is least ideal, especially given that most flood facility maintenance cannot occur during the rainy season. When/if sediment sources become available during Spring and Summer months, the following can be implemented to minimize impacts:

- Stockpile source sand at an offsite location until beach placement timing is suitable;
- Avoid placement on receiving site beach during weekends;
- Avoid placement at especially popular beaches; and
- Perform sensitive bird species and grunion monitoring as defined in Section 6.

Further, timing of construction (sand placement) activities is subject to ordinances of the local municipality. Table 2-1 shows the approved days and times for construction activities for the various municipalities in which the OC SCOUP beach receiver sites are located.

Table 2-1. Approved Construction Days and Times, by Jurisdiction

Jurisdiction	Days and Times Approved for Construction
Orange County	Monday – Saturday: 7:00 a.m. – 8:00 p.m.
City of Costa Mesa	Monday – Friday: 7:00 a.m. – 7:00 p.m. Saturday: 9:00 a.m. – 6:00 p.m.
City of Dana Point	Monday – Friday: 7:00 a.m. – 8:00 p.m.
City of Huntington Beach	Monday – Saturday: 7:00 a.m. – 8:00 p.m.
City of Irvine	Monday – Friday: 7:00 a.m. – 7:00 p.m. Saturday: 9:00 a.m. – 6:00 p.m.
City of Newport Beach	Monday – Friday: 7:00 a.m. – 6:30 p.m. Saturday: 8:00 a.m. – 6:00 p.m.
City of San Clemente	Monday – Friday: 7:00 a.m. – 6:00 p.m. Saturday: 8:00 a.m. – 6:00 p.m.
City of Seal Beach	Monday – Friday: 7:00 a.m. – 8:00 p.m. Saturday: 8:00 a.m. – 8:00 p.m.

2.3 PLACEMENT RATE

The sand placement rate will be limited by the maximum number of trucks which can deliver sand to the beach receiver site within a certain time period. This rate varies from 8 to 16 trucks per hour or approximately 112 to 224 cubic yards (cy) per hour, based on a 14-cy truck capacity.

2.4 MARINE PROTECTED AREA CONSTRAINTS

Several State Marine Protected Areas (MPAs) occur along the Orange County coastline (**Figure 2-6**). MPAs are management designations that provide additional regulatory protection of biological resources. Three different classifications of MPAs exist with varying levels of protection: a) State Marine Reserve (SMR), b) State Marine Conservation Area (SMCA), and c) No-Take State Marine Conservation Area (SMCA No Take). Table 2-2 defines and summarizes the differences between the different MPA classifications and is ordered from most (top) to least (bottom) restrictive. It should be noted though that specific regulations vary between each MPA, including regulations related to sediment placement and management activities. (California Department of Fish and Wildlife, 2016)

Table 2-2. Types of Marine Protected Areas (California MPAs, n.d.)

Type	Description
State Marine Reserve (SMR)	An MPA designation that prohibits damage or take of all marine resources (living, geologic, or cultural) including recreational and commercial take
State Marine Conservation Area (SMCA)	An MPA designation that may allow some recreational and/or commercial take of marine resources (restrictions vary)
State Marine Conservation Area (No-Take)	An MPA designation that generally prohibits the take of living, geological, and cultural marine resources, but allows potentially affected and ongoing permitted activities such as dredging and maintenance to continue

Table 2-3 lists each individual MPA within Orange County, along with its respective allowable sediment management activities per Title 14 § 632 of the California Code of Regulations.

Of Orange County's MPAs, only Upper Newport Bay SMCA, Crystal Cove SMCA and Dana Point SMCA are located along shorelines where OC SCOUP beach nourishment activities are proposed to occur and thus only these three MPAs are discussed in further detail. No potential receiver sites within the City of Laguna Beach are identified as part of this SCOUP because of the assumed challenges associated with placing sand along the Laguna Beach SMR.

The landward limits of these three MPAs is the Mean High Tide Line. Since OC SCOUP sand placement may extend seaward of the MHTL, compliance with the MPA regulations is required as further discussed in the following sections.

Title 14 § 632 of the California Code of Regulations (CCR) lists specific activities allowed and restricted for each MPA. The regulations for the three MPAs associated with OC SCOUP beach receiver sites are discussed below.

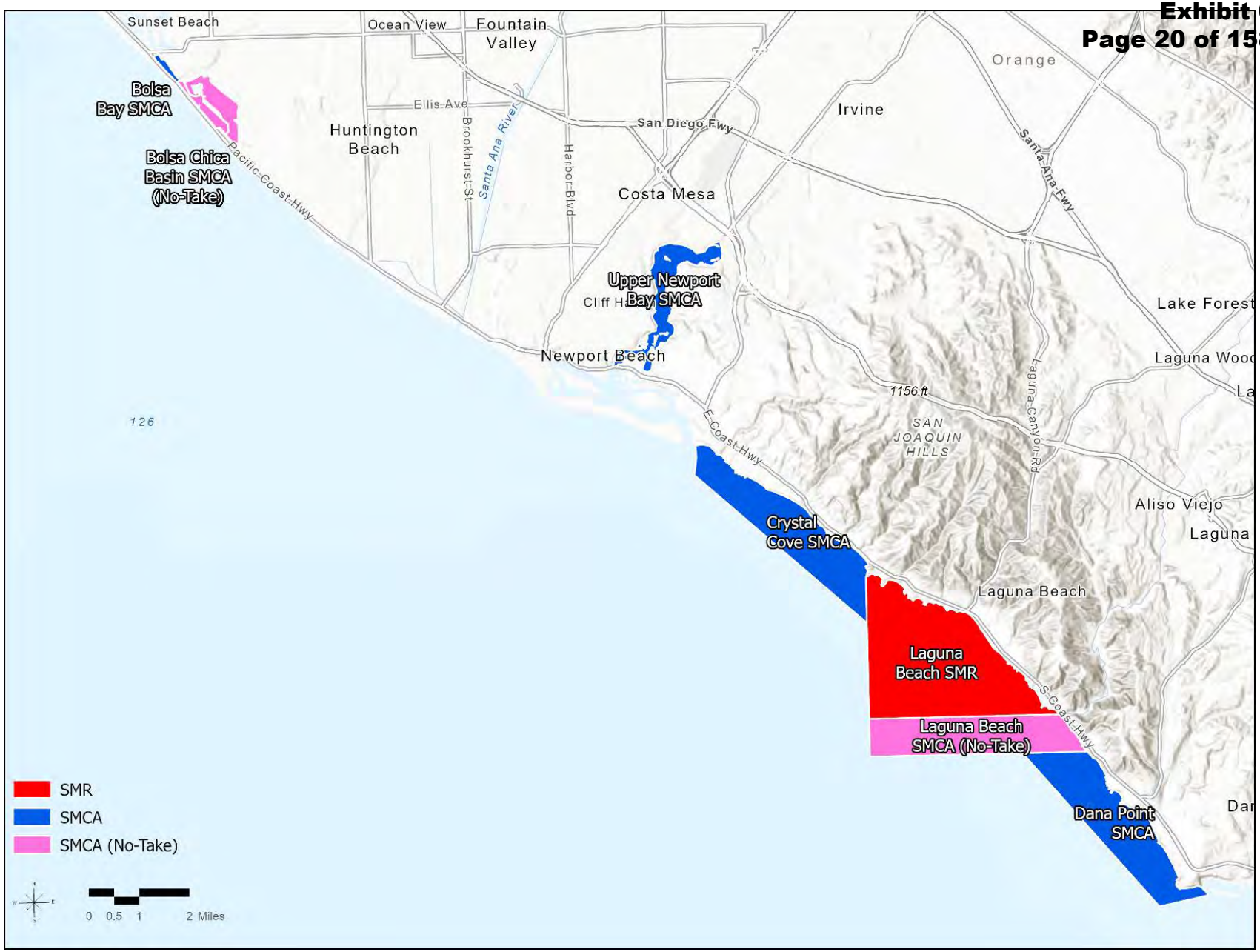

Figure 2-6 Marine Protected Areas Located in Orange County

Table 2-3. Marine Protected Areas in Orange County – Allowed Sediment Management Activities

MPA	Location	Allowable Sediment Management
Bolsa Bay SMCA	Bolsa Bay Estuary, Huntington Beach	Routine operation and maintenance, habitat restoration, maintenance dredging, research and education, and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or activities pursuant to Section 630, or as otherwise authorized by the department.
Bolsa Chica Basin SMCA (No Take)	Bolsa Chica Ecological Reserve, Huntington Beach	Routine operation and maintenance, habitat restoration, maintenance dredging, research and education, and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or activities pursuant to Section 630, or as otherwise authorized by the department.
Upper Newport Bay	Upper Newport Bay	Maintenance dredging, habitat restoration, research and education programs, maintenance of artificial structures, and operation and maintenance of existing facilities inside the conservation area is allowed pursuant to any required federal, state and local permits, or activities pursuant to Section 630, or as otherwise authorized by the department.
Crystal Cove SMCA	Crystal Cove State Park	Beach nourishment and other sediment management activities, and operation and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or as otherwise authorized by the department.
Laguna Beach SMR	Laguna Beach	No take allowed
Laguna Beach SMCA (No Take)	Laguna Beach	Operation and maintenance of artificial structures and facilities, beach grooming, maintenance dredging, and habitat restoration inside the conservation area is allowed pursuant to any required federal, state and local permits, or as otherwise authorized by the department.
Dana Point SMCA	Dana Point	Operation and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or as otherwise authorized by the department.
Legend:		
	Legal language exists conditionally allowing beach nourishment	
	Beach nourishment may be allowable, but requires confirmation from CDFW	
	Beach nourishment is most likely unallowable unless under very strict guidelines	

2.4.1 Upper Newport Bay SMCA

The beach area below (seaward of) the MHTL at Newport Dunes is within the Upper Newport Bay SMCA. The CCR for the Upper Newport Bay SMCA read as follows: "*Maintenance dredging, habitat restoration, research and education programs, maintenance of artificial structures, and operation and maintenance of existing facilities inside the conservation area is allowed pursuant to any required federal, state and local permits, or activities pursuant to Section 630, or as otherwise authorized by the department.*"

Title 14, D. 1, Refs & Annos states that *"Except for rules or regulations adopted pursuant to provisions of Sections 200 to 221, inclusive, of the Fish and Game Code, the commission may suspend or modify these rules, in whole or in part, upon good cause shown or when in the discretion of the commission the particular facts or circumstances render such action appropriate in a given instance.*"

Although dredging is allowed and beach nourishment is not specifically excluded in the CCR, approval from the California Fish and Game Commission may be required for sand placement on the Newport Dunes beach seaward of the MHTL. (As of this writing, awaiting feedback from CDFW staff on this). Otherwise, sand placement at Newport Dunes may be limited to landward of the MHTL.

2.4.2 Crystal Cove SMCA

The beach areas below the MHTL at Corona del Mar, Little Corona del Mar, and Crystal Cove are within the Crystal Cove SMCA. The CCR for the Crystal Cove SMCA read as follows: "*Beach nourishment and other sediment management activities, and operation and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or as otherwise authorized by the department.*"

Therefore, OC SCOUP sand placement is allowable for Corona del Mar beach, Little Corona del Mar beach, and Crystal Cove State Beach, both seaward and landward of the MHTL and granted that the activity is permitted by agencies responsible for regulating this activity.

2.4.3 Dana Point SMCA

The beach area below the MHTL at Salt Creek Beach is within the Dana Point SMCA. The CCR exceptions at Dana Point SMCA read as follows: "*Operation and maintenance of artificial structures inside the conservation area is allowed pursuant to any required federal, state and local permits, or as otherwise authorized by the department."*

Although beach nourishment is not specifically excluded in the CCR, approval from the California Fish and Game Commission may be required for sand placement on Salt Creek Beach seaward of the MHTL. (As of this writing, awaiting feedback from CDFW staff on this). Otherwise, sand placement at Salt Creek Beach may be limited to landward of the MHTL. It should be noted that beach nourishment projects have been permitted previously along Doheny and Capistrano beaches, which are located downcoast of (but not within) the Dana Point SMCA.

3.0 POTENTIAL SAND RECEIVER SITES

In an effort to provide maximum flexibility for material from a broad range of sediment sources and to allow for maximum potential opportunistic beach nourishment, the majority of the Orange County coastline is included herein for opportunistic beach nourishment. In order to allow for this generalized approach, a rigorous framework of site assessments and monitoring criteria has been created and is discussed in further detail in this section and sections 4 and 6.

Potential beach receiver sites for opportunistic sand are shown in Figure 3-1 (color-coded by need for sand) and Figure 3-2 and Figure 3-3 (color-coded by beach managing entity). Each beach receiver site is discussed in detail in the following sections 3.1 through 3.24, ordered geographically from north to south. These receiver sites have been identified based on OCPW discussions with staff from beach managing entities: City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of Dana Point, City of Laguna Beach, City of San Clemente, OC Parks, and California State Parks. All beaches within the City of Laguna Beach have been eliminated from further consideration because of existing sensitive resources, MPAs along the Laguna Beach shoreline, and difficult access for placing sand.

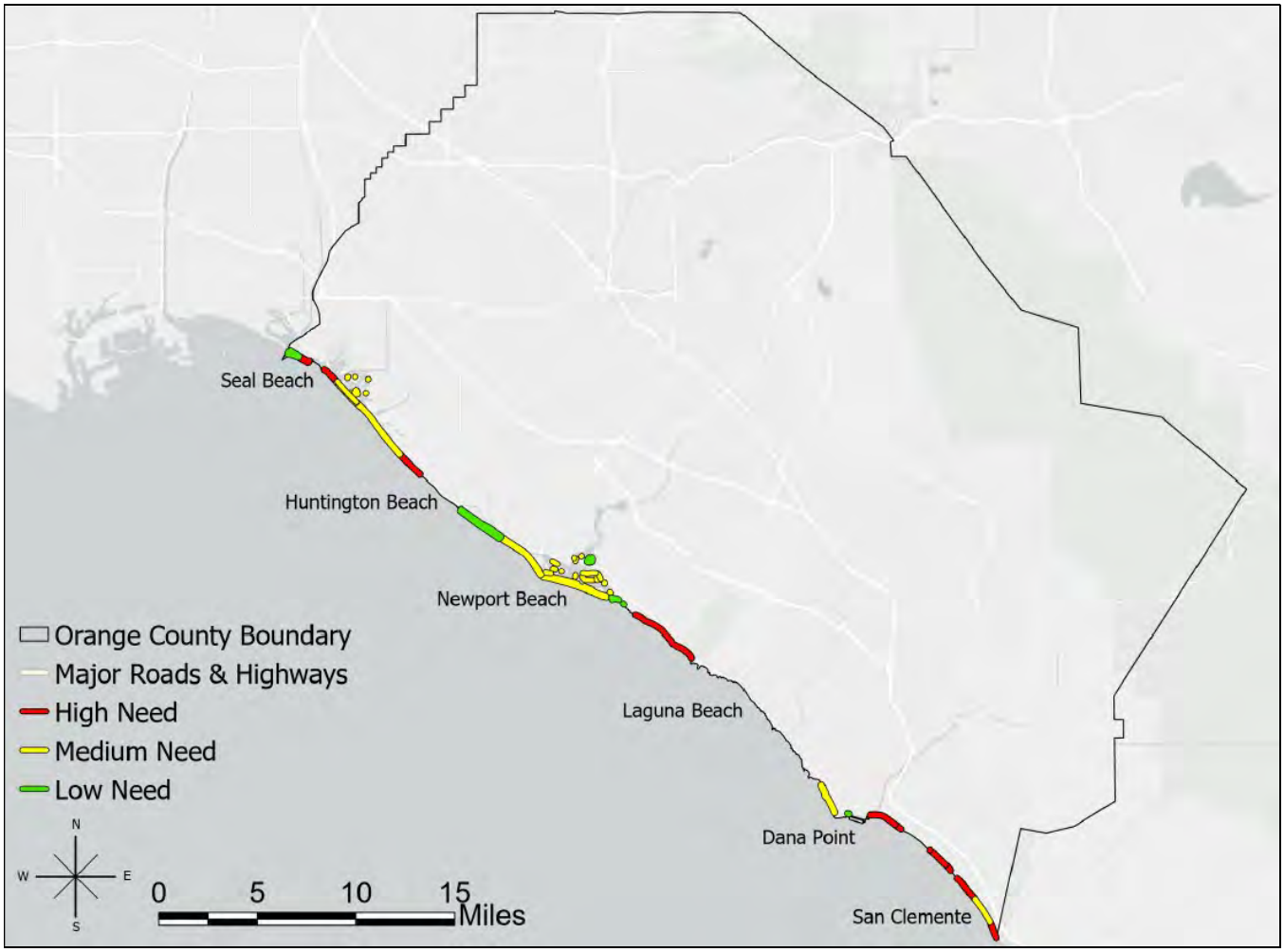

Figure 3-1. Receiver Site Locations (Showing Need for Sand)

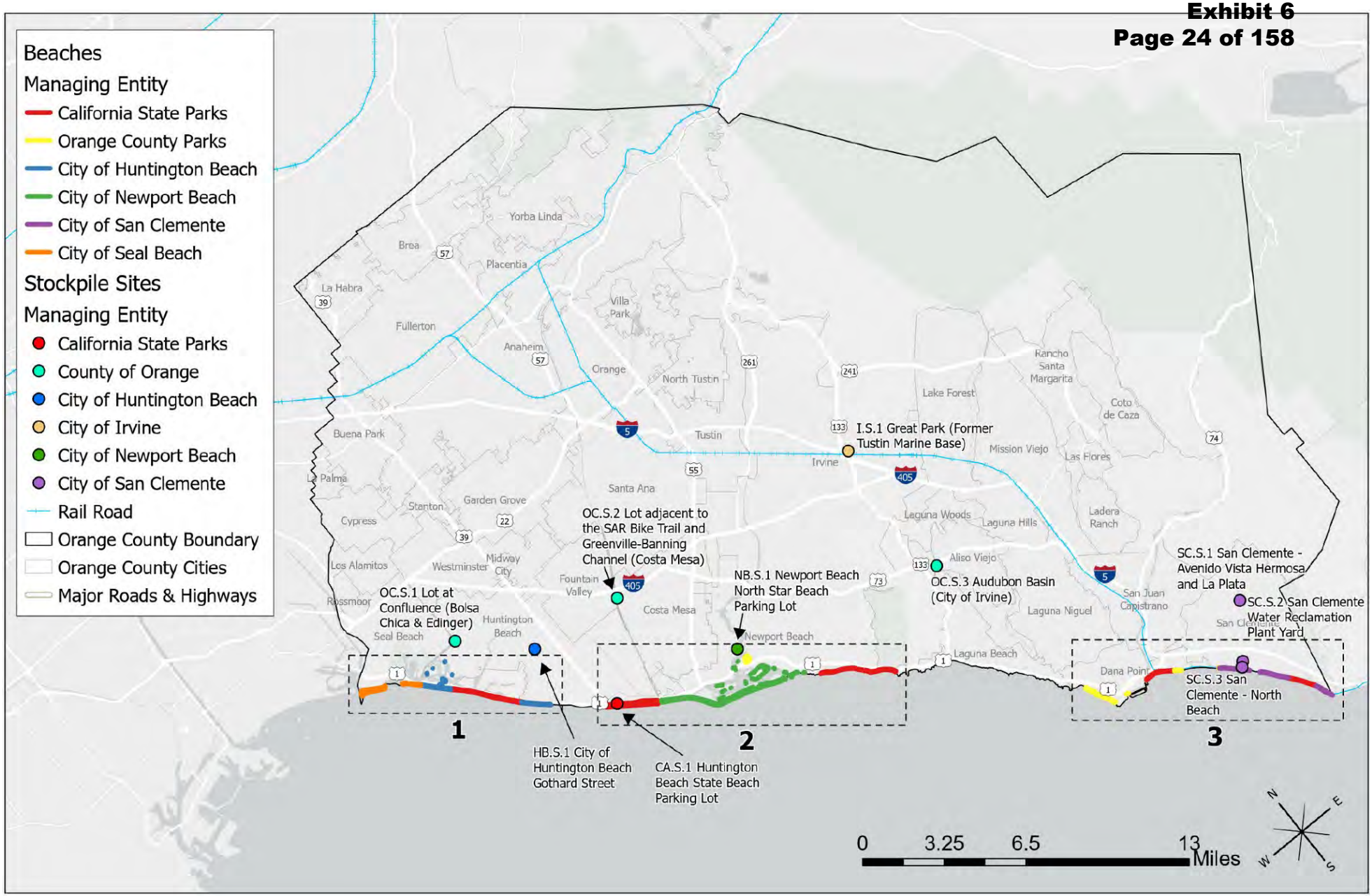

Figure 3-2. Receiver Site Locations (Showing Beach Managing Entity)

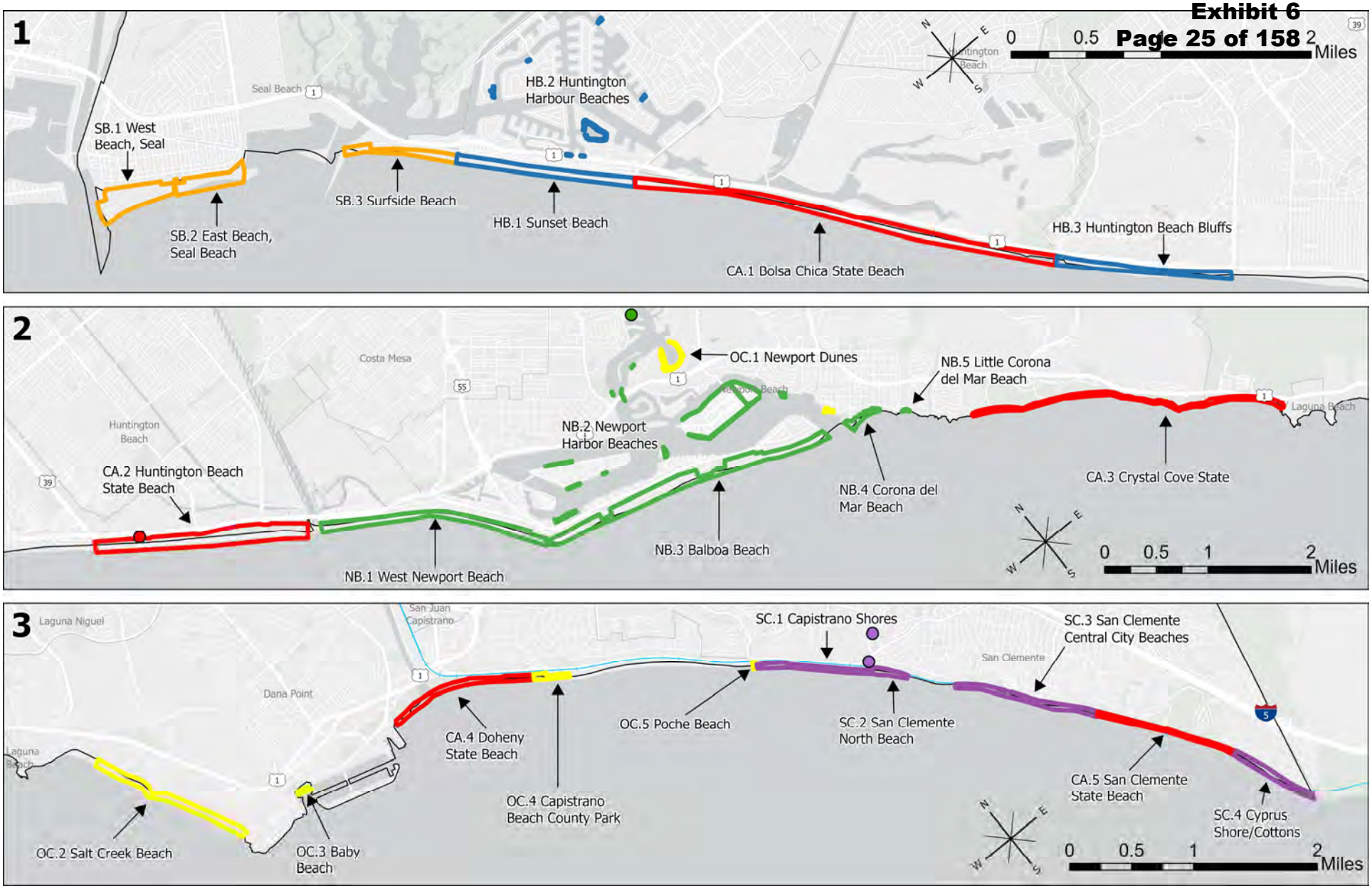

Figure 3-3. Zoomed-in Views of Receiver Site Locations (Showing Beach Managing Entity)

For each proposed beach receiver site, the following sub-sections include:

- General overview including a description and amenities/features of the receiver site.
- Rating based on need for sand; the most eroded beaches with the highest recreational use and/or the greatest potential for storm damage to adjacent infrastructure have a high need and the widest beaches with the lowest recreational use and/or lowest potential for storm damage have a low need.
- Table indicating presence of sensitive biological resources and surfing. The presence of onshore and nearshore biological resources is based on the biological assessment for this OC SCOUP (Merkel, 2025a). The surfing rating indicates the popularity of surfing at the site. The rating scale ranges from 0-4 and is based on the CRSMP (Everest et al, 2013); a rating of 0 indicates no surfing is available or is virtually non-existent and a rating of 4 indicates that surfing is extremely popular, such as at Cottons. For San Clemente sites, additional surf ratings are provided per a more recent study (Moffatt & Nichol, No Date).
- Table of historic beach nourishments, if any.
- Typical/representative per event and maximum per year beach fill volumes. The maximum volumes are inclusive of any other nourishment projects for the specific beach site, e.g., if sand was placed under the City of San Clemente's SCOUP to the maximum annual volume allowed under OC SCOUP, no further opportunistic nourishment will be allowed within that year.
- Figure showing the maximum limits (maximum envelope) of the sand fill, a typical fill footprint, and potential on-site construction staging/stockpile locations. The figure shows the maximum potential placement envelope for that specific receiver site over multiple events (multiple years); the actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill polygon but can occur anywhere within the bigger maximum extent envelope.
- Designated fill placement design(s) (as defined in Section 2.1).

To generally determine maximum beach fill quantities, a target beach width was determined based on a natural shoreline condition at the subject receiver site, typically 50 – 100 feet. The fill volume was calculated by a rule of thumb factor for a beach berm fill in southern California: 1.5 cubic yards of sand fill per 1 foot of beach width for every 1 linear foot of a beach shoreline length. For some beaches, such as West Seal Beach, fill estimates were based on estimates for dune creation/enhancement. To ensure these estimates were reasonable and environmentally suitable, a review of historic and/or upcoming nourishment projects (when available) and environmental conditions were examined for each receiver site.

Some of the potential receiver sites specified in this document currently receive sand on a semi-regular basis through already existing programs, such as the OCPW Ocean Outlets Maintenance Program (see Section 4.1.5). It is important to note that nourishment events from these programs will likely not provide the required volume of sand necessary to offset the coastal erosive forces contributing to beach width loss. Thus, while these beaches are nourished through other programs, it should not preclude them from being considered for this OC SCOUP program.

3.1 WEST BEACH, SEAL BEACH

The City of Seal Beach is the northernmost city within Orange County. It has roughly 1.5 miles of coastline that extends from the San Gabriel River to the west jetty of Anaheim Bay. Seal Beach Pier is located at the southwest end of Main Street in Seal Beach. Locals, Los Angeles and Orange County residents, and overnight visitors from the numerous hotels, summer rentals, and vacation homes nearby can be found patronizing the shops, bars, and restaurants that line the streets near the pier and beach. Most patrons of Seal Beach tend to gravitate towards Main Street and its attractions. At the beach, fishing, surfing, and volleyball are popular. The beach also offers lifeguard service, restrooms and showers, nearby food service, and a boardwalk. The boardwalk is used equally by locals and tourists walking between the Main Street and their residences. There are also two large parking lots on either side of the pier and plentiful free street parking. In the winter, crowds concentrate around the shops. (Everest et al, 2013).

3.1.1 Site Overview

The "West Beach" reach of Seal Beach is located northwest of the Seal Beach Pier and offers a wide beach with volleyball nets, restrooms and showers, and a small café and parking lot. Homes align the landward edge of the beach. This beach is less crowded than the one to the south of the pier. Kite surfing wind surfing, board surfing, body surfing, and boogie boarding are popular.

Based on the historic and current wide sandy beach, this is a LOW need receiver site.

3.1.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment /Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering/roosting)	None	Yes (3)	No

** For all sites, the surfing rating scale cited is based on the CRSMP (Everest et al, 2013): a rating of 0 indicates no surfing is available or is virtually non-existent. A rating of 4 indicates that surfing is extremely popular, such as Cottons.*

3.1.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location.

3.1.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	100,000

3.1.5 Beach Fill Placement Design

The proposed potential placement design at this site is creation/enhancement of backbeach dunes. See previous section 2.1 for typical planview and cross-section designs for this fill type. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-4. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.1.6 Construction Access, Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-4.

3.2 EAST BEACH, SEAL BEACH

3.2.1 Site Overview

This reach of Seal Beach is located southeast of the Seal Beach Pier and is less wide, but typically more crowded than the reach to the north. A public walkway runs along the back of the beach. Surfing, body surfing, and boogie boarding are popular. During the winter months, a sand dike is constructed to protect residences from winter storms.

Based on the CRSMP (Everest et al, 2013), this is a HIGH need receiver site.

3.2.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment /Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering/roosting)	None	Yes (3)	No

3.2.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
1963-1988 (Everest, 2013)	370,000	Anaheim Bay, West Beach, San Gabriel River	Unknown
1994-2015 (Noble, 2017)	400,000 (up to 100,000 in single project)	Offshore dredging and inland sources	City of Seal Beach

East Beach frequently (typically annually) receives sand via backpassing from West Beach, Seal Beach. Backpassing is the transportation of sediment from one coastal location to another where the receiver site is upcoast of the source location. The back-passed sand placed on East Beach is used to construct a dike during the winter for storm protection.

3.2.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	200,000

3.2.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm and beach dike and possibly below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-5. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.2.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-5. The construction staging area in the parking lot to the west of the pier could also be used for sand placement along East Beach. Although not shown in Figure 3-5, another potential staging area is at Barney's Beach within the Naval Weapons Station Seal Beach; this area was used for a previous East Beach sand placement project. The use of the Barney's Beach area avoids construction vehicle traffic along local streets but requires special approval by the U.S. Navy.

3.2.7 Other Beach Fill Considerations and/or Constraints

In order to avoid impact to the public, haul trucks could enter the East Beach placement site by approaching from Seal Beach Boulevard, entering the Naval Weapons Station via its western entry gate, and accessing the placement site via the Navy's western perimeter road. Special permissions and security arrangements must be made in advance with the Navy to use this access route.



Figure 3-4. West Beach, Seal Beach Sand Placement Area



Figure 3-5. East Beach, Seal Beach Sand Placement Area

3.3 SURFSIDE BEACH

3.3.1 Site Overview

Surfside is a private residential community within the City of Seal Beach, located between Anaheim Bay and Sunset Beach. This beach is primarily used by local families and a few surfers willing to make the walk from Sunset Beach to a wave that breaks near the base of the east jetty of Anaheim Bay. There are no facilities here and beach users from outside Surfside generally must park at Sunset Beach.

Based on the CRSMP (Everest et al, 2013), this is a HIGH need receiver site.

3.3.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering/roosting)	None	Yes (2)	No

3.3.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
1945-2009 (Everest, 2013)	20,000,000 (Multiple events, up to ~2,000,000 per event)	Offshore borrow sites, Anaheim Bay	USACE
2016	47,000	Huntington Harbour	OC Parks
2021	100,000*	Anaheim Bay	U.S. Navy
2023-2024	811,000	Offshore borrow site	USACE

** nearshore placement*

3.3.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

The 300,000 cy maximum annual fill volume is based on the USACE intent of placing 1,500,000 cy every five years (average of 300,000 cy per year).

3.3.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike, backbeach dunes, and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-6. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.3.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-6.

3.4 SUNSET BEACH

3.4.1 Site Overview

Sunset Beach is a residential community, within the City of Huntington Beach, with a wide sandy beach that offers free parking, restrooms and showers, lifeguards, and volleyball courts. Beach activities such as surfing, windsurfing and kite surfing dominate water sports, and many visitors can be found simply enjoying the sand and sun. There are numerous hotels in the area and many beach users are overnight tourists or visitors from Orange and Los Angeles Counties. There are a few restaurants in the immediate area. (Everest et al, 2013).

Based on the CRSMP (Everest et al, 2013), this is a high need receiver site. However, based on recent conditions and discussions with City staff, it is more of a MEDIUM need receiver site, experiencing periodic backland flooding from wave overtopping.

3.4.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering/roosting)	None	Yes (2)	No

3.4.3 Previous Nourishment Projects

The USACE projects listed above for Surfside Beach also provide beach nourishment for Sunset Beach.

3.4.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	200,000

3.4.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike, backbeach dunes, and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-7. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.4.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-7.

3.5 HUNTINGTON HARBOUR BEACHES

3.5.1 Site Overview

Huntington Harbour contains a small number of pocket beaches, some accompanied by parks and play areas. These beaches are used primarily by local residents and visitors to the marina. Recreational amenities such as lifeguards are very limited. Access is also difficult for non-residents. Kayak Beach is along Pacific Coast Highway and is a popular launching area for kayakers and standup paddleboarders.

Based on the relatively lower erosion rates of Huntington Harbour beaches, these are LOW and MEDIUM need receiver sites.

3.5.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	None	Eelgrass	No (0)	No

3.5.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2016-2017	17,500 (total for five harbor beach sites)	Santa Ana River	OCPW and City of Huntington Beach

3.5.4 Opportunistic Beach Fill Quantity

Minimum Fill Volume (cubic yards)	Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
1,000 per site (multiple sites within the harbor)	1,000 to 5,000, depending upon site	1,000 to 5,000, depending upon site

3.5.5 Beach Fill Placement Design

The proposed potential placement locations at the various harbor sites is a beach berm. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extents for opportunistic beach fill are shown in Figure 3-8. Individual opportunistic projects would occur within the bounds of these maximum shoreline extents.

3.5.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways for this site are shown in Figure 3-8. There is no/limited space for any sand stockpiling and construction equipment staging will be limited to along the streets.



Figure 3-6. Surfside Beach Sand Placement Area



Figure 3-7. Sunset Beach Sand Placement Area



Figure 3-8. Huntington Harbour Beaches Sand Placement Areas

3.6 BOLSA CHICA STATE BEACH

3.6.1 Site Overview

Bolsa Chica State Beach is located at the northern end of Huntington Beach. It is bounded by Warner Avenue to the north and Seapoint Street to the south and Pacific Coast Highway to the east. Amenities include plentiful parking, camping, restrooms and showers, lifeguards, a snack bar, and a beachside bike path. Just across Pacific Coast Highway is the Bolsa Chica Ecological Reserve that has hiking paths and conducts organized tours of the wetland and its inhabitants. Most of Bolsa Chica's visitors are local residents with a few overnight campers and their families. (Everest et al, 2013).

Based on the relatively wide sandy beach but subject to wave runup and overtopping during extreme storm events (such as in January 2023), this is a MEDIUM need receiver sites

3.6.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (nesting and overwintering) Critical Habitat Area	None	Yes (3)	No

3.6.3 Previous Nourishment Projects

Bolsa Chica State Beach has been and continues to be nourished as part of ongoing maintenance dredging of the Bolsa Chica Wetlands. A small berm directly south of the ocean outlet is continually nourished by sediment hydraulicly piped from the wetland. The total annual volume of sediment is unknown.

3.6.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.6.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike, and backbeach dunes. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-9 and Figure 3-10. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.6.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-9 and Figure 3-10.

3.6.7 Other Beach Fill Considerations and/or Constraints

Almost the entire stretch of Bolsa Chica State Beach is recognized as USFWS western snowy plover critical habitat area. Avoidance of these areas and/or seasonal work restrictions will likely be required at this receiver site.



Figure 3-9. Bolsa Chica State Beach Shoreline, Northern Extent



Figure 3-10. Bolsa Chica State Beach Shoreline, Southern Extent

3.7 HUNTINGTON BEACH BLUFFS

3.7.1 Site Overview

Huntington Beach Bluffs, also known as Dog Beach, is along the northern section of Huntington Beach, bordered by Seapoint Avenue to the north and Goldenwest Street to the south. This is one of the few locations in Orange County where dogs are allowed on the beach without a leash. The beach is very popular year-round with local residents and their pets. It is also popular with surfers attracted to the waves, which tend to be larger here than other nearby local beaches. Amenities are metered parking, seasonal lifeguard service, restrooms, and a pedestrian/bicycle trail. Huntington Beach Bluffs is owned by the California State Parks but is maintained/managed by the City of Huntington Beach via a Lease of State Lands.

Based on the CRSMP (Everest et al, 2013), this is a HIGH need receiver site.

3.7.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering)	Rocky reef	Yes (4)	No

3.7.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2006	400,000	Bolsa Chica Wetlands Restoration and Tidal Inlet	USFWS
2008-current	65,000 to 450,000, every 1-3 years	Bolsa Chica Wetlands Tidal Inlet	California State Lands Commission

3.7.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.7.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, backbeach bluff/cliff stabilization, and backbeach dunes. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and

volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-11. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.7.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-11.

3.7.7 Other Beach Fill Considerations and/or Constraints

As shown in Figure 3-11, there is the potential for sand to be placed on Huntington Beach Bluffs site by hydraulic pipeline transporting sand from the Bolsa Chica Tidal Inlet maintenance dredging.



Figure 3-11. Huntington Beach Bluffs Sand Placement Area

3.8 HUNTINGTON BEACH STATE BEACH

3.8.1 Site Overview

Huntington Beach State Beach is bordered by Pacific Coast Highway to the east, the Santa Ana River to the south, and Beach Blvd. to the north. It is a long and wide sandy beach that offers plentiful parking, volleyball, fire pits, lifeguards, restrooms and showers, seasonal snack stands, and a boardwalk. Although there is no overnight camping, the parking lot is often filled with RVs. (Everest et al, 2013).

Based on the CRSMP (Everest et al, 2013), this is a LOW need receiver site.

3.8.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion California Least Tern (nesting) Western Snowy Plover (nesting and overwintering) Critical Habitat Area	None	Yes (3)	No

3.8.3 Previous Nourishment Projects

As part of the OCPW Ocean Outlets Maintenance Program, sand from the Talbert Channel Ocean Outlet is used to nourish Huntington State Beach to the north and the beach area seaward of the Least Tern Nature Preserve to the south. Generally, clearing of sediment in Talbert Outlet is required twice per year and each maintenance event, includes excavation of approximately 15,000 cy of sediment from within the outlet. Periodically, the sediment trap within Talbert Outlet (approximately an additional 5,000 cubic yards) requires clearing.

These events along with other known nourishment events at Huntington State Beach are summarized in the following table:

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2009-2010	150,000	Huntington Beach Wetlands	Huntington Beach Wetlands Conservancy
1989-ongoing	5,000 – 15,000 per year	Talbert Channel Ocean Outlet Maintenance	OCPW

3.8.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	200,000

3.8.5 Beach Fill Placement Design

The proposed potential placement locations at this site are backbeach dunes and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-12 and Figure 3-13. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.8.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-12 and Figure 3-13.

3.8.7 Other Beach Fill Considerations and/or Constraints

There is a Least Tern Nature Reserve, which is also recognized as a USFWS western snowy plover critical habitat area located at the end of Huntington State Beach (as shown in Figure 3-13). Avoidance of these areas and/or seasonal work restrictions may be required if nourishment extends to the southern extent of this receiver site.

As shown in Figure 3-12 and Figure 3-13, the backbeach area along Huntington Beach State Beach will also be considered as a sand source site, as sand often builds up and blows over the bicycle/pedestrian path and into the parking lot. Approval of Huntington Beach State Beach as a sand source is proposed as part of the OC SCOUP permitting.



Figure 3-12. Huntington Beach State Beach Shoreline, Northern Extent



Figure 3-13. Huntington Beach State Beach Shoreline, Southern Extent

3.9 WEST NEWPORT BEACH

3.9.1 Site Overview

West Newport Beach is located to the west of Pacific Coast Highway, immediately south of Huntington Beach. Homes and condos align the landward edge the sandy beach. The beach offers volleyball courts, showers, and seasonally operated lifeguard towers. In the winter, when tower lifeguards are off duty, the surf and sand are observed by cameras atop each tower and by jeep patrols. This is also the case for the beaches to the south. West Newport Beach is a popular surfing destination. At the middle and southern end of the beach, eight rock jetties spaced about 300 feet apart (the "Newport groin field") inhibit sediment migration, creating reliable sandbars, making the waves break hollow, and attracting surfers.

A grassy park inland of the homes, along PCH, provides metered parking, restrooms, playgrounds, picnic tables, and at the southern end, racquetball, basketball, and tennis courts. Across Pacific Coast Highway are restaurants and hotels. This beach swells with tourists and locals in the summer and attracts a reduced but still consistent crowd in the winter, mostly local surfers, joggers, and families utilizing the park. A boardwalk extends along the peninsula which is heavily utilized by bikers and walkers year-round. (Everest et al, 2013). At the southern/eastern limit of this area is Newport Pier and McFadden Plaza, where there are numerous shops and restaurants, a bathroom and shower facility, a boardwalk, a playground and grassy area, and metered public parking.

Based on the CRSMP (Everest et al, 2013), this is a MEDIUM need receiver site.

3.9.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering)	Rocky reef	Yes (4)	No

** For all sites, the surfing rating scale cited is based on the CRSMP (Everest et al, 2013); a rating of 0 indicates no surfing is available or is virtually non-existent. A rate of 4 indicates that surfing is extremely popular.*

3.9.3 Previous Nourishment Projects

This is an existing beach receiver site for Santa Ana River (SAR) outlet sand under the ongoing OCPW Ocean Outlets Maintenance Program. Typically, clearing of sediment in the SAR outlet is required twice per year (once in the fall/winter and once in the spring/summer). In addition to these planned maintenance events, outlet clearing may be necessary during other times of the year to maintain flood control and/or to ensure tidal exchange with the Santa Ana River Marsh. The maximum volume of sediment removal per year is approximately 200,000 cubic yards.

These events along with other known nourishment events at West Newport Beach are summarized in the following table:

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
1935-2009 (Everest, 2013)	9,000,000	Santa Ana River, Balboa Peninsula, Newport Harbor	USACE
2016-2017	600,000	Santa Ana River	OCPW
2003-ongoing	20,000 – 200,000 per year	Santa Ana River Ocean Outlet Maintenance	OCPW
2023-2024	71,000	Santa Ana River	USACE

3.9.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.9.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, backbeach dunes, and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-14 and Figure 3-15. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope.

3.9.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-14 and Figure 3-15.

3.9.7 Other Beach Fill Considerations and/or Constraints

There is the potential for sand to be placed on West Newport Beach by hydraulic pipeline transporting sand from the Santa Ana River Marsh or Santa Ana River maintenance dredging. CEQA and permitting for the pipeline placement would be via the maintenance dredging projects.

3.10 BALBOA BEACH

3.10.1 Site Overview

Balboa Beach extends along the Balboa Peninsula, south of Newport Pier to the Newport Harbor entrance. The Balboa Pier plaza and beach here are similar to that of Newport Pier; there are numerous shops, a bathroom and shower facility, a boardwalk, a playground and grassy area, and metered public parking lots. There is also a café at the end of the pier. Surfing is less popular at Balboa Pier than at West Newport due to a steeply sloping beach and reduced wave quality, which has also made the pier popular for fishing. The beach to the south of Balboa Pier has similar characteristics to West Newport Beach, but with a smaller crowd. Street parking becomes scarcer as the peninsula thins, and the boardwalk ends about halfway down the beach. At the south end of the beach are a jetty and a small park offering views across the channel and into the bay. The jetty focuses waves to create the notorious Wedge surf break, attracting board and body surfers and boogie boarders during large swells. (Everest et al, 2013).

Based on the existing sandy beach width at Balboa Beach, this is a MEDIUM need receiver site.

3.10.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering) Critical Habitat Area	Rocky reef	Yes (1) Wedge (4)	No

3.10.3 Previous Nourishment Projects

Some of the Balboa Beach shoreline is an existing beach receiver site for Santa Ana River (SAR) outlet sand under the ongoing OCPW Ocean Outlets Maintenance Program. The past nourishment events are summarized in the table below:

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2019	10,000	SAR Ocean Outlet Maintenance	OCPW
2020	5,000	SAR Ocean Outlet Maintenance	OCPW
2021	5,000	SAR Ocean Outlet Maintenance	OCPW
2021	55,000 (nearshore placement)	Newport Bay Entrance Channel	USACE

3.10.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.10.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike, backbeach dunes, and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-16, Figure 3-17, and Figure 3-18. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.10.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-16, Figure 3-17, and Figure 3-18.

3.10.7 Other Beach Fill Considerations and/or Constraints

There is a USFWS western snowy plover critical habitat area located within the Balboa Beach shoreline (as shown in Figure 3-17 and Figure 3-18). Avoidance of these areas and/or seasonal work restrictions will likely be required at this receiver site.

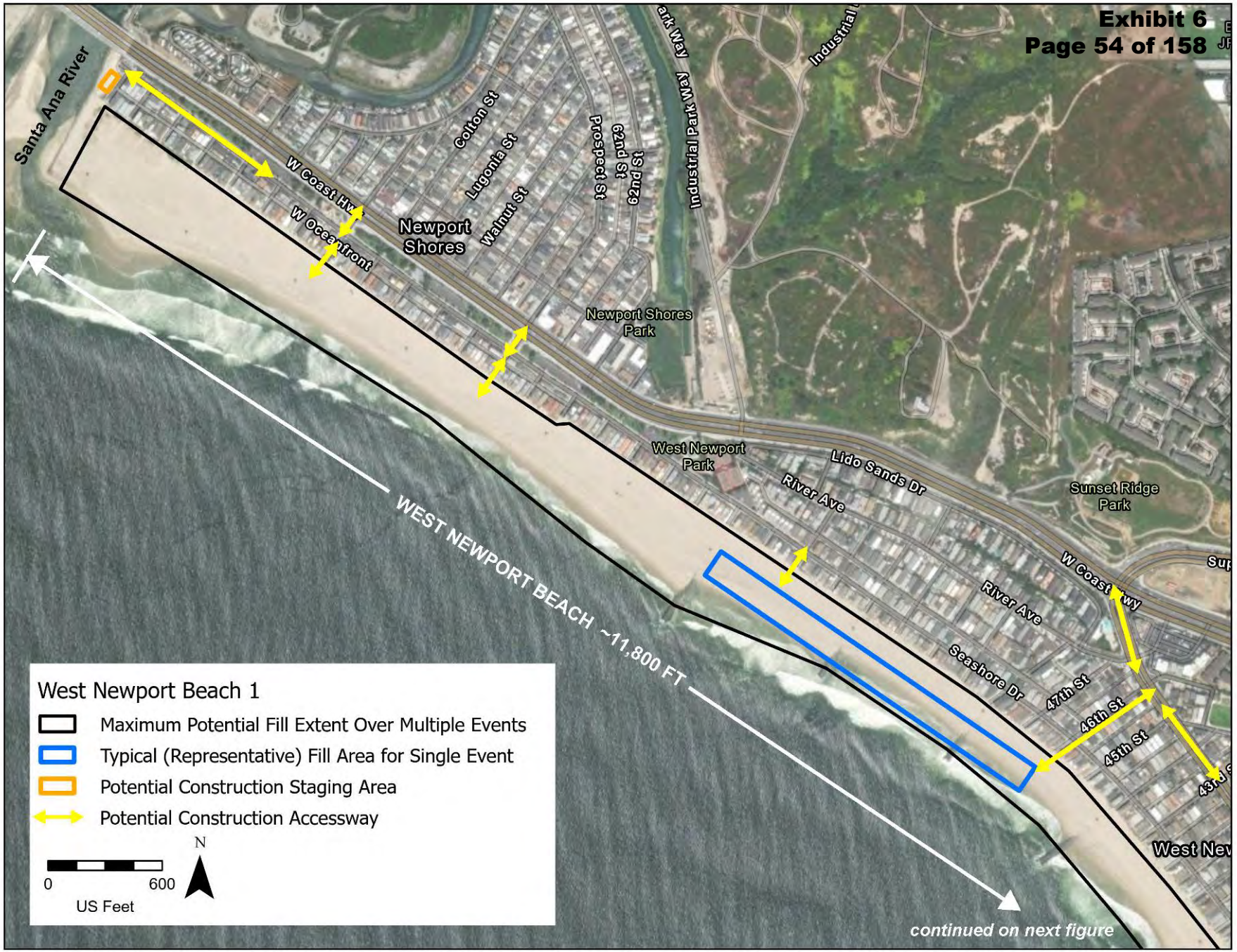

Figure 3-14. West Newport Beach Shoreline, Northern Extent



Figure 3-15. West Newport Beach Shoreline, Southern Extent



Figure 3-16. Balboa Beach Shoreline, Northern Extent



Figure 3-17. Balboa Beach Shoreline, Middle Extent



Figure 3-18. Balboa Beach Shoreline, Southern Extent

3.11 NEWPORT HARBOR BEACHES

3.11.1 Site Overview

There are 32 small beaches (including China Cove, Balboa Island, Bayside Beach (aka Harbor Patrol Beach), Bayside Village Marina, Balboa Marina, as well as others) located within Newport Harbor and Upper Newport Bay. Of these 32 beaches, two are owned/maintained by the County of Orange and the remaining are owned/maintained by the City of Newport Beach or within private areas. The beaches within the harbor are accessible mostly by residents of the homes adjoining the private docks, people who rent the houses seasonally, or homeowner associations. A study of visitation patterns on Balboa Island concluded that most (57 percent) visitors were local residents.

Attendance at these beaches is limited and concentrated mostly on the beaches with better access, such as Balboa Island and Marina Park. Many of the sandy stretches are quasi-private and relatively narrow and the frequent onshore boat mooring lines and residential docks also limit access and recreational value. This area contains a number of smaller beaches that have limited amenities and host perhaps 10,000 – 15,000 visitors per year, mostly in the summer.

China Cove is located on the east side of Newport Harbor Entrance Channel, northwest of Corona del Mar State Beach. There are two small sandy coves, separated by a row of houses that are both accessible via Cove Street or a footpath from Ocean Boulevard, where visitors must park. Other than a seasonal volleyball court in the north cove, there are no amenities here. The beach is located within the harbor and the waves are calm, so it serves as a useful launching point for kayaks or small watercraft. The beach is mostly used by locals, and in the winter the crowd drops to sporadic walkers and kayakers. (Everest et al, 2013).

Based on the CRSMP (Everest et al, 2013), beaches within Newport Harbor are HIGH and MEDIUM need receiver sites.

3.11.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	None	Eelgrass	No (0)	No

3.11.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2014	500 (China Cove)	Marina Park dredging	City of Newport Beach
2016-2017	10,000 (China Cove and Balboa Island)	Santa Ana River	OCPW and City of Newport Beach

3.11.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
1,000 to 10,000, depending upon site	1,000 to 10,000, depending upon site

3.11.5 Beach Fill Placement Design

The proposed potential placement location at the various harbor sites is beach berm. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification. The maximum shoreline extents for opportunistic beach fill are shown in Figure 3-19. Individual opportunistic projects would occur within the bounds of this maximum shoreline extent. The most likely sand receiver sites are shown in Figure 3-19, however any pocket beach within Newport Harbor is a potential receiver site as also identified in the City's Regional General Permit 54.

3.11.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-19. There is no/limited space for any sand stockpiling, and construction equipment staging will be limited to along the streets.

3.11.7 Other Beach Fill Considerations and/or Constraints

As a result of the recent Caulerpa outbreak in Newport Bay (see Section 4.2.6), all beach nourishment projects will need to adhere to the guidelines set forth in the Caulerpa Control Protocol (NMFS, 2021).

3.12 NEWPORT DUNES

3.12.1 Site Overview

The Newport Dunes Waterfront Resort is located in Upper Newport Bay and is owned by OC Parks. The resort includes a public beach, aquatic park, marina, RV camping, and resort amenities. The Newport Dunes marina and lagoon are periodically dredged and the dredge material is disposed at an offshore open ocean site.

Based on existing conditions, this is a LOW need receiver site.

3.12.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed within the MPA?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
Yes, Upper Newport Bay SMCA	TBD	None	Eelgrass	No	No

3.12.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location.

3.12.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	50,000

3.12.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm and backbeach storm dike. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-20. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.12.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-20.

3.12.7 Other Beach Fill Considerations and/or Constraints

Newport Dunes lagoon and marina are subject to maintenance dredging. The waterward extent of the sand placement will be limited by the lagoon dredge limits as shown in Figure 3-20.

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Figure 3-19. Newport Harbor Beaches Sand Placement Areas

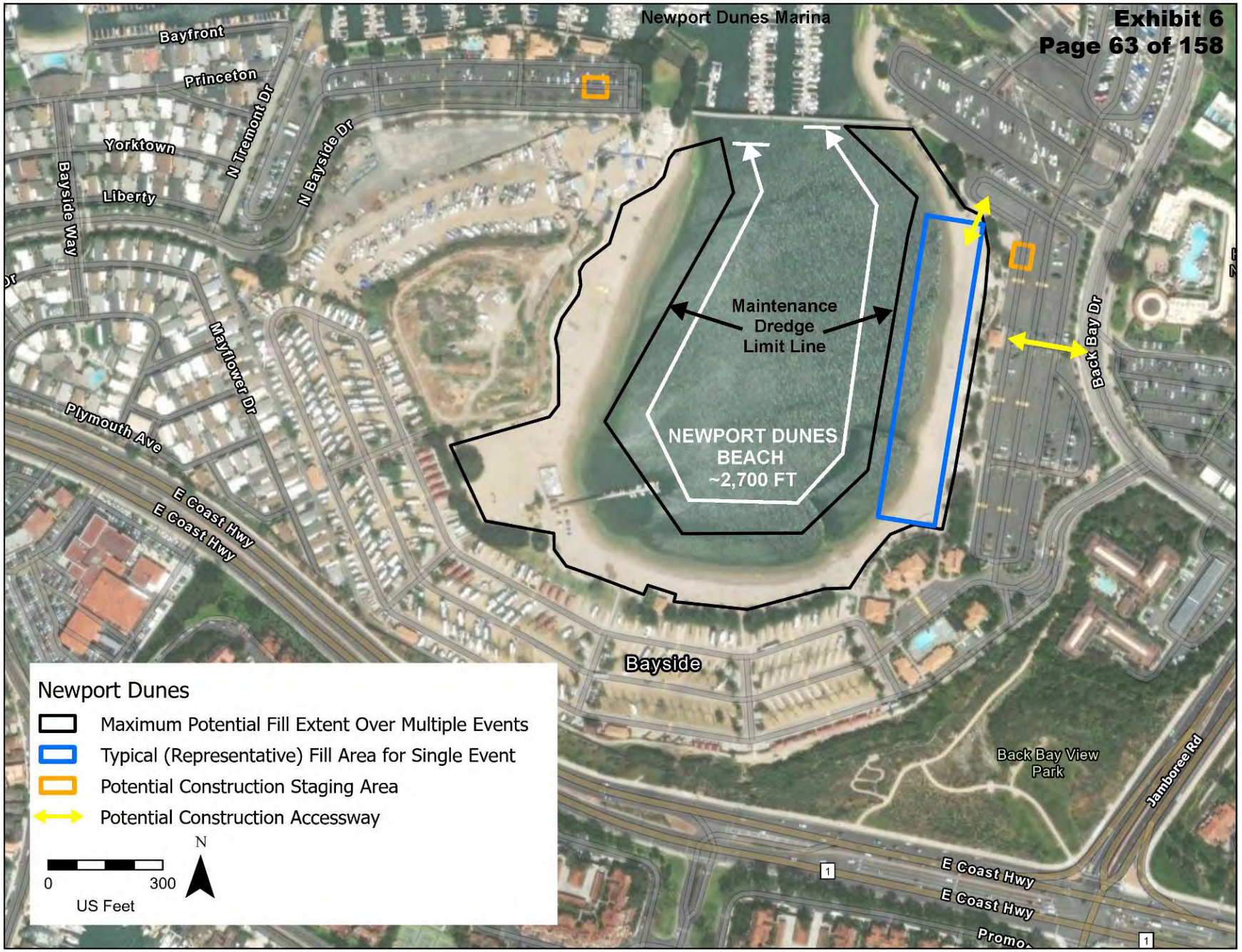

Figure 3-20. Newport Dunes Sand Placement Area

3.13 CORONA DEL MAR AND LITTLE CORONA DEL MAR BEACHES

3.13.1 Site Overview

Corona del Mar Beach is situated immediately east of the Newport Bay channel and southwest of Ocean Boulevard. A paid parking lot of over 500 spots is provided at the beach as well as street parking above the beach on the bluff. There are restrooms, showers, volleyball nets, lifeguards, and a restaurant on the beach. The beach, adjacent rocky points and bluff tops are used mostly by general beachgoers, many of them families local to the city or county. The ocean water at this beach is deep and the waves are usually calm. However, with a large south swell a wave forms along the jetty at the north end of the beach, attracting a steady stream of surfers. (Everest et al, 2013). Little Corona del Mar Beach (aka "Poppy's) is a small pocket beach with access only via a path from/to the top of the bluff to/from the beach. Both beaches are owned by the California State Parks but are maintained/managed by the City of Newport Beach via a Lease of State Lands.

Based on the CRSMP (Everest et al, 2013), this is a LOW need receiver site.

3.13.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed within the MPA?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
Yes, Crystal Cove SMCA	Yes	Grunion	Rocky reef Kelp Surfgrass	Yes (1)	No

3.13.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
Unknown (Everest, 2017)	1,000 per year	Unknown	Unknown

3.13.4 Opportunistic Beach Fill Quantity

	Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
Corona del Mar	50,000	100,000
Little Corona del Mar	5,000	5,000

3.13.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm (both Corona and Little Corona del Mar) and backbeach dunes (Corona del Mar only). See previous section 2.1 for typical

planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extents for opportunistic beach fill are shown by the black polygons in Figure 3-21. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.13.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-21.

3.13.7 Other Beach Fill Considerations and/or Constraints

Rocky reef (tidepools) exist in the intertidal area along the Little Corona del Mar shoreline; sand will not be placed within any rocky intertidal/reef areas.



Figure 3-21. Corona Del Mar State Beach Sand Placement Area

3.14 CRYSTAL COVE STATE BEACH

3.14.1 Site Overview

Wedged between Corona del Mar and Laguna Beach lies Crystal Cove State Park. There is a north and south entrance to the park, both located to the west of Pacific Coast Highway and each with its own parking and bathroom and shower facilities. Atop the bluff, there is a bike path that parallels the highway connecting the two entrances. At the mid-point is a small cafe crowded with park users and highway passers-by. Overall, Crystal Cove has parking for up to 400 cars. El Moro campground overlooks the ocean with 27 recreational vehicle and 30 tent sites. Also, guests stay in any of the 21 historical cottages nestled amongst the bluff. From atop the bluff, numerous trails lead down to the beach. The beach consists of three distinct coves with narrow sandy areas and rocky reefs abutting the water. The beach is very popular with overnight visitors and local and county residents year-round. The southernmost cove, known as El Moro, is a popular surfing spot during large summertime south swells, but in the winter is dormant. Off-season use consists mainly of walking the beach and trail and exploring the rocky point tide pools. (Everest et al, 2013).

Based on the existing narrow sandy beach, this is a HIGH need receiver site.

3.14.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed within the MPA?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
Yes, Crystal Cove SMCA	Yes	Grunion Western Snowy Plover (overwintering)	Rocky reef Kelp Surfgrass	Yes (2), El Moro	Limited

3.14.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2023	15,000	Talbert Channel Outlet/Santa Ana River Ocean Outlet	State Parks

3.14.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.14.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm and backbeach bluff/cliff stabilization. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-22 and Figure 3-23. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.14.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-22 and Figure 3-23.

3.14.7 Other Beach Fill Considerations and/or Constraints

Rocky reef (tidepools) exist in the intertidal area along some segments of the Crystal Cove shoreline; sand will not be placed within any rocky reef area.

As shown in Figure 3-22 and Figure 3-23, there is the potential for sand to be placed via conveyor belt from the Moro Campground lower parking lot via the PCH underpass or from Reef Point bluff-top parking lot via the ramp.

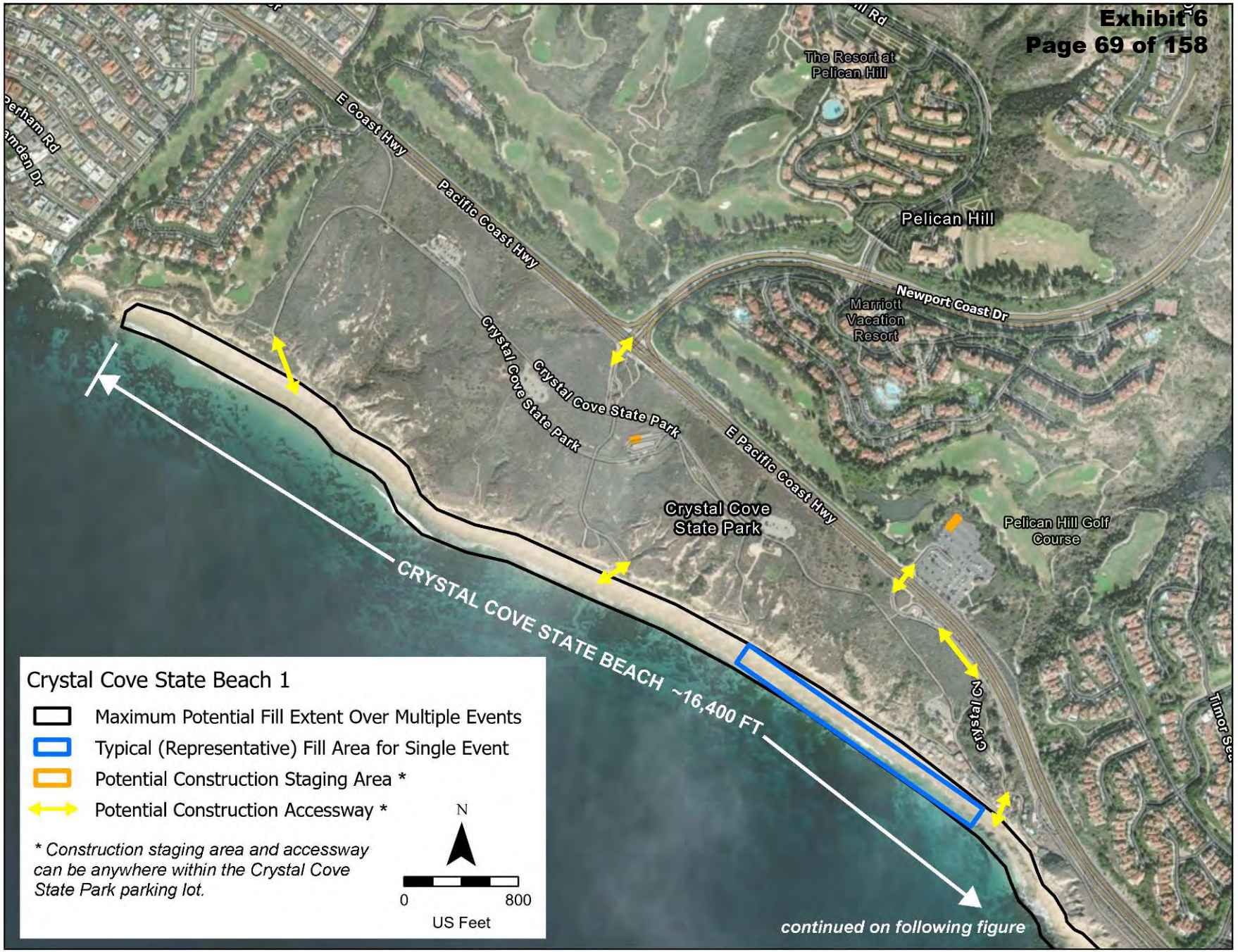

Figure 3-22. Crystal Cove State Park Shoreline, Northern Extent

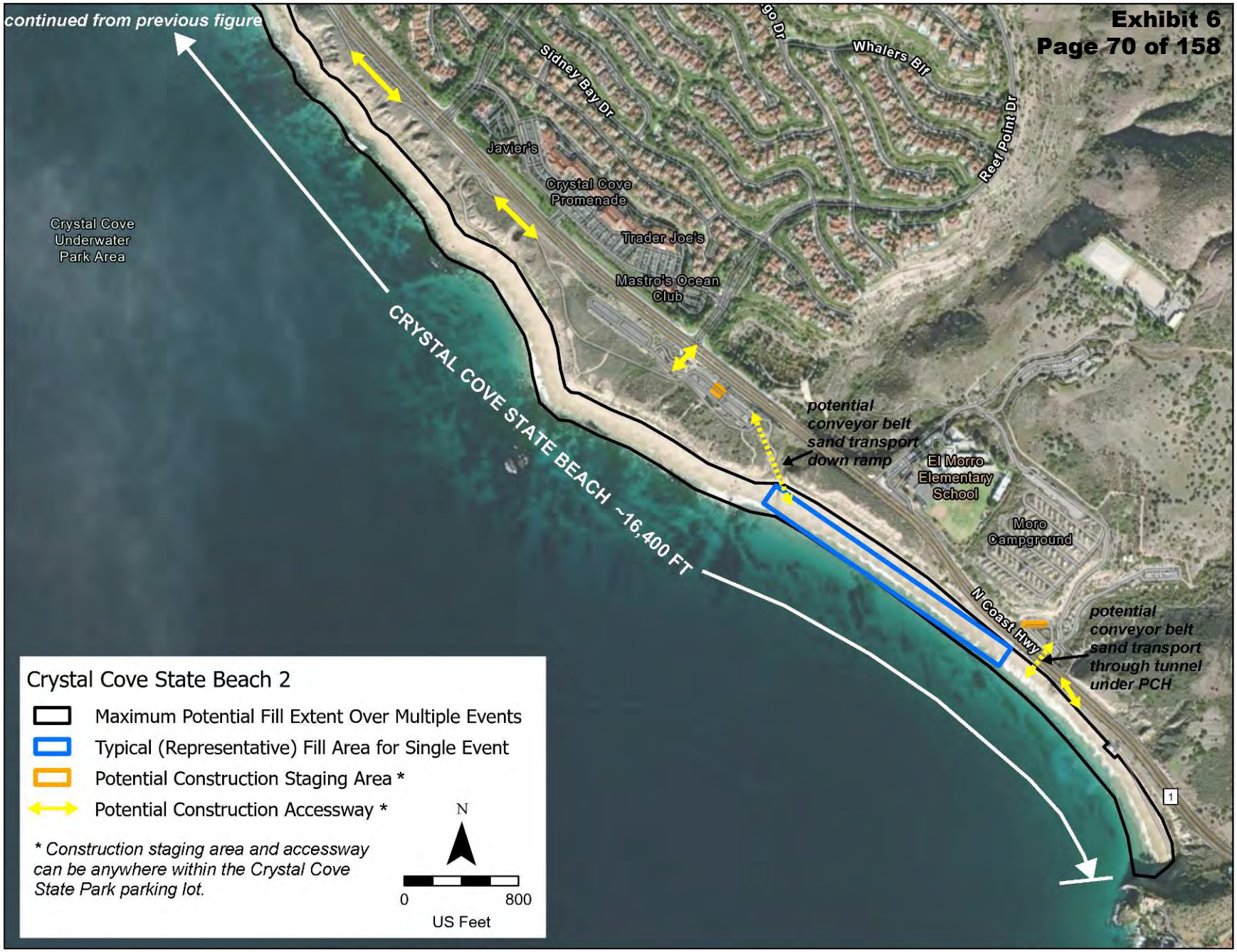

Figure 3-23. Crystal Cove State Park Shoreline, Southern Extent

3.15 SALT CREEK BEACH COUNTY PARK

3.15.1 Site Overview

Salt Creek Beach County Park includes the beaches of Salt Creek Beach and Dana Strands (aka "Strands Beach"). This is a popular year-round beach. It is located west of Pacific Coast Highway at the foot of Niguel Road and receives the majority of South Orange County residents pouring to the nearest beach from inland communities. It has over 1,000 parking spots and a variety of amenities are there to accommodate visitors. The beach includes a seasonal snack bar and lifeguards, bathrooms and showers, a large grassy area with picnic areas, volleyball courts and a basketball court. Salt Creek is also an important beach for surfing and bodyboarding. The majority of visitors are from Orange County communities, but the beach also has a consistent flow of overnight tourists; the Ritz Carlton is located just above the beach and the St. Regis just across the street. The southern portion of the beach, known as Dana Strands, has a funicular elevator to shuttle patrons down the steep bluff to the beach. (Everest et al, 2013).

The majority of Salt Creek Beach is owned/managed by OC Parks, with the exception of a small segment of shoreline at the far south end owned by the City of Dana Point.

Based on the existing sandy beach width, this is a MEDIUM need receiver site.

3.15.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed within MPA?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
Yes, Dana Point SMCA	TBD	Grunion Western Snowy Plover (overwintering)	Rocky Reef Kelp Surfgrass	Yes (4)	No

3.15.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location, with the exception of very small amounts of sand from OCPW's Salt Creek outlet maintenance. As part of the OCPW Ocean Outlets Maintenance Program sand from the Salt Creek Outlet located towards the northern extent of Salt Creek Beach is used to nourish roughly 0.20 acres of beach split into two areas, one just north the other just south of the channel outlet. Generally, clearing of sediment in the Salt Creek Outlet is required no more than twice per year (once in the fall and once in the following spring) and, for each maintenance event, includes excavation of approximately 1,000 cubic yards of sediment.

3.15.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	200,000

3.15.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm and backbeach dunes. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-24 and Figure 3-25. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.15.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-24 and Figure 3-25.

3.15.7 Other Beach Fill Considerations and/or Constraints

Rocky reef (tidepools) exist in the intertidal area along some segments of the Salt Creek Beach shoreline; sand will not be placed within any rocky reef area.

Placement within or directly adjacent to the Salt Creek outlet will be avoided to the extent practical so as to not block storm flows; however it should be noted that sand moves naturally along the shoreline and periodic sand blockage of the outlet is to be expected regardless of nourishment events.

Beach nourishment at the southern extent of Dana Stands, south of the Selva Road parking lot ramp, will likely be restricted to only low tide conditions given the limited current beach width.

3.16 BABY BEACH, DANA POINT HARBOR

3.16.1 Site Overview

At the northern end of Dana Point Harbor, southwest of Dana Point Harbor Drive, is a small sandy beach circumvented by a series of grassy areas and a small parking lot. Buoys denote a small swimming zone. This beach is mainly used by tourists and county residents who come to picnic while children swim safely in the still water. Kayak rentals are also available, and the beach serves as a safe and useful place to launch. Restroom and seasonal lifeguard service is provided, and the

snack bar at Dana Cove Beach is a short walk away. In the winter, attendance drops significantly. (Everest et al, 2013).

Based on the CRSMP (Everest et al, 2013), this is a LOW need receiver site.

3.16.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present	Coarse Sediment/ Cobble Naturally Present?
No	N/A	None	Eelgrass	No (0)	No

3.16.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2008	6,000	Dana Point Harbor maintenance dredging	County of Orange
2016	8,000	Dana Point Harbor maintenance dredging	County of Orange

3.16.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
5,000	10,000

3.16.5 Beach Fill Placement Design

The proposed potential placement location at this site is beach berm. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-26. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.16.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-26.



Figure 3-24. Salt Creek Beach Shoreline, Northen Extent (Salt Creek County Beach Park)



Figure 3-25. Salt Creek Beach Shoreline, Southern Extent (Dana Strands)



Figure 3-26. Baby Beach Sand Placement Area

3.17 DOHENY STATE BEACH

3.17.1 Site Overview

Doheny State Beach is located east of Dana Point Harbor, at the intersection of Pacific Coast Highway and Dana Point Harbor Drive. Amenities include lifeguards, a snack bar, bathrooms, showers, volleyball nets, barbeques, picnic areas, fire pits, and camping areas. The beach is popular year-round with overnight tourists, and local and county residents. There are a few reefs and a river mouth sandbar that produce soft but well-shaped waves that are popular with longboard and novice surfers and also make the waves safe for children. There is also a large grassy area that is used in the summertime for concerts and events and otherwise is often crowded with visitors playing a range of games. In the park, there are 120 camping sites, and also many hotels in the area. (Everest et al, 2013).

The CRSMP (Everest et al, 2013) identified this is a medium need receiver site, however increased erosion over the past decade has now caused this to be a HIGH need receiver site.

3.17.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering)	Rocky reef Kelp	Yes (4)	Yes

3.17.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
1964	94,000	San Juan Creek	Unknown
1966	842,000	Camp Pendleton	USACE
1969	365,000	San Juan Creek	Unknown
1970	125,000	Dana Point Harbor construction	USACE
2023	25,000	Santa Ana River	County of Orange and CA State Parks

3.17.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.17.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike and possibly backbeach dunes. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-27. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.17.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-27.

3.17.7 Other Beach Fill Considerations and/or Constraints

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach.

3.18 CAPISTRANO BEACH COUNTY PARK

3.18.1 Site Overview

Capistrano Beach County Park is located directly west of Coast Highway on Beach Road. The narrow beach is used mostly by county residents and overnight tourists from the nearby hotels. In the summer, amenities here are plentiful and the waves are calm, attracting families who can safely swim. A large parking lot provides metered spaces. (Everest et al, 2013).

Based on the CRSMP (Everest et al, 2013), this is a HIGH need receiver site.

3.18.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion	Rocky reef Kelp Surfgrass	No (0)	Yes

3.18.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
1969	212,000		Unknown
1999-2000	32,000	Dana Point Harbor maintenance dredging	County of Orange
2009	48,000	Dana Point Harbor maintenance dredging	County of Orange
2016	65,000	Dana Point Harbor maintenance dredging	County of Orange
2023	20,000	Santa Ana River	County of Orange
2024	20,000	Santa Ana River	County of Orange

3.18.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	150,000

3.18.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike and possibly backbeach dunes. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-28. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.18.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-28.

3.18.7 Other Beach Fill Considerations and/or Constraints

Placement within or directly adjacent to the storm drain culvert outlet will be avoided to the extent practical so as to not block storm flows; however it should be noted that sand moves naturally along the shoreline and periodic sand blockage of the outlet is to be expected regardless of nourishment events.

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach.

3.19 POCHE BEACH COUNTY PARK

3.19.1 Site Overview

Poche Beach is a little pocket beach at the very south end of Dana Point, in between the private homeowner communities of Capistrano Bay District and Capistrano Shores. Within the beach area, Poche Creek (or Prima Deshecha Cañada storm drain) empties to the ocean. Accessing this beach is difficult as there is no parking on this section of Pacific Coast Highway nor El Camino Real and surrounding communities are gated.

Based on the narrow sandy beach, this is a HIGH need receiver site.

3.19.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion	Rocky reef Kelp Surfgrass	Yes (1)	Yes

3.19.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location.

3.19.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
1,000	1,000

3.19.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm and beach dike. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-29. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within

the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.19.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessway for this site are shown in Figure 3-29. Due to limited space and the narrow Beach Road accessway, any needed construction staging area would be within the Capistrano Beach County Park parking lot.

3.19.7 Other Beach Fill Considerations and/or Constraints

Given this receiver beach's proximity to the railroad, there may be the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach.



Figure 3-27. Doheny State Beach Sand Placement Area



Figure 3-28. Capistrano Beach County Park Sand Placement Area

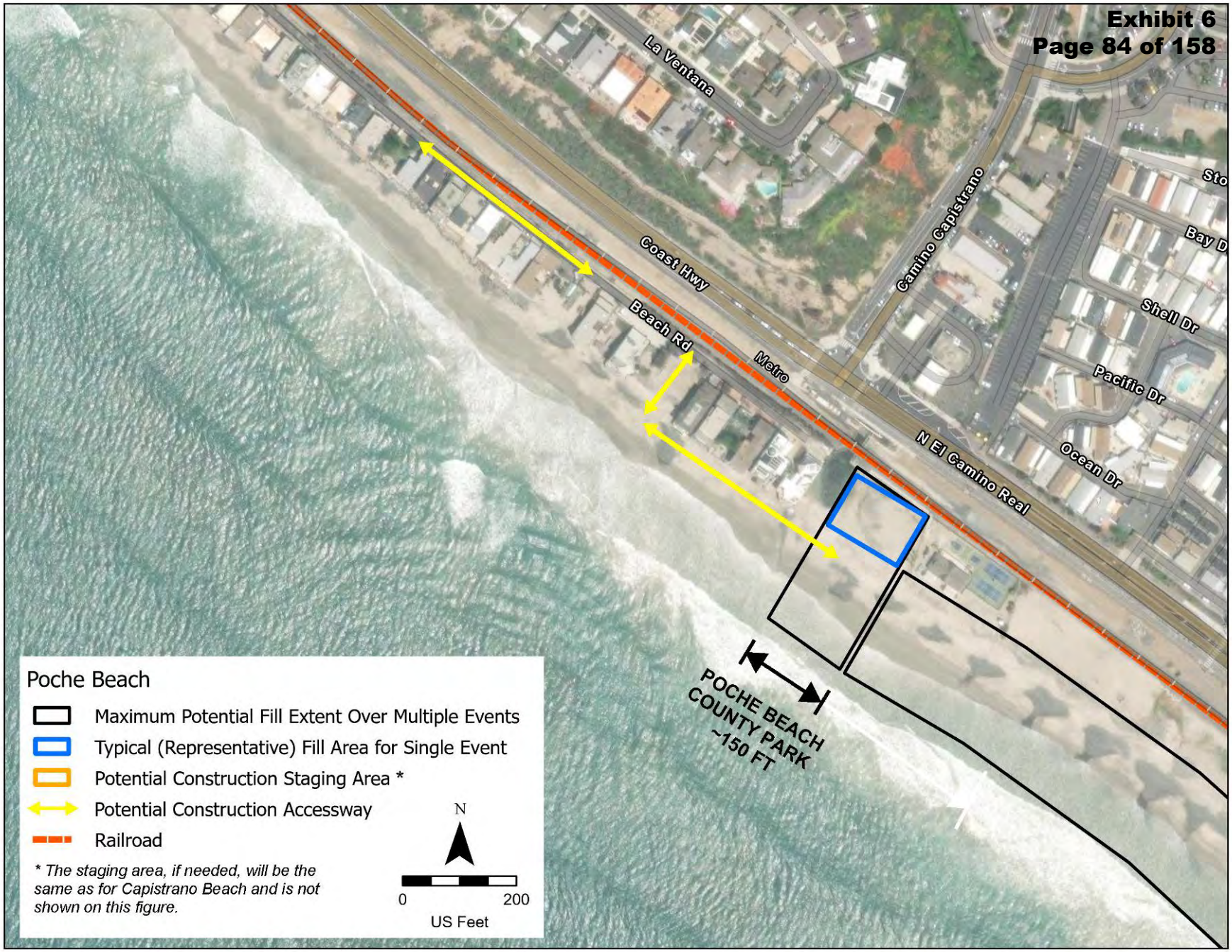

Figure 3-29. Poche Beach Sand Placement Area

3.20 CAPISTRANO SHORES

3.20.1 Site Overview

Capistrano Shores is a beachfront community within the City of San Clemente. The community consists of approximately 90 homes along the shoreline, which are accessed by a single entrance and a roadway along the landward side of the homes. Similar to Capistrano Bay District, the sandy beach is extremely narrow and many homes are protected by rock revetment and seawalls. This segment also includes the "Shorecliffs" area at the north end of the Capistrano Shores community.

Based on the extremely narrow sandy beach and its "Critical" erosion hot spot rating per Moffatt & Nichol, 2023b, this is a HIGH need receiver site.

3.20.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment /Cobble Naturally Present?
No	N/A	Grunion	Rocky reef Kelp	No (0) Northern most end is "Lowest Priority" surf spot per M&N (no date)	Yes

3.20.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location.

3.20.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.20.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm and beach dike. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-30. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment

event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.20.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-30. Note that there is limited space for construction vehicle parking along Beach Road and thus the construction staging area will be the same one used for North Beach, San Clemente.

3.20.7 Other Beach Fill Considerations and/or Constraints

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach, although sidecar dumping in the immediate vicinity will likely be difficult due to the density of private residences.

3.21 NORTH BEACH, SAN CLEMENTE

3.21.1 Site Overview

The northern section of San Clemente's coast is, for the most part, a thin stretch of sand just west of the railroad tracks that caters to surfers. The width of the beach depends on the tide. These beaches can be reached via pedestrian paths off of Mariposa and Buena Vista streets and parking is limited to the residential streets. The exception is at the north end, where a metered parking lot of about 250 spots located just across El Camino Real caters to the patrons of the Ole Hanson Beach Club, a Metrolink station, and a wide beach that has seasonal lifeguards and snack bar, and a playground and restrooms. This beach is popular with bodyboarders and local and county families in the summertime, but in winter is popular for surfing. The north end is also where the San Clemente Pedestrian Beach Trail begins. (Everest et al, 2013).

The CRSMP (Everest et al, 2013) identified this is a medium need receiver site. However, increased erosion over the past decade and its "Threatened" erosion hot spot rating per Moffatt & Nichol, 2023b, it is now a HIGH need receiver site.

3.21.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion	Rocky reef Kelp Surfgrass	Yes (3) "Lowest Priority" surf spot per M&N (no date)	Yes

3.21.3 Previous Nourishment Projects

As part of the OCPW Ocean Outlets Maintenance Program sand from the Segunda Deschecha Canada Outlet (M02) located at the northwestern extent of North Beach is used to nourish roughly 0.20 acres of beach directly southeast of the outlet. Generally, clearing of sediment in the Segunda Deschecha Outlet is required no more than twice per year (once in the fall and once in the following spring) and, for each maintenance event, includes excavation of approximately 1,000 cubic yards of sediment.

Other known nourishment events at North Beach are as follows:

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
2005	5,000	Santa Ana River	City of San Clemente and OCPW
2016-2017	12,000	Santa Ana River	City of San Clemente and OCPW
2024	37,000	Santa Ana River	City of San Clemente and OCPW
2025	2,500	Palm Springs quarry	OCTA

3.21.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
50,000	150,000

3.21.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-31. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.21.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-31.

3.21.7 Other Beach Fill Considerations and/or Constraints

Placement within or directly adjacent to the Segunda Deschecha (M02) storm drain outlet will be avoided to the extent practical so as to not block storm flows; however it should be noted that sand moves naturally along the shoreline and periodic sand blockage of the outlet is to be expected

regardless of nourishment events; OCPW has a separate ocean outlets maintenance program to clear sand within the storm drain outlet. Further, special precautions may be needed for construction vehicles travel over the storm drain outlet to protect the outlet structure.

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach and/or directly along the beach.

3.22 SAN CLEMENTE CENTRAL CITY BEACHES (MARIPOSA, PIER, T-STREET, AND BOCA DEL CANON)

3.22.1 Site Overview

At the foot of Avenida del Mar, at the center of San Clemente, is the San Clemente Pier; the San Clemente city beaches stretch to the north and south. There are a few hotels and numerous condominiums located nearby, so overnight tourists represent a significant source of tourism, especially in the summer. The Pier is also popular with local and county residents who surf, bodyboard, fish, or dine at the restaurants on the pier, the snack bar on the beach, or any of the establishments located across the street from the beach in the area known as the "Pier Bowl". Additional amenities at the beach include bathroom and shower facilities, shaded picnic areas, and a playground. Just north of the pier is the San Clemente City Lifeguard Headquarters. Farther north of the Pier is Linda Lane Beach Park, located at the base of Linda Lane. This beach has similar amenities to the Pier and is just a short walk away. This beach, however, is slightly less crowded and caters more to local and county families.

Farther south from the San Clemente Pier is the "T-Street" beach. T-Street Beach is a popular surfing destination located at the intersection of Esplanade and W. Paseo de Cristobal. A pedestrian bridge leads over the railroad tracks to the beach where there are lifeguards, a seasonal snack bar, a restroom, and shower facilities. T-Street is very popular with locals and county residents year-round. In the summer, surfing is prohibited from 10am to 6pm, and swimmers, bodyboarders, and sunbathers dominate the wide sandy beach. During summer mornings and evenings, and in the winter, surfing is popular at the centrally located reef break. (Everest, 2013).

Based on the CRSMP (Everest et al, 2013) and the "Critical" and "Threatened" erosion hot spot ratings along this shoreline per Moffatt & Nichol, 2023b, this is a HIGH need receiver site, although it should be noted that Pier, T-Street, and Boca del Canon beaches benefitted from the 2024 USACE and City beach nourishment project and are currently (as of 2026) in more of a MEDIUM need condition.

3.22.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion	Rocky reef Kelp Surfgrass	Yes (3) Multiple "High Quality", "Second Tier" and "Mediocre" surf spots per M&N (no date)	No

3.22.3 Previous Nourishment Projects

Year	Approximate Volume (cubic yards)	Sand Source	Project Owner
1964*	300,000	Upland construction of SONGS Power Plant	Southern California Edison
2024	196,000	Offshore borrow site	USACE and City of San Clemente

** It is not clear specifically where in San Clemente this sand was placed.*

3.22.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.22.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike, backbeach dunes, and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-32. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.22.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-32.

3.22.7 Other Beach Fill Considerations and/or Constraints

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach and/or directly onto the beach.



Figure 3-30. Capistrano Shores Sand Placement Area

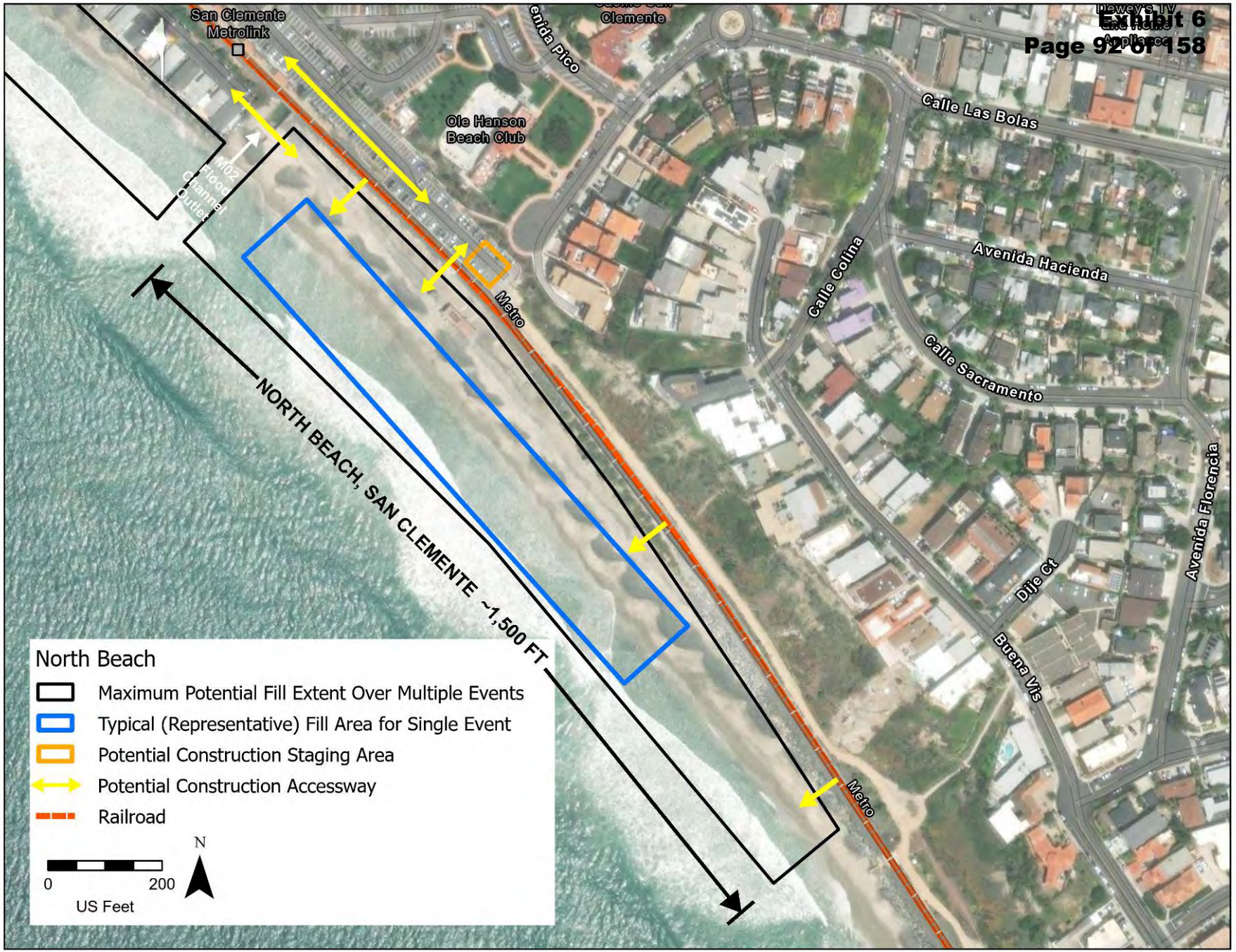

Figure 3-31. San Clemente North Beach Sand Placement Area

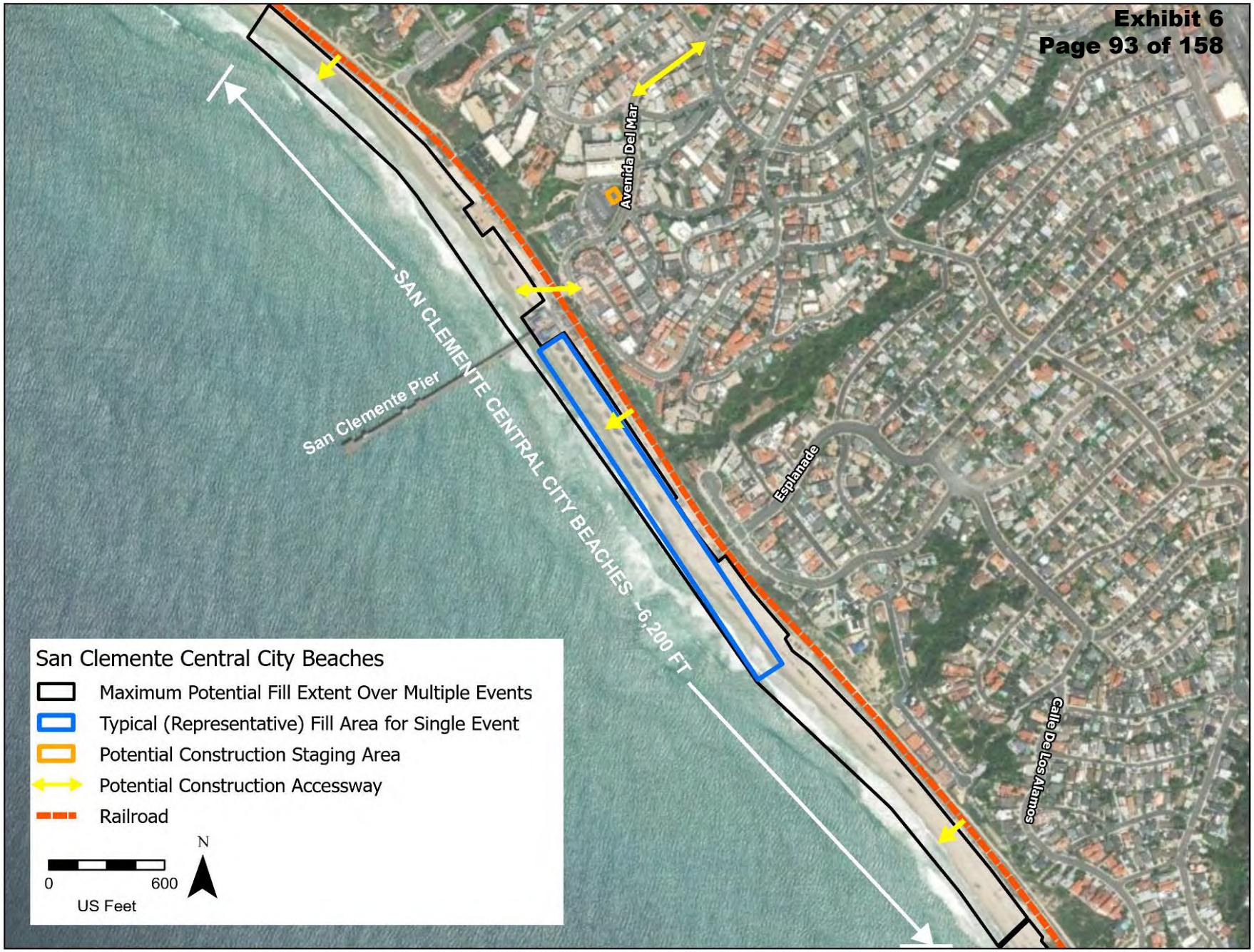

Figure 3-32. San Clemente Central City Beaches Sand Placement Area

3.23 SAN CLEMENTE STATE BEACH

3.23.1 Site Overview

San Clemente State Beach can be reached off Avenida Calafia which intersects the I-5 freeway. The park provides around 150 campsites, year-round lifeguard service, and restroom and shower facilities. Trails from the bluff top park lead to the beach. In the summer months, the beach and campground are filled with overnight visitors. In the winter, mostly local surfers remain. Where Avenida Calafia terminates near the beach is the San Clemente State Beach - Calafia. The state provides a metered parking lot of 190 spots, a restroom and shower facility, and seasonal food and lifeguard service. The beach here is narrower than the beaches to the north or south, nevertheless due to the available amenities it is heavily populated by local, county, and tourist beachgoers when the weather is favorable. In the winter, surfers remain. The San Clemente Inn is just a few blocks from this beach and a few other hotels are located east of the freeway. (Everest et al, 2013). The railroad runs along the back of the beach.

Based on the existing beach widths and its "Stable" rating per Moffatt & Nichol, 2023b, this is a MEDIUM need receiver site.

3.23.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion	Rocky reef Kelp Surfgrass	Yes (3) Multiple "Second Tier" surf spots per M&N (no date)	No

3.23.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location.

3.23.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.23.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike, backbeach dunes, and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume

available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-33. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.23.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-33.

3.23.7 Other Beach Fill Considerations and/or Constraints

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach and/or directly onto the beach. Also, as shown in Figure 3-33, there is the potential for sand to be placed via conveyor belt from the upper Group Campsite 2 parking lot. Sand haul over the railroad from the lower Califia parking lot will require infrastructure improvements to the railroad at-grade crossing and the existing stairway on the beach side of the railroad. These infrastructure improvements would also greatly benefit State Parks lifeguard and beach maintenance services.

3.24 CYPRUS SHORE / COTTONS

3.24.1 Site Overview

The beach backing Cottons surf break is in the City of San Clemente, between San Clemente State Beach and the Orange County Border. It is the northernmost beach in the Trestles area, accessible via a paved path off of Christianitos Road that runs to Trestles (through San Onofre State Beach and the San Mateo Wetlands). Parking is available on the east side of the I-5 in a paid lot of just over 100 spots or on the adjacent street. There are no amenities here apart from a pit toilet at the base of the path. Cottons is a well-regarded surfing destination, and the beach is primarily used by surfers. In the winter, the demographic is mostly local and southern California residents, however in the summer the beach is crowded with traveling surfers. Cottons is also the location of President Nixon's Western White House, La Casa Pacifica, which sits atop Cottons overlooking the ocean. (Everest et al, 2013). The railroad runs along the back of the beach.

Based on the narrow sandy beach and its "Critical" erosion hot spot rating per Moffatt & Nichol, 2023b, this is a HIGH need receiver site.

3.24.2 Biological and Surfing Resources

Within MPA?	If within MPA, Is Sediment Placement Allowed?	Onshore Sensitive Species Present	Nearshore Sensitive Habitat Present	Recreational Surfing Present (and Rating*)	Coarse Sediment/ Cobble Naturally Present?
No	N/A	Grunion Western Snowy Plover (overwintering)	Rocky reef Kelp Surfgrass	Yes (4) Multiple "High Quality" and "Second Tier" surf spots per M&N (no date)	Yes

3.24.3 Previous Nourishment Projects

There are no known previous nourishment projects in this location.

3.24.4 Opportunistic Beach Fill Quantity

Typical Fill Volume per Event (cubic yards)	Maximum Fill Volume per Year (cubic yards)
100,000	300,000

3.24.5 Beach Fill Placement Design

The proposed potential placement locations at this site are beach berm, beach dike and below MHTL. See previous section 2.1 for typical planview and cross-section designs for these fill types. When an opportunistic project arises, the specific beach fill final design plans will be developed by the receiving beach owner (based on source sand grain size and volume available and beach conditions at the time) and provided as part of the pre-construction notification.

The maximum shoreline extent for opportunistic beach fill is shown by the black polygon in Figure 3-34. The overall maximum footprint (black polygon) is based on the potential fill placement design(s), e.g., backbeach dunes. Individual opportunistic projects would occur within the bounds of this maximum footprint. The actual fill footprint per opportunistic nourishment event will be much smaller as shown by the representative/typical sand fill blue polygon but can occur anywhere within the bigger maximum extent envelope

3.24.6 Construction Staging and On-Site Stockpile Location(s)

The potential construction accessways and staging and stockpile areas for this site are shown in Figure 3-34.

3.24.7 Other Beach Fill Considerations and/or Constraints

Given this receiver beach's proximity to the railroad, there is the potential for the transportation of sand from upland sources via train and sidecar dumping of sand in a stockpile area adjacent to the beach and/or directly onto the beach.



Figure 3-33. San Clemente State Beach Sand Placement Area



Figure 3-34. Cyprus Shore / Cottons Beach Sand Placement Area

3.25 SUMMARY TABLE

The following provides a summary of the potential receiver sites' sand fill volumes and need.

Table 3-1. Receiver Sites Summary Table

Receiver Site	Responsible Agency	Need*	Typical Per Event Fill (cubic yards)	Annual Maximum Fill (cubic yards)
West Beach, Seal Beach	City of Seal Beach	Low	50,000	100,000
East Beach, Seal Beach	City of Seal Beach	High	50,000	200,000
Surfside Beach	City of Seal Beach	High	100,000	300,000
Sunset Beach	City of Huntington Beach	Medium	100,000	200,000
Huntington Harbour Beaches	City of Huntington Beach	Low and Medium	1,000-5,000	1,000-5,000
Bolsa Chica State Beach	California State Parks	Medium	100,000	300,000
Huntington Beach Bluffs	City of Huntington Beach (under lease from CSLC)	High	100,000	300,000
Huntington Beach State Beach	California State Parks	Low	50,000	200,000
West Newport Beach	City of Newport Beach	Medium	100,000	300,000
Balboa Beach	City of Newport Beach	Medium	100,000	300,000
Newport Harbor Beaches	City of Newport Beach and OC Parks	High and Medium	1,000-10,000	1,000-10,000
Newport Dunes	OC Parks	Low	50,000	50,000
Corona del Mar Beach	City of Newport Beach (under lease from CSLC)	Low	50,000	100,000
Little Corona del Mar Beach	City of Newport Beach (under lease from CSLC)	Low	5,000	5,000
Crystal Cove State Park	California State Parks	High	100,000	300,000
Salt Creek Beach	OC Parks	Medium	50,000	200,000
Baby Beach	OC Parks	Low	5,000	10,000
Doheny State Beach	California State Parks	High	100,000	300,000
Capistrano Beach County Park	OC Parks	High	50,000	150,000
Poche Beach	OC Parks	High	1,000	1,000
Capistrano Shores	City of San Clemente	High	100,000	300,000
San Clemente North Beach	City of San Clemente	High	50,000	150,000
San Clemente Central City Beaches	City of San Clemente	High	100,000	300,000
San Clemente State Beach	California State Parks	Medium	100,000	300,000
Cyprus Shore/Cottons	City of San Clemente	High	100,000	300,000

**"Need" is based on a combination of beach conditions and recreational opportunities offered. The most eroded beaches with the highest recreational use and the greatest potential for storm damage have a high need and the widest beaches with lowest recreational use and lowest potential for storm damage have a low need.*

4.0 POTENTIAL SAND SOURCES

Potential sand sources have been identified, including sediment detention basins, lakes, dams, rivers, creeks, channels, storm drains, wetlands, marshes, ocean outlets, quarries, and construction sites. Figure 4-1 generally shows these potential sediment source sites along with potential stockpile sites with interval distances in miles away from the coast. This section provides information on these sources where data is available.

Note that the sand sources to be utilized in this program are not limited to specific sites listed herein, i.e., sand from any potential opportunistic source site could be utilized as long as the sediment meets the required beach placement criteria. This section is intended to help to understand the general potential characteristics of the source sediment.

4.1 POTENTIAL SOURCE LOCATIONS

A representative list of potential sources was created and is provided in Appendix A.1. The list includes rivers/creeks/channels/storm drains where excavation/dredging has previously occurred or have been recommend for inclusion by sediment source managers. Some of the potential sources in this category are provided in the USACE Regional General Permit 100 (RGP 100) which includes an extensive list of permitted reaches from major rivers as well as smaller creeks, channels, and storm drains within Orange County Flood Control Division (OCFCD) rights-of-way and maintained by OCPW.

As previously discussed, the premise of this OC SCOUP program is that removal/excavation of sediments at the source site is already approved separate from the SCOUP program[2]. For example, OCPW currently removes sediment from its flood facilities for maintenance purposes, generally under several authorizations:

- Regional General Permit (RGP) 100 – OCPW Countywide Long-term Routine Maintenance Program - covers maintenance activities including sediment removal throughout 13 watersheds of Orange County
- Foothill Sediment Detention Basins including Agua Chinon, Bee Canyon, East Hicks Canyon, Hicks Canyon, Lower Peters Canyon, Orchard Estates, Round Canyon, and Trabuco
- San Diego Creek between the two intersections with the I-405
- San Diego Creek downstream of the I-405
- Permits for the OC Ocean Outlets Maintenance Program – for sediment removal in the Santa Ana River, Talbert Channel, Salt Creek, Segunda Deschecha, and Estrella outlets.
- Case-by-case sediment removal permits

Sediment source opportunities may also arise in the *SediMatch* database https://sedimatch.sfei.org. *SediMatch* is a planning tool to assist entities in identifying potential matches between those needing sediment and those with sediment available.

[2] The exception to this is source sand from Huntington Beach State Beach, discussed in Section 4.1.8, which is proposed for approval as a source site under OC SCOUP.

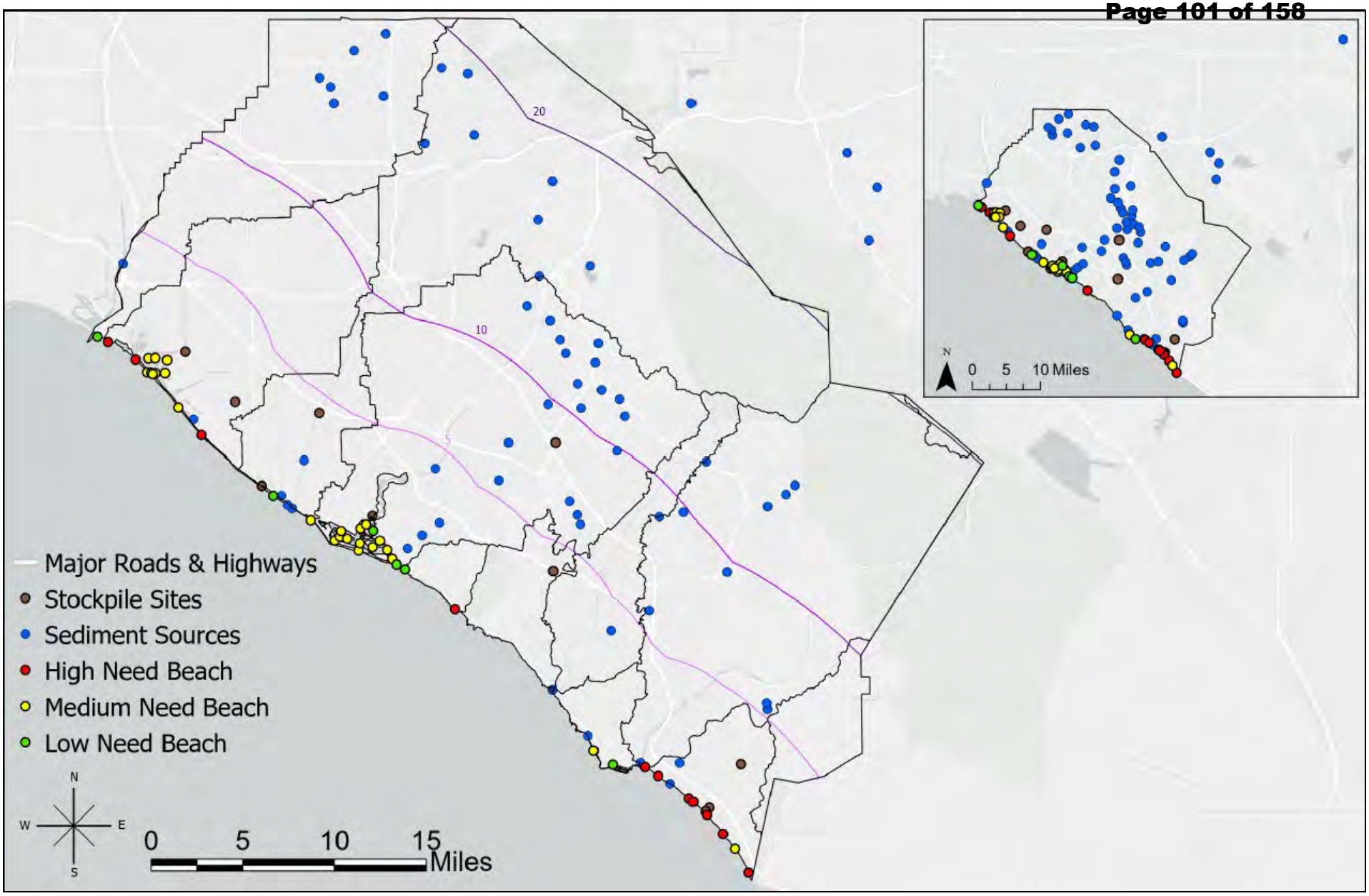

Figure 4-1. Locations of Potential Sediment Source and Stockpile Sites

Information included in Appendix A.1 - *Sand Sources Table* are:

- Owner of sediment source
- Reason for excavation/dredging
- Likelihood to generate beach quality sand
- Volume of sediment availability
- Frequency of sediment availability
- Closest potential receiver beach(es)
- Distance to closest potential receiver beach

Note that there were very few examples of measured sediment grain size/chemistry for most source sites and thus beach compatibility was estimated as either low, medium, or high based on qualitative evidence.

Estimates in Appendix A.1 for sediment availability/frequency were included when available but are sparse overall. Estimates for detention basins were made from allowable excavation values provided in the individual maintenance permits of each applicable basin. Typically, OCPW is allowed to excavate their basins when the volume reaches 25% of the design capacity, therefore availability for each basin is estimated as 1/4 of its design capacity. The bi-annual frequency of availability was estimated based on the specific conditions of some permits which state maintenance is to occur every two years. It is important to note that these are only estimates and the volumes change because of weather conditions; debris basins can reach 25% capacity more than once in a season or not reach 25% capacity for many years.

Estimates in Appendix A.1 for the OC ocean outlets were made from values provided in RGP 46. Estimates for dams/reservoirs were made from values provided in Slagel and Griggs (2006) with the exception of Prado Dam which was provided from correspondence with Orange County Water District (OCWD) staff. Estimates for San Diego Creek and Bolsa Chica Wetlands were made from the permitted allowable excavation volumes. The estimate for Huntington Beach Wetlands was provided by Moffatt & Nichol (2007) and the estimate for the Borrego Wash was provided from correspondence with OCPW staff.

4.1.1 Sediment Detention Basins

Sediment detention basins act to trap sediment and debris that may otherwise travel downstream and cause flood control problems. OCPW periodically cleans out the detention basins, with heavy earthmoving equipment. Normally, the material removed from the basins is used for landfills or sold to contractors. Delivery of basin sediment involves removal of incompatible material such as brush and boulders at the site. Removal of this material may be accomplished through mechanical sifting and reworking of the sediment using conventional earthmoving equipment (See Section 4.2.4). The beach compatible material would then be hauled to the beach via trucks or train. As mentioned, sediment detention basin infilling is sporadic and depends on the precipitation that occurs during any given year.

Of the 71 potential sources provided in Appendix A.1, 14 are sediment detention basins, all of which are generally located 5 to 20 miles from the coastline. Of these 14 basins, 8 are currently

permitted for sediment excavation. These permitted basins, known collectively as the "Foothill Basins" include Agua Chinon, Bee Canyon, East Hicks Canyon, Hicks Canyon, Lower Peters Canyon, Orchard Estates, Round Canyon, and Trabuco. The current permits allow for as-needed excavation of each basin when their respective sediment volume reaches or exceeds 25% of the design capacity for a 10-year period expiring in 2030.

4.1.2 Lakes/Dams/Reservoirs

Many dams and reservoirs within Orange County were included as potential sources in the CRSMP (Everest et. al, 2013) as they are known sediment deposition areas.

While most potential sediment sources outside of Orange County are likely not practical for opportunistic use due to their long distance from the coast, Prado Dam (just outside of the OC border) is important because it is part of the OC coastline watershed, is adjacent to rail lines, and holds a high volume and high frequency of available beach quality sediment. It is estimated that there are millions of cubic yards of sediment currently impounded behind (upstream of) Prado Dam. A 2011 study (OCWD, 2011) cites that, on average, Prado Dam impounds 1.19 million cy of sediment per year.

Typically, OCWD annually excavates roughly 5,000 cubic yards of sandy (~97% sand) material along River Road within the Prado Dam Basin and is typically stockpiled in two locations (see Figure 4-2). This material could be opportunistically used for beach placement but there are no beach receiver sites currently permitted to be able to receive it. In addition to the OCWD maintenance, there is at least one other area within Prado Dam Basin with potential surplus sediment of roughly 25,000 cy annually.



Figure 4-2. OCWD Prado Dam Basin Sediment Stockpiles

4.1.3 Rivers, Creeks, Flood Control Channels

Another potential source of sandy material is from rivers, creeks, channels and storm drains. Historically, large volumes of sediment have been excavated/dredged from major rivers and placed on the beach as nourishment. From 1920 to 2000, roughly 70,000 cubic yards of material from the San Gabriel was placed on East Seal Beach, 6,500,000 cubic yards of sediment from the Santa Ana River was placed on Surfside/Sunset, Huntington, and West Newport beaches, and almost 1,000,000 cubic yards of sediment from the San Juan Creek was placed on Doheny State Beach (Higgins et. al, 2004). More recent events have occurred as well including the dredging/excavation of approximately 650,000 cubic yards of sediment from the Santa Ana River which was placed on West Newport Beach in 2016-17.

Noble (2017) highlights the Lower Santa Ana River, San Diego Creek, and San Juan Creek as significant potential sources moving forward. ("Lower" Santa Ana River is defined as downstream of Prado Dam). Sediment characterization studies by the USACE and the County of Orange have confirmed the good quality of the sediment from the Lower Santa Ana River, making it a prime candidate for future nourishment projects and it has already been used opportunistically on Orange County beaches. Sediment from the San Diego Creek has historically never been used as beach nourishment. While sediment has accumulated in the lower reach of the San Juan Creek, Noble (2017) stated that utilizing this material currently is impractical, as sediment volume is limited and any excavation/removal of sediment from the lower reach of the creek bed would need to address concerns about destabilizing existing levee and flood control structures. However, future channel widening projects of the San Juan Creek and Trabuco Channel (an upland tributary to the San Juan Creek) may provide beach quality sand or gravel for reuse.

Of note is the "Borrego Wash", located in Irvine near the intersection of Alton Parkway and Irvine Boulevard (see the yellow pin in Figure 4-3). The site produces roughly 1,000 cy of material annually. Initial grain size and chemistry testing revealed the material is almost entirely sand (~1% fines) and did not contain any contaminants. It is likely that more reaches like Borrego Wash producing high quality sand will be found in the future.

A list of potential sources was created and is provided in Appendix A.1. Note that the only rivers/creeks/channels/storm drains included are those in which excavation/dredging has previously occurred or have been recommend for inclusion by local sediment source managers.



Figure 4-3. Location of Borrego Wash Source Site

4.1.4 Wetlands/Marshes

Multiple coastal wetlands/marshes exist within Orange County which may periodically require maintenance and therefore be a source of sediment. For example, the Talbert Marsh was designed to include sediment traps which function as catchment basins for suspended sediments that are naturally pulled in and out of the marsh from tidal action and from upcoast freshwater channel deposits (Moffatt & Nichol 2023a). As part of the HB Wetlands Conceptual Restoration Project planning (Moffatt & Nichol 2007), it was estimated that the traps may require clearing roughly every 5-10 years to maintain the appropriate tidal prism necessary to support the inhabitant plant and animal species within the wetlands. Excavation/dredging of the sediment traps at Talbert Marsh are not currently permitted but could be in the future and thus a potential source for OC SCOUP beaches.

Historically, large volumes of sand within Bolsa Chica Wetlands were dredged infrequently, and sporadically. Currently, the Bolsa Chica tidal outlet is dredged approximately every two years to maintain tidal circulation for the wetlands ecosystems. Dredge equipment is stationed within the wetlands area and material is hydraulically piped to the northern end of Huntington Beach Cliffs.

4.1.5 Ocean Outlets

The OCPW Ocean Outlets Maintenance Program consists of routine maintenance of five ocean outlets including Talbert Channel, Santa Ana River, Salt Creek, Estrella Storm Channel, and Segunda Deschecha. For each outlet, typically semiannual maintenance activities include removal of sand deposits from the ends of the outlet structures and placing the removed sand on beach areas adjacent to the outlets. This maintenance is currently under RGP-46 (USACE and Water Board) and a California Coastal Commission (CCC) Coastal Development Permit. A summary table of beach nourishment activity associated with the Ocean Outlets Maintenance Program is provided in the following table. Some cities also maintain ocean outlets.

Table 4-1. Ocean Outlets Maintenance Program Summary

Ocean Outlet	Nourished Beach(es)	Maintenance Events Per year	Approximate Nourishment Volume	Beach Nourishment Area (Acres)
Segunda Deschecha Canada	San Clemente North Beach	0-2	1,000 (per event)	0.20
Estrella Storm Channel	Capistrano Bay District	0-2	500 (per event)	0.12
Salt Creek	Salt Creek Beach	0-2	1,000 (per event)	0.20
Santa Ana River	West Newport Beach, Balboa Beach	Varies	Up to 200,000 (annually)	11.22
Talbert Channel, including sediment trap within channel	Huntington State Beach	Varies	Up to 35,000 (annually)	3.12

4.1.6 Upland Construction

The previously discussed sediment sources are primarily related to maintenance activities. Sediment sources could also arise from the construction of an OCPW or other government entity Capital Improvement Project, as well as from private development. It is impossible to accurately estimate the volume of material that may be available from unforeseen upland development or other projects. However, these sources may become available during the program's life.

4.1.7 Upland Quarries

Quarries located throughout Southern California have been considered as possible sources of sand for beach renourishment. The main challenge when investigating sand mined at quarries is finding beach quality sand within the gradation limits and of similar color. The majority of quarries offer sand used for construction materials, and additional processing may be required to produce a beach quality sand.

An adjustment of quarry operations may be possible if an approximate sand production volume threshold is met. This threshold would be dependent on the approximate annual or bi-annual sales volume, and physical size of the quarry. It is estimated this threshold would be around 100,000 cubic yards annually. Quarries with potential feasibility for nourishing Orange County beaches range in distance from 10 -125 miles from the coast.

4.1.8 Beach Sand

Due to sediment littoral transport along the shoreline, some beach areas grow wider over time, while an adjacent beach becomes narrower. To rectify this condition, the sand on the wider beach is relocated using construction equipment to the narrow beach; this operation is called sand "backpassing." In this sense, the wide beach sand is an opportunistic source for placement on a narrow beach. This backpassing currently occurs at Seal Beach (through permitting separate from OC SCOUP), where sand is periodically moved from West Beach to East Beach. There may be other beaches in Orange County where sand backpassing is appropriate.

Additionally, some beaches grow wider due to upcoast nourishment such that the beach has excess width and thus excess (available) sand. This is a condition which occurs frequently at Huntington Beach State Beach; Figure 3-12 and Figure 3-13 show areas outlined in green where sand may be removed to provide nourishment sand for other beaches under this OC SCOUP.

4.2 CRITERIA FOR SOURCE MATERIAL SUITABILITY

Criteria for beach sand sources are specified herein to enable sediment managers (beach managing entities) to implement projects in accordance with the pertinent guidelines established by Federal and State regulatory agencies. Criteria is established herein for each of the following source sediment characteristics:

1. chemistry
2. grain size
3. color
4. debris / organics / riparian vegetation content
5. compactability/moldability
6. caulerpa (for marine-originated sediment only)

Each source of potential beach sediment will be analyzed against each of these criteria to determine if the source sediment is beach-compatible. This section provides an overview of the suitability criteria. Further detailed information about each criteria and the sediment sampling and analysis to be implemented for each source site are provided in the OC SCOUP Programmatic Sampling and Analysis Plan (PSAP) (Appendix A.2). The draft PSAP will be replaced by the final agency-approved PSAP in the final version of these Implementation Guidelines.

The intent of the PSAP is to have sampling and analysis protocols pre-approved by regulatory agencies for when source sediment opportunities arise, with the exception of the source sediment sampling design. A sampling design (number, location, and depths of samples) will need to be developed and tailored for the specific source site and will be approved by the agencies for each project (each opportunistic event). Regulatory agencies will approve the use of the source sediment for beach placement based on the source site sampling and analysis results and other information provided in the Project Notification Report (described further in Section 9).

4.2.1 Chemistry

Chemical suitability of the source material is required to avoid adverse effects to human and marine ecosystems health. Chemical testing of sediments for beach nourishment typically adheres to the tiered approach established by the Inland Testing Manual (ITM) (USEPA and USACE 1998). Source sediment suitability is determined by comparing chemistry results to: 1) sediment quality guidelines effects range low (ERL) and effects range median (ERM) values developed by Long, et al. (1995) and 2) U.S. EPA Regional Screening Levels.

4.2.2 Grain Size

Analysis of the source sediment grain size and comparison to the beach receiver site sand grain size is necessary for determining suitability of the source material for beach nourishment. Grain size analysis is conducted by collecting samples and performing a sieve analysis. The USACE guidelines to determine the acceptable grain size content are based on matching the gradation of the receiving beach native sediment within a certain percentage of the source material (Moffatt & Nichol, 2001). The proposed OC SCOUP grain size suitability criteria, as described in the Programmatic SAP, is a modified version of the USACE methodology and is intended to simplify the source sediment suitability determination.

Some sediment sources (especially those from ocean outlets or riverine channels) may include natural material (non-debris) such as cobble and seashells. Sampling methods do not typically result in cobble-size particles being in the sediment sample thus it is necessary to define special criteria for cobble-size particles. Source material with a high cobble content will be allowed for placement only on the following beaches, which have natural shoreline composition containing coarse/cobble material:

- Doheny State Beach
- Capistrano Beach County Park
- Poche Beach County Park
- Capistrano Shores
- North Beach, San Clemente
- Cottons/Trestles

Grain size analyses protocols and specific grain size thresholds for each beach receiver site are provided in the Appendix A.2 Programmatic SAP.

Noble (2017) compares the gradation curves of several potential Orange County receiver site beaches and plots these on one graph (Figure 4-4) to create a general range of sediments for the Orange County coastline. When compared amongst receiver sites, the coarsest and finest lines have noticeable variation. However, there is a wide enough overlap between these lines (green section of the figure) in which Noble (2017) concluded, "the composite envelope indicates that beaches between Seal Beach and San Clemente are similar such that the potential exists for one source to fit all locations."

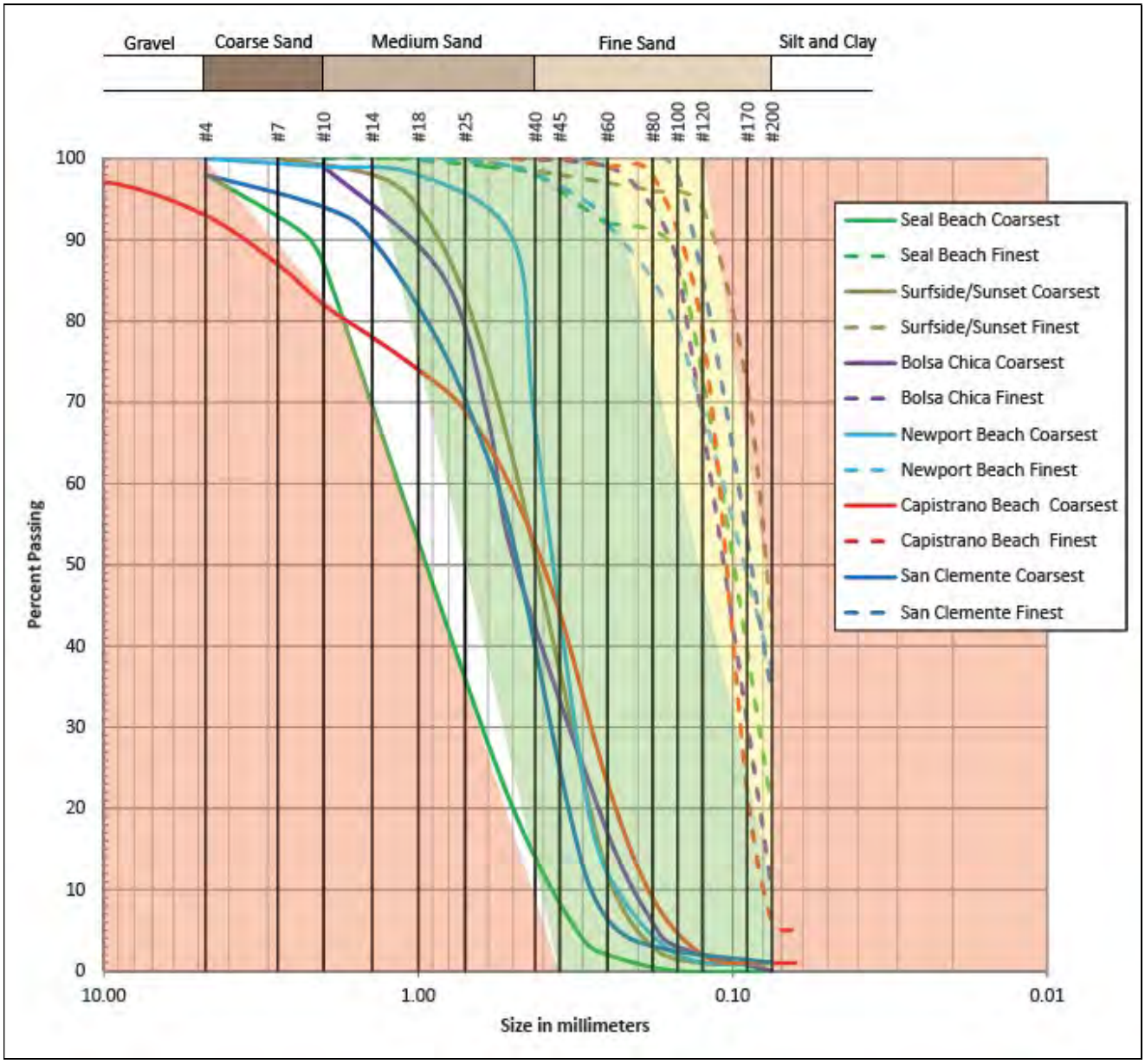

Figure 4-4. Potential Beach Receiver Site Gradation Curves

A novel approach for measuring grain size has been developed called SandSnap (https://sandsnap-erdcchl.hub.arcgis.com/). The U.S. Army Corps of Engineers, James Madison University, and Marda Science, LLC partnered together to create a user-friendly and easily accessible application for collecting and publishing sediment grain size information. SandSnap allows anyone with a cell phone to take an image of sand with a U.S. coin and the SandSnap tool then measures the sand's grain size using a deep learning neural network (Buscombe, 2020; McFall et. all, 2020). The image and grain size distribution information are readily available to the user and public in the SandSnap data viewer.

While not as accurate as a typical sieve analysis, SandSnap could be used as a screening tool to help approximate source sediment percent fine and coarse material for informing decision-making on the suitability of potential source material for beach placement. By simply taking a picture of the source sediment and submitting it online to SandSnap, sediment distribution information including D10, D16, D25, D50, D65, D75, D84, and D90, would be promptly output. The notation DXX refers to the percentage of sand in the sample whose diameter falls below the specified value. For example, a sample D25 value of 0.06 mm indicates 25% of the particles in the sample have a diameter less than 0.06 mm. In this way, the percentage fines can be approximated by finding the two groups in which the determinant value for fine-grained material (0.074 mm) falls between. For example, if the D10 value is equal to 0.07 mm and the D16 value is equal to 0.08 mm, then the sediment could have a percent fines value between 10%-16%.

4.2.3 Color

There is less concern about material color than in the past, because of the need for more beneficial use of dredged material. Dredged material typically is initially a darker color than the receiving beach, then is washed and reworked by waves and eventually "bleaches out" under exposure to the sun and marine environment, resulting in sand very similar in appearance to the receiving beach. The USACE Shore Protection Manual (USACE 1984) states that "...fill material darkened by organic material (Surfside/Sunset Beach, California) or "reddened" by oxidized clay minerals (Imperial Beach, California) will be bleached quickly by the sun to achieve a more natural beach color." Agencies have informally indicated that the only criteria for color is to reasonably match the color of the receiving beach after reworking by waves for aesthetic reasons (Moffatt & Nichol, 2001). Accordingly, color compatibility will be at the discretion of the receiver beach managing entity (e.g., City).

4.2.4 Debris / Organic / Riparian Vegetation Content

Source sand must be free of trash, debris, and significant amounts of organic material when placed on the beach receiver sites. The source material should not contain debris/trash because of possible health and safety hazards posed by such materials and the possible nuisance odors and visual impacts associated with their presence. It is assumed that any riparian vegetation remnants or seedlings in the source sediment would not survive once the material is placed in the marine environment, however, there may be a concern that the riparian vegetation could be invasive in adjacent upland areas. Accordingly, if the source site has the potential to include invasive vegetation seedlings, the placed source material and adjacent upland areas will be monitored and invasive vegetation will be removed/treated accordingly if it becomes present.

4.2.5 Compactability/Moldability



Certain types of sediment, (e.g., material with high content of clay, iron oxides and calcium carbonate), may form a hardpan when exposed to a wetting and drying environment. An example of hardpan-type material is in the photo to the right. This compactability property is not acceptable for beach fill if the material is placed high on the subaerial beach. This criteria is further described in the Programmatic SAP (Appendix A.2).

4.2.6 Caulerpa Content

The genus Caulerpa comprises a group of green algae with a great invasive potential. In March 2021, *C. prolifera*, (a species of Caulerpa) was discovered in Newport Bay. As a result of this outbreak, source sediments from the Newport Bay marine environment will need to adhere to the guidelines set forth in the Caulerpa Control Protocol (NMFS, 2021) prior to placement on beaches and as further described in the Programmatic SAP (Appendix A.2).

4.3 TRANSPORTATION METHODS

Beach fill activities may occur on short notice and when material becomes available. Transportation of the sediment will be by trucks, train, hydraulic pipeline, and/or conveyor belt. Trucking to/from all receiver sites will be assumed; some sites will also have the ability to receive sand via train (Doheny State Beach, Capistrano Beach County Park, Poche Beach, Capistrano Shores Beach, North Beach, San Clemente Central City Beaches, San Clemente State Beach, and Cyprus Shore/Cottons beach), hydraulic pipeline (Huntington Beach Bluffs), or conveyor belt (San Clemente State Beach, Crystal Cove State Beach).

4.3.1 Trucking

Trucking of suitable beach sand from potential sand sources will probably be the most efficient transportation method for most sand source sites. The majority of the sediment detention basins, lakes, and dams/reservoirs are located a sufficient distance to the beach fill sites that trucking would be the only feasible option. Other potential sources that may require trucking to transport the material to the beach include upland construction projects.

If trucks are used to transport sand, a typical scenario may include the following: Trucks would haul material from the sand source site (debris basin, construction site, etc.) along a designated route to the placement sites. Temporary construction access routes may have to be created on the beach to enable trucks to move onto the beach without getting stuck in the sand. Sand will be redistributed along the beach using earthmoving equipment such as bulldozers and scrapers. Trucks will generate added traffic and noise along the haul route and may cause residents a temporary inconvenience during sand delivery. Noise levels may be temporarily increased during construction from heavy equipment hauling and spreading material. All operations will follow local noise ordinances and hours of operation are specified in the ordinances.

4.3.2 Train

In certain situations and in particular for beaches in southern Orange County, transportation of upland material to the beach may be more efficient by rail. Significantly higher quantities of material can be transported in a single trip when compared to trucking, and thus this method could be more time and cost efficient when source material is located extremely far upland and/or close to a rail line. A typical aggregate railcar can transport 60 cy (100 tons) of material. Thus, a 100-railcar train could haul 5,500-6,000 cy of sand, which compares to approximately 350-500 haul trucks. A railcar unloading method has not yet been determined but would likely be sidecar-dumping directly onto the beach or conveyed from the railcar by a belt system. Scrapers and/or loaders would then transport the material to the sand placement site.

As shown in **Figure 4-5**, rail line runs adjacent to the coastline in southern Orange County (Dana Point Harbor to Cottons) and near one of the El Toro Marine Corps Air Station stockpile site and near the Prado Dam Basin (potential sand source site).

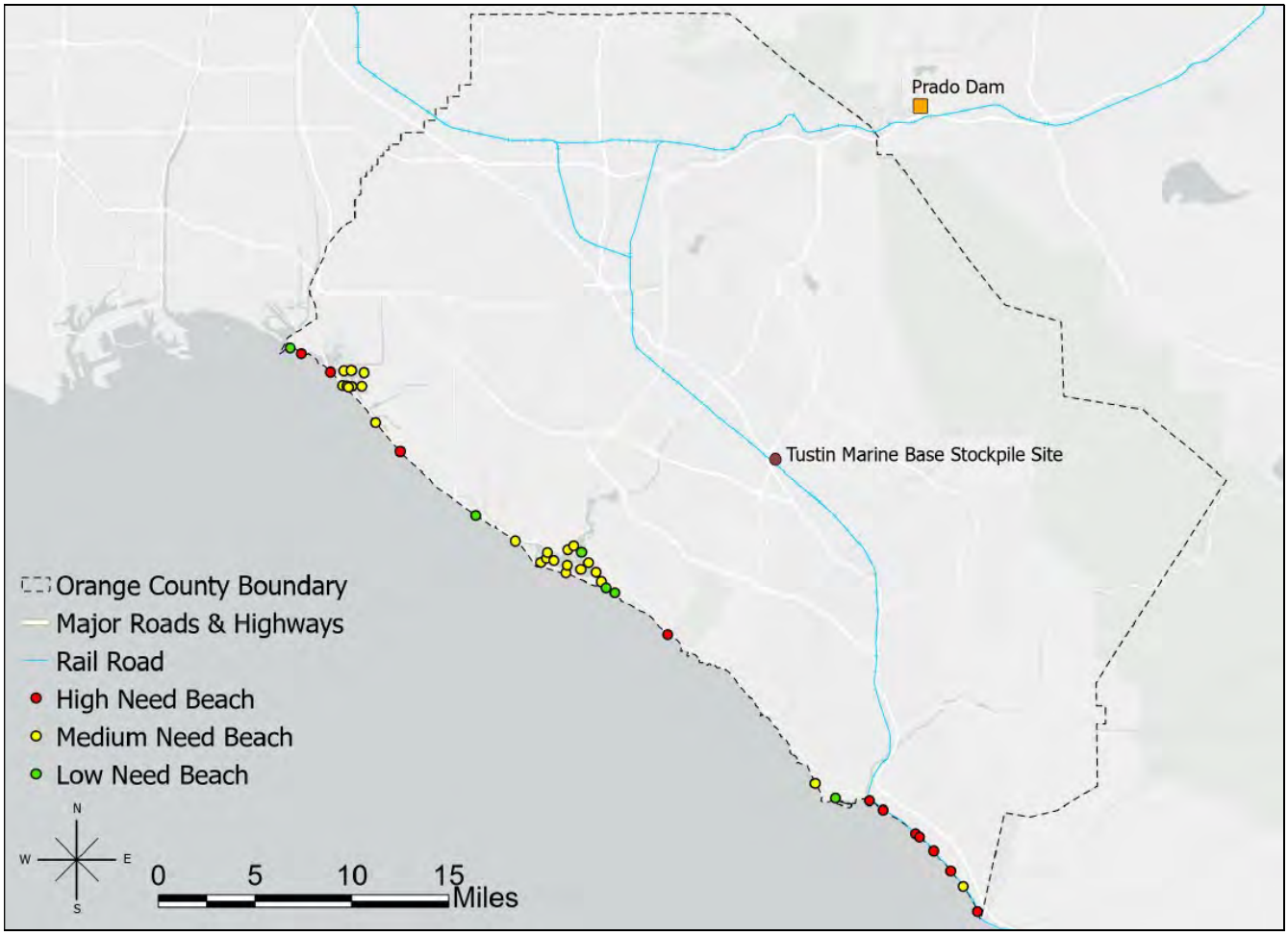

Figure 4-5. Railway Lines (Blue) within Orange County

The Orange County Transit Authority (OCTA) manages the section of the LOSSAN corridor within Orange County. OCTA has indicated that, currently, there are significant constraints to be able to use rail for sand transport to receiver beaches in southern Orange County, including the

likely need for siding track to allow for passenger and freight train passing while sand unloading is occurring. There is not adequate space within the railroad right-of-way along San Clemente coastline for the siding track needed.

In 1997, the City of Seal Beach completed a nourishment-by-rail project (GHD, 2021). The project utilized both the Union Pacific railroad tracks as well as rail lines maintained by the Navy within Naval Weapons Station Seal Beach. Recent observations indicate the Naval Weapons Station tracks may require significant maintenance to be operational and so it is unclear if rail transport of sand for the Seal Beach area is currently viable.

Transportation logistics could also be accomplished by subcontracting with a "rail-solution" company, such as Coast Rail Services or Herzog Rail and Construction Solutions. Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) are the leading railroad services and transportation companies, which can also offer freight transportation solutions. They have been utilized for previous beach nourishment projects that utilized rail (including the aforementioned Seal Beach project) and could aid in coordinating the following necessary logistical tasks:

- Reserving rail time
- Leasing railcars
- Coordinating transportation of railcars to and from the sand source

Although sand transportation by rail is not currently feasible, it is included herein for when/if rail infrastructure or operational changes are made such that sand transport to OC SCOUP receiver beaches can be done.

4.3.2.1 Hydraulic Pipeline

Some beach receiver sites are located adjacent to or near locations with ongoing maintenance dredging. These locations include ocean outlets, wetlands/estuaries, and harbors. For locations with hydraulic cutter head/suction dredging, the sand from the dredging source site could be transported to the beach receiver site via hydraulic pipeline. This type of sediment placement was used in the past for placing material dredged from Dana Point Harbor onto Capistrano Beach. Although hydraulic pipeline sand placement is not typical for opportunistic projects, it is being included herein should this opportunity arise. As discussed above, it is a currently identified opportunity for the Huntington Beach Bluffs receiver site using dredge material from the Bolsa Chica Tidal Inlet maintenance.

5.0 POTENTIAL STOCKPILE SITES

Stockpile sites will be important for the success of the OC SCOUP program as most upland sources yield limited quantities of beach quality material and the opportunity timing may not align with the beach receiver site environmental and recreational windows. Often times, the timing of activities at source locations does not align with the allowable nourishment window (September to March) as most flood facility maintenance cannot occur during the rainy season, which typically spans from December to February. Thus, decision makers must choose between project delays or abandoning the use of beach quality material as nourishment. City officials in charge of managing SCOUP permits in San Diego County have voiced their frustration with project timing adding difficulties to utilizing the SCOUP program in the past.

Having available stockpile sites to store source material (ideally in central locations between source and receiver sites) provides flexibility for both timing and increasing the quantity of source material over time to generate an economically feasible volume. Stockpile sites can be utilized once a large enough amount of material is accumulated, and a need presents itself. Additionally, storing sediment at stockpile sites allows for easier access and coordination with receiver beach agencies.

Potential stockpile sites have been identified within the program area, as shown previously in Figure 3-2 and Figure 3-3, and are discussed in further detail below.

5.1.1 OCPW Stockpile Locations

C02/C04 Flood Channels Confluence (Bolsa Chica & Edinger)

The stockpile site is located at the confluence of the C02 and C04 flood control channels, in northern Orange County (within City of Huntington Beach) at the corner of Bolsa Chica Street and Edinger Avenue (**Figure 5-1**).

The site has two segments. The first, roughly triangular site is bordered by the flood channels to the north, west and south, and Bolsa Chica St. to the east. Current items being stored at this site include rock riprap, sandbags, fencing, barricades, traffic cones and stop signs. The long and narrow second site is a maintenance dirt road. It runs parallel to and is bordered by Edinger Avenue on its southern side and a stream to its northern side. Combined, the two sites span an area of roughly 23,000 square yards (4.8 acres).

Historically, the triangular site that borders Edinger Avenue and Bolsa Chica Street has been utilized more for storage than the dirt road. However, it is likely the dirt road will be utilized more in the future as there have been previous noise complaints at the triangular site from homeowners to the east of Bolsa Chica Street as a result of construction vehicles depositing material into the site. These past complaints arose from the deposition of larger, bulkier items such as rock riprap, which generates significantly more noise than sand. Therefore, the first triangular site should still be considered as an option for this program.

The site's relative proximity to the coast, large available storage area, and latitudinal location makes it a perfect candidate to nourish north county receiver beaches such as East Seal Beach (6

miles away), Surfside/Sunset Beach (4 miles), and Huntington Beach Bluffs (6 mile). The adjacency to Bolsa Chica Street provides an easy access point for truck haul.

In order to avoid impacts to open water and salt marsh habitats in the adjacent Bolsa Chica / Westminster Channel (Merkel, 2025b), a buffer large enough to install, maintain, and inspect stockpile BMPs should be left between any stockpiled soil and the upper edge of the adjacent cement channel. The triangular portion of this site should be used for stockpile storage of sediment with greater than 35% fines if stored over wet season.

D03 D/S California @ E01 Bike Trail

The D03 D/S California @ E01 Bike Trail stockpile site (**Figure 5-2**) is an existing empty lot located just south of the 405 freeway, bordered to the west by the Santa Ana River ("E01") bike trail and to the east by the Greenville-Banning flood channel ("D03"), within the City of Costa Mesa. It is 4 miles upstream of the Santa Ana River ocean outlet. The site is accessible by a gated access road, controlled by OCPW, off of California Street. The available stockpile capacity is very limited with a surface area of roughly 1,000 square yards (0.2 acres). Current items being stored at this site include sandbags, fencing, barricades, traffic cones and stop signs.

The site's relative proximity to the coast, and latitudinal location makes it a suitable storage location for nourishments at north county receiver beaches such as Huntington Beach Bluffs (7 miles away) and West Newport Beach (7 miles).

In order to avoid impacts to biological resources in the cement lined channel adjacent to this site to the southeast (Merkel 2025b), a buffer large enough to install, maintain, and inspect stockpile BMPs should be left between any stockpiled soil and upper edge of the adjacent cement river channel.

Former El Toro Marine Corps Air Station (now "Great Park")

This potential stockpile site (**Figure 5-3**) is a large plot of undeveloped land owned by OCPW, located in the City of Irvine, within the former El Toro Marine Corps Air Station (MCAS). The site is bordered by Marine Way to the north, an Orange County Transit Authority (OCTA) yard to the south, and other undeveloped plots of land to the south and east. The site has the most storage availability of any of the identified stockpile sites, with a surface area of roughly 47,500 square yards (9.8 acres). Additionally, the site is located in a fairly unpopulated area, relatively distant from residential properties and not near any major streams, storm channels, or other environmental areas. A significant pro of this site is the adjacency to the rail line, which opens the possibility of utilizing train transport of sand from this site to the beaches.

Audubon Basin, I02B01

The Audubon Basin, "I02B01" site (**Figure 5-4**) is a stormwater detention basin maintained by OCPW. It is located directly southeast of the CA Highway 73 at the intersection with El Toro Road within the City of Aliso Viejo. Storage is available directly south and east of the basin along a dirt access road. The site has moderately available storage area with a surface area of roughly 5,500 square yards (1.1 acres). Current items being stored at this site include sandbags and rock.

The site's relative proximity to the coast, and latitudinal location makes it a suitable storage location for nourishments at south county receiver beaches such as Doheny and Capistrano Beaches (10 miles away). Additionally, the site is located in a fairly unpopulated area, relatively distant from residential properties.

In order to avoid impacts to paniculate tarplant, a sensitive species (Merkel, 2025b), a survey should be performed by a qualified biologist prior to any storage event and, if found, any paniculate tarplant should be fenced off with ribbon or yellow rope and t-posts. In order to avoid impacts to adjacent native habitats and/or downstream aquatic jurisdictional resources, a buffer large enough to install, maintain, and inspect stockpile BMPs should be left between any stockpiled soil and the upper edge of the adjacent detention basin to the north, overflow channel located in the western portion of site that crosses the site and drains to native riparian habitat, and the brow ditch along the southern perimeter that drains to native riparian habitat.



Figure 5-1. OCPW Bolsa Chica Street and Edinger Street Potential Stockpile Site



Figure 5-2 OCPW D03 D/S California @ E01 Bike Trail Potential Stockpile Site



Figure 5-3. OCPW El Toro MCAS / Great Park Potential Stockpile Site



Figure 5-4. OCPW Audubon Basin Potential Stockpile Site

5.1.2 Other Potential Stockpile Locations

In addition to sites owned/maintained by OCPW, further investigation was made to identify other potential stockpile sites outside of OCPW jurisdiction. From this investigation, several additional sites were identified and are discussed below. The use of these stockpile sites for OC SCOUP is at the discretion of the site owner; these sites may or may not ultimately be used for OC SCOUP, but are included herein for environmental review compliance and regulatory approval for future potential use.

San Clemente – North Beach

This site is located between El Camino Real and Calle Deshecha near Avenido Pico (**Figure 5-5**) and is owned by the City of San Clemente. It is relatively small (1,800 square yards) but is close to sand receiving beaches, e.g., North Beach and Capistrano Shores.

San Clemente Water Reclamation Plant Yard

As part of a previous City of San Clemente opportunistic beach program, the USACE Regional General Permit (RGP) 66 included utilization of a stockpile site along Avenido Pico between El Camino Real and Avenida Vista Hermosa (**Figure 5-6**). The site is a maintenance yard within the City of San Clemente Water Reclamation Plant. The site has moderately available storage area with a surface area of roughly 3,200 square yards.

San Clemente – Avenido Vista Hermosa and La Plata

This potential stockpile site (**Figure 5-7**) is an empty lot at the southwest corner of Avenido Vista Hermosa and La Plata and is owned by the City of San Clemente. It has a surface area of roughly 9,100 square yards. A key advantage of this site is its proximity to main transit ways.

City of Huntington Beach Gothard Street Site

This potential stockpile site (**Figure 5-8**) is a fenced area owned by the City of Huntington Beach and currently used by the City for staging and stockpiling for its Capital Improvement Project . It has a surface area of roughly 4,500 square yards (0.9 acres). A key advantage of this site is its proximity to main transit ways.

Huntington Beach State Beach Parking Lot

As discussed previously and as shown in Figure 3-12 and Figure 3-13, the backbeach area along Huntington Beach State Beach will also be considered as a sand source site. The available sand would be stockpiled within the parking lot, for potential use at other beach receiver sites.

Newport Beach North Star Beach Parking Lot

This potential stockpile site (**Figure 5-9**) is a fenced hard-packed sand/dirt lot owned by the City of Newport Beach and used primarily for vehicular parking for the Newport Aquatic Center and North Star Beach. It is along the Upper Newport Bay shoreline and has a surface area of roughly 12,500 square yards (2.5 acres).



Figure 5-5. City of San Clemente North Beach Potential Stockpile Site



Figure 5-6. City of San Clemente Potential Stockpile Site at Water Reclamation Plant Yard



Figure 5-7. City of San Clemente Potential Stockpile Site at Avenido Vista Hermosa and La Plata

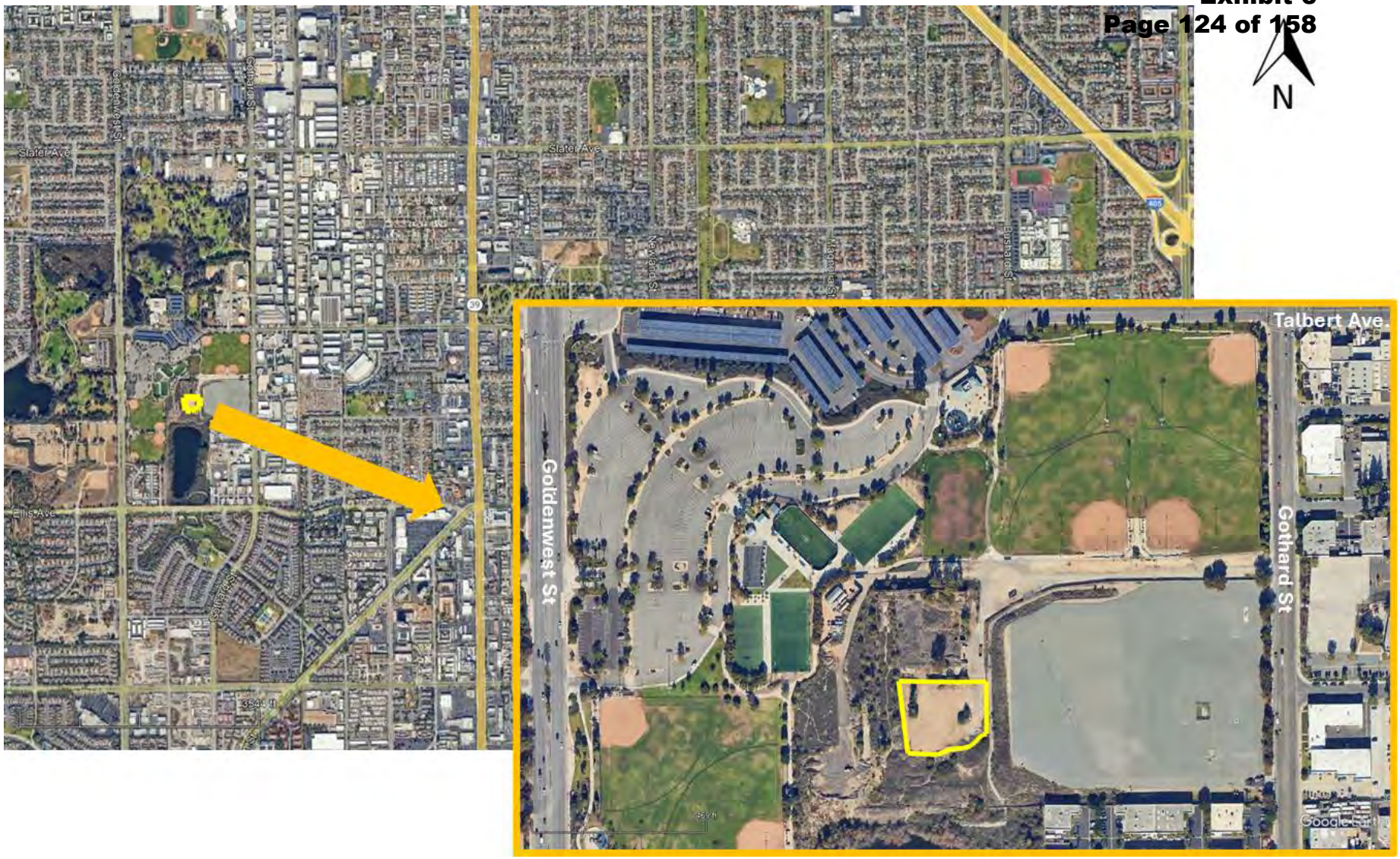

Figure 5-8. City of Huntington Beach Gothard Street Potential Stockpile Site


N
Polaris Dr
N Star Ln
Saratoga
Lido Isle
Lido Isle Dr
Lido Isle Dr E
Lido Isle Dr W
Bayside Dr
Bayside Dr E
Bayside Dr W
Dover Dr
Westcliff Dr
Nottingham Rd
Cabrillo Park Dr
Cabrillo Park Dr E
Cabrillo Park Dr W
Galaxy Dr
Jamboree Rd
Santiago Dr
Santiago Dr E
Santiago Dr W
Polaris Dr
Polaris Dr E
Polaris Dr W
Persian Dr
Highland Dr
Sonora Dr
Seaport Dr
Seaport Dr E
Seaport Dr W
Sea Horse Dr
Sea Horse Dr E
Sea Horse Dr W
Sea Horse Dr S
Sea Horse Dr S E
Sea Horse Dr S W
Sea Horse Dr N
Sea Horse Dr N E
Sea Horse Dr N W
Sea Horse Dr N E
Sea Horse Dr N W
Sea Horse Dr S E
Sea Horse Dr S

5.1.3 Summary

The potential stockpile sites, which were discussed above, are summarized in Table 5-1.

Table 5-1. Potential Stockpile Sites

Closest Placement Sites	Stockpile Site	Approximate Lot Size (1) (acres)	Approximate Stockpile Volume Capacity (2) (cubic yards)
North Beaches	C02/C04 Confluence (Bolsa Chica & Edinger)	4.8	77,000
North Beaches	D03 D/S California @ E01 Bike Trail	0.2	3,000
South Beaches	Audubon Basin, I02B01	1.1	18,000
South Beaches	El Toro MCAS / Great Park	9.8	60,000
South Beaches	San Clemente North Beach	0.4	6,000
South Beaches	San Clemente Water Reclamation Plant Yard	0.7	10,000
South Beaches	San Clemente Avenido Vista Hermosa and La Plata	1.9	30,000
North Beaches	Huntington Beach Gothard Street	0.9	15,000
North Beaches	Huntington Beach State Beach parking lot	1.0	15,000
North Beaches	Newport Beach North Star Beach	2.5	40,000

(1) Lot size is the approximate area available for stockpile of material.

(2) Approximate volume is calculated assuming a 10-ft high stockpile within the area delineated.

6.0 BEACH RECEIVER SITE MONITORING

This section provides a monitoring framework for implementation of specific sand placement events. The framework specifies monitoring criteria "triggers" based on sand placement volume, location, and presence of sensitive biological resources and surfing conditions.

Table 6-1 provides a complete list of the proposed biological and physical monitoring at each of the potential beach receiving sites based on presence of existing sensitive biological resources at each site, as defined in Merkel, 2025a, surfing conditions as defined in Section 3, and proximity to coastal marshes tidal inlets. Cultural Resources monitoring will be implemented for all projects. Maps of the existing biological resources at each beach receiver site are provided in Appendix A.3.

As cited in Table 6-1, some monitoring is based on the season in which sand placement occurs. The seasonal triggers, by month, for each beach receiver site are provided in Table 6-2. Generally, monitoring is required: a) during March through September for receiving beaches with the potential for Western snowy plover and California least terns nesting (Bolsa Chica State Beach and Huntington Beach State Beach), b) during October through February for receiving beaches with the potential for snowy plover overwintering (West Beach-Seal Beach, East Beach-Seal Beach, Surfside Beach, Sunset Beach, Bolsa Chica State Beach, Huntington Beach Bluffs, Huntington State Beach, West Newport Beach, Balboa Beach, Crystal Cove State Beach, Salt Creek State Beach, Doheny State Beach, Cyprus Shore/Cottons Beach), and c) during March through August for all beaches (except the harbor beaches) for grunion spawning when sand placement extends seaward of the MHTL.

Note: adaptive management measures, such as reducing sand placement rate below MHTL or sand placement only during low tides, may be proposed in the Project Notification Report for a specific event to avoid/minimize monitoring in the interest of cost and/or schedule. Any such variance from the monitoring described in this section will require regulatory agency approval as part of the project notification process.

Table 6-1. Proposed Monitoring Requirements

		Biological Monitoring**							Physical Monitoring**			
Beach Receiver Site Name	**Per Event Volume* (cy)**	**Grunion**	**Calif Least Tern**	**Western Snowy Plover**	**Rocky Reef*** **	**Surfgrass**	**Eelgrass**	**Kelp**	**Turbidity**	**Surfing Conditions**	**Beach Profiles**	**Tidal Inlet**
West Beach, Seal Beach	≤25K	N	N	S	N	N	N	N	N	N	N	N
	25K-75K	N	N	S	N	N	N	N	N	N	N	N
	>75K	N	N	S	N	N	N	N	N	N	N	N
East Beach, Seal Beach	≤25K	S	N	S	N	N	N	N	N	N	N	N
	25K-75K	S	N	S	N	N	N	N	Y	N	N	N
	>75K	S	N	S	N	N	N	N	Y	Y	Y	N
Surfside Beach	≤25K	S	N	S	N	N	N	N	N	N	N	N
	25K-75K	S	N	S	N	N	N	N	Y	N	N	N
	>75K	S	N	S	N	N	N	N	Y	Y	Y	N
Sunset Beach	≤25K	S	N	S	N	N	N	N	N	N	N	N
	25K-75K	S	N	S	N	N	N	N	Y	N	N	N
	>75K	S	N	S	N	N	N	N	Y	Y	Y	N
Huntington Harbour Beaches	≤25K	N	N	N	N	N	Y	N	N	N	N	N
	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bolsa Chica State Beach	≤25K	S	N	S	N	N	N	N	N	N	N	Y
	25K-75K	S	N	S	N	N	N	N	Y	N	N	Y
	>75K	S	N	S	N	N	N	N	Y	Y	Y	Y
Huntington Beach Bluffs	≤25K	S	N	S	N	N	N	N	N	N	N	N
	25K-75K	S	N	S	N	N	N	N	Y	N	N	Y
	>75K	S	N	S	N	N	N	N	Y	Y	Y	Y
Huntington State Beach	≤25K	S	S	S	N	N	N	N	N	N	N	Y
	25K-75K	S	S	S	N	N	N	N	Y	N	N	Y
	>75K	S	S	S	N	N	N	N	Y	Y	Y	Y

		Biological Monitoring**							Physical Monitoring**			
Beach Receiver Site Name	**Per Event Volume* (cy)**	**Grunion**	**Calif Least Tern**	**Western Snowy Plover**	**Rocky Reef*****	**Surfgrass**	**Eelgrass**	**Kelp**	**Turbidity**	**Surfing Conditions**	**Beach Profiles**	**Tidal Inlet**
West Newport Beach	≤25K	S	N	S	N	N	N	N	N	N	N	Y
	25K-75K	S	N	S	N	N	N	N	Y	N	N	Y
	>75K	S	N	S	Y	N	N	N	Y	Y	Y	Y
Balboa Beach	≤25K	S	N	S	N	N	N	N	N	N	N	N
	25K-75K	S	N	S	N	N	N	N	Y	N	N	N
	>75K	S	N	S	Y	N	N	N	Y	Y	Y	N
Newport Harbor Beaches	≤25K	N	N	N	N	N	Y	N	N	N	N	N
	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Newport Dunes	≤25K	N	N	N	N	N	Y	N	N	N	N	N
	25K-75K	N	N	N	N	N	Y	N	Y	N	N	N
	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Corona Del Mar State Beach	≤25K	S	N	N	Y	Y	N	N	N	N	N	N
	25K-75K	S	N	N	Y	Y	N	N	Y	N	N	N
	>75K	S	N	N	Y	Y	N	Y	Y	Y	Y	N
Little Corona Del Mar	≤25K	S	N	N	Y	Y	N	N	N	N	N	N
	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crystal Cove State Beach	≤25K	S	N	S	Y	Y	N	Y	N	N	N	N
	25K-75K	S	N	S	Y	Y	N	Y	Y	N	N	N
	>75K	S	N	S	Y	Y	N	Y	Y	Y	Y	N
Salt Creek Beach	≤25K	S	N	S	N	N	N	N	N	N	N	N
	25K-75K	S	N	S	Y	Y	N	Y	Y	N	N	N
	>75K	S	N	S	Y	Y	N	Y	Y	Y	Y	N
Baby Beach, Dana Point Harbor	≤25K	N	N	N	N	N	Y	N	N	N	N	N
	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

		Biological Monitoring**							Physical Monitoring**			
Beach Receiver Site Name	**Per Event Volume* (cy)**	**Grunion**	**Calif Least Tern**	**Western Snowy Plover**	**Rocky Reef*** **	**Surfgrass**	**Eelgrass**	**Kelp**	**Turbidity**	**Surfing Conditions**	**Beach Profiles**	**Tidal Inlet**
Doheny State Beach	≤25K	S	N	S	Y	N	N	N	N	N	N	N
	25K-75K	S	N	S	Y	N	N	N	Y	N	N	N
	>75K	S	N	S	Y	N	N	Y	Y	Y	Y	N
Capistrano Beach County Park	≤25K	S	N	N	N	N	N	N	N	N	N	N
	25K-75K	S	N	N	N	N	N	N	Y	N	N	N
	>75K	S	N	N	Y	N	N	Y	Y	Y	Y	N
Poche Beach	≤25K	S	N	N	N	N	N	N	N	N	N	N
	25K-75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	>75K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Capistrano Shores	≤25K	S	N	N	N	N	N	N	N	N	N	N
	25K-75K	S	N	N	N	N	N	N	Y	N	N	N
	>75K	S	N	N	Y	N	N	Y	Y	Y	Y	N
San Clemente North Beach	≤25K	S	N	N	N	N	N	N	N	N	N	N
	25K-75K	S	N	N	N	N	N	N	Y	N	N	N
	>75K	S	N	N	Y	N	N	Y	Y	Y	Y	N
San Clemente Central City Beaches	≤25K	S	N	N	N	N	N	N	N	N	N	N
	25K-75K	S	N	N	Y	Y	N	N	Y	N	N	N
	>75K	S	N	N	Y	Y	N	Y	Y	Y	Y	N
San Clemente State Beach	≤25K	S	N	N	N	N	N	N	N	N	N	N
	25K-75K	S	N	N	N	N	N	N	Y	N	N	N
	>75K	S	N	N	Y	N	N	Y	Y	Y	Y	N
Cyprus Shore/ Cottons	≤25K	S	N	S	Y	N	N	N	N	N	N	N
	25K-75K	S	N	S	Y	N	N	N	Y	N	N	N
	>75K	S	N	S	Y	N	N	Y	Y	Y	Y	N

Beach Receiver Site Name	Per Event Volume* (cy)	Biological Monitoring**							Physical Monitoring**			
		Grunion	Calif Least Tern	Western Snowy Plover	Rocky Reef***	Surfgrass	Eelgrass	Kelp	Turbidity	Surfing Conditions	Beach Profiles	Tidal Inlet

Y	Monitoring Potentially Required**
N	Monitoring Not Required
S	Monitoring Requirement Dependent on Seasonality of Project

Cultural Resources Mitigation Measures will be implemented for all events.

* The "per event volume" trigger is defined as the maximum sand placed within a rolling year span; if a second/additional event occurs within a year span, then the "per event volume" trigger for the second/additional event would be the cumulative total volume of sand placed for all events within the rolling year span.

** The monitoring specified in this table identifies the potential need for monitoring based on the presence of resources in the vicinity of the maximum potential fill extent footprint. A specific sand placement event may or may not trigger monitoring depending upon the exact location of the event's sand placement within the maximum fill extent footprint. See following sections for specific triggers for monitoring.

*** "Reef" does not include manmade structures such as rock jetties.

Table 6-2. Grunion (G), Least Tern (T), and/or Snowy Plover (P) Monitoring Required Based on Timing of Sand Placement

Beach Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept*	Oct	Nov	Dec
West Beach, Seal Beach	Y-P	Y-P	N	N	N	N	N	N	N	Y-P	Y-P	Y-P
East Beach, Seal Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Surfside Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Sunset Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Huntington Harbour Beaches	N	N	N	N	N	N	N	N	N	N	N	N
Bolsa Chica State Beach	Y-P	Y-P	Y-G,P	Y-G,P	Y-G,P	Y-G,P	Y-G,P	Y-G,P	Y-P	Y-P	Y-P	Y-P
Huntington Beach Bluffs	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Huntington Beach State Beach	Y-P	Y-P	Y-G,P	Y-G,T,P	Y-G,T,P	Y-G,T,P	Y-G,T,P	Y-G,T,P	Y-T,P	Y-P	Y-P	Y-P
West Newport Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Balboa Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Newport Harbor Beaches	N	N	N	N	N	N	N	N	N	N	N	N
Newport Dunes	N	N	N	N	N	N	N	N	N	N	N	N
Corona Del Mar State Beach	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
Little Corona Del Mar State Beach	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
Crystal Cove State Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Salt Creek Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Baby Beach	N	N	N	N	N	N	N	N	N	N	N	N
Doheny State Beach	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P
Capistrano Beach County Park	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
Poche Beach	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
Capistrano Shores	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
San Clemente North Beach	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
San Clemente Central City Beaches	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
San Clemente State Beach	N	N	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	N	N	N
Cyprus Shore/Cottons	Y-P	Y-P	Y-G	Y-G	Y-G	Y-G	Y-G	Y-G	N	Y-P	Y-P	Y-P

Y	Monitoring Potentially Required
N	Monitoring Not Required

** through September 15th for Least Terns and through September 30th for Snowy Plovers.*

6.1 GRUNION MONITORING

Grunion typically spawn at or above approximately mean high tide line on open ocean beaches from March 1st to August 30th during middle-of-the-night spring high tides. The eggs incubate then hatch after approximately two weeks, when the juvenile fish return to the sea during the subsequent spring high tide. Grunion use sandy beaches for spawning, and thus beaches comprised mostly of cobble or with little to no dry beach during high tides, would likely not host grunion activity.

The following is in compliance with Program Guideline Measure (PGM) BIO-3 from the OC SCOUP Initial Study/Mitigated Negative Declaration (IS/MND) (County of Orange, May 2026).

6.1.1 Grunion Monitoring Trigger Criteria

Grunion monitoring will be required for sand placement seaward of the semilunar highest high tide, regardless of volume, which occurs during the grunion spawning season. The spawning season is generally from March 1st to August 30th, but for the purposes of monitoring trigger criteria, is as defined per the California Department of Fish & Wildlife (CDFW) published grunion spawning schedule for the year of the placement event. Table 6-1 identifies the potential receiver site beaches where grunion activity has historically and/or could potentially occur (all potential receiver beaches except for those within the harbors). (Merkel, 2025a).

6.1.2 Grunion Monitoring Protocol

Based on the trigger criteria and as shown in Table 6-3, pre-project surveys (within 30 days to 14 days prior to construction) will be conducted to determine the suitability of that site for grunion spawning. A qualified monitor will be present every night of the forecasted grunion run for three hours, commencing before predicted runs and extending to after the end of predicted runs.

Table 6-3. Grunion Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
March 1 to August 30 (typically)	Survey to occur for all runs which could occur within 14 days of sand placement.	Surveys to occur for all grunion runs during sand placement.	N/A

If the sand placement area is determined to be unsuitable for grunion, CDFW and other resource agencies will be notified. The data that supports the justification will be provided to the agencies including the date of the pre-construction survey and a description of the physical conditions at the beach area. At these sites, no further monitoring for grunion will be required.

If the sand placement area appears suitable for grunion spawning, a qualified monitor will be present every night of the forecasted run. If grunion are not present during predicted runs, no further monitoring will occur. If grunion are present during predicted runs, monitoring will continue throughout sand placement activities until no more grunion spawning activity is observed or the project concludes.

If grunion are present, the course of action will be determined based on the magnitude and extent of spawning events, as defined by the Walker Scale (**Figure 6-1**). The Walker Scale was developed as a way to quantitatively classify the location, intensity, extent, and duration of grunion spawning events. The Walker Scale goes from W-0, representing few or no fish and no spawning, to W-5, representing thousands of fish spawning along the entire length of the beach in a peak that lasts over an hour. If grunion are observed prior to sand placement, the location of spawning activity and a Walker Scale estimate of the density of spawning will be recorded.

Scale	Numbers of grunion	Duration	Descriptor
W-0	No fish or only a few individuals, little or no spawning, fish do not remain on beach	< 1 h	Not a run
W-1	10–100 fish scattered on beach at a time, moving about, limited spawning	< 1 h	Light run
W-2	100–500 fish spawning at different times, fish ashore with many of the large waves	< 1 h	Good run
W-3	Hundreds of fish spawning at once in one or several areas of beach, locally heavy, may be brief or intermittent	≤ 1 h	Strong run
W-4	Thousands of fish together for an extended time, little sand visible between fish in one area, may extend along much of the shoreline	≤ 1 h	Excellent run
W-5	Fish covering the length of the beach, a silver lining along the surf, several individuals deep, impossible to see sand between fish	Peak density lasts ≥ 1 h	Incredible run



Figure 6-1. Grunion Monitoring Walker Scale (Martin, Karen L., et. al, 2021.)

Commencement of sand placement will be based on the following criteria (as established per the *OCPW Ocean Outlets Maintenance Revised Grunion Protection Plan* (2023a)):

- From March 1 to June 30 (the peak spawning season), if a grunion run consisting of 0 to 100 fish (less than Walker Scale 2) is reported within two weeks prior to sand placement, no avoidance action for grunion eggs is required. No mature grunion shall be buried or harmed as a result of sand placement.

- If a grunion run consisting of more than 100 fish (greater than or equal to Walker Scale of 2) is reported within two weeks prior to the start of sand placement, then mobilization and sand placement within those areas shall be avoided.
- After June 30 (end of peak spawning season), sand placement may be conducted if a grunion run of hundreds of fish spawning at different times or at once in several areas of beach (less than Walker Scale 4) is reported within two weeks prior to sand placement, assuming no other feasible avoidance and/or minimization measures are possible. No mature grunion shall be buried or harmed as a result of sand placement.

The preferred mitigation approach is avoidance of sand placement during grunion runs greater than or equal to Walker Scale of 2; however, in the event that avoidance is not feasible, minimization measures include:

- If sand placement has already begun when a grunion run consisting of hundreds of fish spawning at different times or at once in several areas of beach (less than Walker Scale 4) is reported, attempts shall be made to minimize impacts to grunion eggs through implementation of measures which may include relocating the placement footprint to areas where spawning did not occur or spawning occurred at lower levels.
- If sand placement has already begun when a grunion run consisting of thousands of fish together, with little sand visible between fish (greater than or equal to Walker Scale 4) is reported, sand placement activities shall avoid those areas.
- If spawning occurs and exceeds criteria within portions of a sand placement area, work in those areas will be avoided or rescheduled until the area is clear of grunion eggs. This may occur during the window in between two grunion runs (i.e., the two or three days before every full or new moon or when it has been otherwise determined that the eggs from the run have hatched or in the event the beach experiences significant erosion and eggs have been washed away).

Following every grunion run, communication with the agencies will occur. The communication will include date, time and location of monitoring event, procedures, and results. If grunion were observed, a record shall be prepared to document when and where grunion were observed and what, if any, minimization measures were implemented. If grunion runs do not exceed criteria, the responsible beach management entity may implement feasible minimization measures. Regulatory agencies will be advised of such activities and documentation of any impacts on grunion will also be provided.

6.2 SENSITIVE BIRD SPECIES MONITORING

The following is in compliance with PGM BIO-2 from the OC SCOUP IS/MND (County of Orange, May 2026).

6.2.1 Sensitive Bird Species Monitoring Trigger Criteria

Sensitive bird species monitoring is required for any sand placement event, regardless of volume, occurring within the nesting season of California least tern and/or Western snowy plover and potentially for receiver sites with potential snowy plover overwintering habitat, as defined by the biological resources maps provided in Appendix A.3 (Merkel 2025a) and as listed in Table 6-1.

The maximum extent of the snowy plover nesting season is March 1st to September 30th, although for some receiver sites, it may be shorter, e.g., April 1st to August 31st. Overwintering season for snowy plovers spans the remaining months of the year (October to February). The nesting season for least terns is April 1st to September 15th .

6.2.2 Sensitive Bird Species Monitoring Protocol

If sand placement is planned to occur during the least tern or snowy plover nesting season on beach receiver sites with the potential for least tern or snowy plover nesting (Table 6-1), a qualified biologist will conduct a pre-construction bird survey of the project area and as needed during construction as further defined below (Table 6-4).

Table 6-4. Sensitive Bird Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
March 1 to September 30 for beach receiver sites with plover nesting; April 1 to September 15 for receiver sites with least tern nesting; Year-round for receiver sites with snowy plover overwintering	Pre-project survey to occur once within 30 days prior to construction	Daily surveys for first 2 weeks and potentially weekly/biweekly thereafter	N/A

If snowy plovers or least terns are observed exhibiting nesting behaviors (scraping, territorial displays or call, false brooding, etc.) within 500 ft of the sand placement area, a monitor will conduct surveys each day during construction activities for the first 2 weeks of construction. After 2 weeks, the frequency of monitoring may be adjusted to a larger interval such as weekly or bi-weekly depending on initial results and consultation with agencies. A minimum 300-ft buffer will be established between the construction footprint and nesting site(s). Construction activities will only occur if the construction noise levels at the nest(s) site are at or below a peak of 65 dB. If construction noise exceeds a peak level of 65 dB at the nest(s) site, sound mitigation measures will be employed. If mitigation measures are ineffective in reducing noise levels below peak level, construction will not re-commence until either new sound mitigation measures can be employed or the birds have fledged.

During the nesting season, if snowy plovers and/or least terns are not observed exhibiting nesting behaviors but are roosting within 300 feet of the project footprint, no sound monitoring will be required. However, monitoring by a qualified biologist will continue throughout construction (following the same monitoring frequency as specified above) to ensure no harm is done until subsequent monitoring indicates shorebirds are no longer present. The qualified biologist shall have the ability to halt construction activities if necessary.

If sand placement is anticipated to occur during the snowy plover overwintering season on beach receiver sites with the potential for snowy plover overwintering (Table 6-1), a qualified biologist will conduct a pre-construction bird survey (within 30 days before sand placement) of the project area and train construction workers for monitoring for Western snowy plover roosting and foraging. The construction workers will monitor for snowy plover roosting and foraging over the duration of the sand placement period. If construction workers observe snowy plover roosting and foraging within 300 feet of the sand placement area, the workers will stop work until the snowy plover has fledged and will report the observance to the project biologist.

6.3 NEARSHORE HAPC MONITORING

Federally designated habitat areas of particular concern (HAPCs) occurring along the Orange County coastline include rocky reefs, surfgrass, kelp, eelgrass, and estuaries. While understory algae is included in habitat maps in both the CRSMP (Everest et al, 2013) and Noble (2017), it is only included as an indicator for the potential of HAPCs to exist and therefore the presence of understory algae alone is not considered an HAPC.

As stated in the CRSMP (Everest et al, 2013), several factors may contribute to the potential to impact sensitive habitats such as HAPC in the vicinity of sand placement activities:

- Distance between project activities and sensitive habitat,
- Project sand volume and duration of activity,
- Prevailing current direction and oceanographic conditions during and after project implementation,
- Physical characteristics of the hard-bottom habitat (e.g., predominant reef heights, spatial extent of hard-bottom area, resource development, natural sand flow dynamics through the hard-bottom area), and
- Occurrence of barriers (e.g., groin, jetty) that may contribute to sand accumulation.

It is important to note that natural shoreline processes move sediment along and perpendicular to the shoreline, i.e., nearshore resources are naturally continuously exposed to sediment influx. The monitoring protocols herein are intended to discern impacts from OC SCOUP sand placement versus natural processes, but this is likely to be challenging.

Eelgrass HAPC occurs only adjacent to harbor beaches (i.e., not along the open ocean beaches). All eelgrass monitoring will be per the *California Eelgrass Mitigation Policy* and in compliance with PGM BIO-7 from the OC SCOUP IS/MND (County of Orange, May 2026).

The following sections are relevant to rocky reef, surfgrass, and kelp HAPC which has the potential to occur along the open ocean beaches, and in compliance with PGM BIO-6 from the OC SCOUP IS/MND (County of Orange, May 2026).

6.3.1 Nearshore Monitoring Trigger Criteria

Proposed criteria to trigger nearshore (intertidal and subtidal) habitat monitoring was developed through a literature review of relevant previous beach nourishment projects, including project dimensions and volume, predicted/observed area of potential sedimentation, and resulting monitoring requirements/outcomes. The USACE San Clemente beach nourishment project was determined to be the most generally applicable project as it occurs within one of the most biologically sensitive regions of Orange County and incorporates recent and up-to-date data in its analysis. The USACE San Clemente project volume (250,000 cubic yards) and dimensions (3,500 linear feet of shoreline) are significantly larger than those anticipated as part of the OC SCOUP program and thus it provides a conservative estimate on the extent of project-related sedimentation. Modeling done as part of the USACE San Clemente Beach Nourishment Project EIS/EIR estimates that most sand from the nourishment will accumulate in the inshore (300 ft offshore at depths of 0 to -5 ft NAVD88) with little to no sand accumulating greater than 1,000 ft offshore. Based on this, the following "triggers" in which nearshore habitat monitoring would be required are proposed:

- For small projects (<25,000 cubic yards) on open ocean beaches, nearshore (rocky reef, surfgrass and/or kelp) monitoring is triggered only if the sand is placed below the MHTL **and** an HAPC (rocky reef, surfgrass and/or kelp) exists within 100 ft offshore of the sand placement area (directly offshore or within 1,000 upcoast of the sand placement area's upcoast limit or within 2,000 ft downcoast of the sand placement area's downcoast limit). Monitoring is not triggered if HAPC exists greater than 100 ft offshore in either the upcoast or downcoast direction.
- For medium projects (25,000-75,000 cubic yards) on open ocean beaches, nearshore (rocky reef, surfgrass and/or kelp) monitoring is triggered only if the sand is placed below the MHTL **and** an HAPC (rocky reef, surfgrass and/or kelp) exists within 300 ft offshore of the sand placement area (directly offshore or within 2,000 ft upcoast of the sand placement area's upcoast limit or within 5,000 ft downcoast of the sand placement area's downcoast limit). Monitoring is not triggered if HAPC exists greater than 300 ft offshore in either the upcoast or downcoast direction.
- For large projects (>75,000 cubic yards) on open ocean beaches, nearshore (rocky reef, surfgrass and/or kelp)monitoring is triggered only if the sand is placed below the MHTL **and** an HAPC (rocky reef, surfgrass and/or kelp) exists within 1,000 ft offshore of the sand placement area (directly offshore or within 2,000 ft upcoast of the sand placement area's upcoast limit or within 5,000 ft downcoast of the sand placement area's downcoast limit). Monitoring is not triggered if HAPC exists greater than 1,000 ft offshore in either the upcoast or downcoast direction.

The locations of known existing HAPCs (rocky reef, surfgrass and/or kelp) are shown in the biological resources maps provided in Appendix A.3 and as further discussed in Merkel (2025a). Reference information cites presence of surfgrass along some receiver sites (Corona del Mar, Little Corona del Mar, Crystal Cove, Salt Creek, Capistrano, Poche, San Clemente State, and Cyprus Shore/Cottons), however spatial data are not available for these locations (i.e., surfgrass is not shown in the Appendix A.3 maps for these locations). In the absence of surfgrass spatial data at these locations, surfgrass monitoring is triggered based on the location of rocky reef.

6.3.2 Open Ocean Beaches Nearshore Habitat Monitoring Protocol

6.3.2.1 Nearshore Monitoring Locations and Frequency- Small and Medium Projects

For small and medium volume projects which trigger nearshore monitoring, a minimum of two transects per HAPC habitat type will be monitored: 1 directly offshore of the placement site and 1 downcoast of the placement site ("downcoast" at the time of sand placement). Common transects may be sufficient to observe multiple habitat types if they co-exist along the same transect (e.g., rocky reefs and kelp beds). The transect length will be a minimum of 10 meters (33ft). Shorter transect lengths may be considered for small HAPC habitat areas whose major axis is significantly shorter than 10 meters.

Biological data will be collected three times for each small and medium project which triggers nearshore monitoring: prior to project construction (30 days or as soon as possible to be no later than 2 weeks before construction), immediately after project construction (2 weeks or as soon as possible to be no later than 30 days after construction), and 1 year after project construction.

6.3.2.2 Nearshore Monitoring Locations and Frequency - Large Projects

For large volume projects which trigger nearshore monitoring, a minimum of three transects per habitat type will be monitored: 1 directly offshore of the placement site, 1 downcoast ("downcoast" at the time of sand placement) of the placement site in an intertidal/shallow subtidal area (0ft to -10ft NAVD88), and 1 downcoast of the placement site in the subtidal (-10ft to -30ft NAVD88). Common transects may be sufficient to observe multiple habitat types if they co-exist along the same transect (e.g., rocky reefs and kelp beds). If budget is available, an additional transect will be established near the placement site but outside of the potential sedimentation area as a control; in this way, natural seasonal sedimentation can be quantified and subtracted against sedimentation observed within the project area to yield a more accurate estimate of project-related impacts. The transect length will be a minimum of 10m (33ft). Shorter transect lengths may be considered for small habitat areas whose major axis is significantly shorter than 10m.

Biological data will be collected three times for each large project which triggers nearshore monitoring: prior to project construction (30 days or as soon as possible to be no later than 2 weeks before construction), immediately after project construction (2 weeks or as soon as possible to be no later than 30 days after construction), and 1 year after project construction.

Table 6-5. Nearshore Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	Pre-project survey to occur 30-14 days before construction	N/A	Post project survey to occur 14-30 days and once 1 year after construction.

6.3.2.3 Rocky Reef Monitoring Parameters

The following monitoring parameters will be recorded as part of each survey within ten 1-square-meter sampling quadrants along each transect, in order to assess the condition of the nearshore reef and classify the reef as high or low relief:

- Estimated depth of sand cover (0, <1, 1 -3, 3-6, 6-9, >9 inches);
- If all or portions of reef are buried, estimated percent sand cover of reef;
- If all or portions of reef are not buried, estimated height of reef above adjacent sand;
- Substrate type as sand, cobble (< 10cm diameter), boulder (10cm - 1 m diameter), or bedrock (> 1 m diameter)
- General condition of the reef, such as the presence and health of macrophytes (aquatic plants visible to the naked eye), with specific attention towards indicator species.

The surveys will be performed by scuba divers or underwater drones /remotely operated vehicles.

6.3.3 Surfgrass Monitoring Parameters

The following monitoring parameters will be recorded as part of each survey along each transect, (as per Moffatt & Nichol (2006)), in order to assess the condition of the nearshore surfgrass:

- Estimated depth of sand cover;
- Estimated percent sand cover of surfgrass;
- Substrate type as sand, cobble (< 10cm diameter), boulder (10cm - 1 m diameter), or bedrock (> 1 m diameter);
- General condition of the surfgrass, such as if it appears healthy or not.

The substrate type and the presence/absence of surfgrass will be recorded at each 1 m mark along the 10-meter transect. If the surfgrass is patchy, they will estimate surfgrass shoot density along the entire reach within 1-square-meter areas. If the surfgrass is very dense (and there are too many plants to count), density will be determined in a 0.01-square-meter non-randomly placed quadrat within each 1-meter segment. If surfgrass is both dense and patchy, the survey biologist will determine the appropriate method on-site and may perform both methods along the same transect.

The surveys will be performed by scuba divers or underwater drones /remotely operated vehicles.

6.3.4 Kelp Monitoring Parameters

The following monitoring parameters will be recorded as part of each survey along each transect, (as per Moffatt & Nichol (2006)), in order to assess the condition of the nearshore kelp:

- Number and age of species of kelp;
- Holdfast diameter of giant kelp;
- General condition of the kelp, such as if it appears to be healthy or not.

These conditions will be recorded along the transect in a one-meter swaths, and conditions noted at each meter along the transect (1-square-meter measurement areas, or quadrants).

The surveys will be performed by scuba divers or underwater drones /remotely operated vehicles.

6.4 WATER QUALITY MONITORING

The following is in compliance with PGM BIO-4 from the OC SCOUP IS/MND (County of Orange, May 2026) and consistent with the Final SCOUP Plan (M&N, 2006).

6.4.1 Turbidity Monitoring Trigger

Turbidity monitoring will be required if:

- Sand is placed within the active intertidal zone, i.e., seaward of the MHTL **and**
- The project is a "large" project (sand placement volume >75,000 cubic yards) or the project is a "medium" project (sand placement volume between 25,000 – 75,000 cubic yards) with source material exceeding 25% fines content.

6.4.2 Turbidity Monitoring Protocol

If the need for turbidity monitoring is triggered, turbidity will be visually monitored by an observer from an elevated vantage point and documenting the spatial extent of turbid conditions. Monitoring of turbidity shall occur during and immediately after beach fill placement and continue daily throughout project construction until ocean conditions approach ambient after construction is complete. The observer will map the extent of any turbidity plume each day and photograph it. The observer will also document other pertinent environmental conditions such as waves, wind, and weather.

Table 6-6. Turbidity Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	N/A	Monitoring to occur daily during construction	Monitoring to occur immediately after construction until turbidity ceases

The turbidity monitoring person will have the authority to halt sand placement. If monitoring indicates an excessive turbidity plume (greater than ambient ocean condition beyond one-quarter

mile offshore or downcoast of the placement site) for 5 days or more, then sand placement will be halted or the placement rate (volume per hour) will be decreased to reduce turbidity to acceptable levels.

6.5 SURF MONITORING

6.5.1 Surf Monitoring Trigger Criteria

Surf monitoring will be required if:

- The receiver site is a beach where surfing is popular (rating of 3 or 4) and/or there is a particular wave break that warrants monitoring **and**,
- The project is a "large" project (sand placement volume exceeds 75,000 cubic yards), **and**
- The coarse sand content (greater than 2 mm (#10 sieve)) of the source material is greater than 20%.

Coarse sand typically moves to form an offshore sandbar in winter months that could potentially impact surf breaks (either positively or negatively). Finer sands are usually transported farther offshore and deposited in areas outside of the wave-breaking zone.

In previous large-scale beach nourishment projects, impacts to surfing have been typically minor and short-lived (typically not lasting longer than 6 months).

6.5.2 Surf Monitoring Protocol

Surfing activities and ocean conditions will be monitored starting 2 weeks prior to construction (sand placement) and again commencing 1 week after completion of construction for 8 weeks. Conditions will be observed for 30 minutes two times per week between 8 and 9 AM, or another suitable monitoring time depending on local surfing conditions. Observations will be made by human observers or through publicly accessible video cameras such as those operated by Surfline.com. Observations recorded during the post-construction period will be compared to the pre-project baseline conditions to evaluate any changes that may be attributable to the beach nourishment.

Table 6-7. Surf Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	Monitoring to occur within 2 weeks prior to construction	None	Monitoring to occur starting 1 week following completion of construction and continuing for 8 weeks

The following surf parameters will be recorded as possible:

1. Surf Height: Wave amplitude in feet for breaking surf height at the location where experienced surfers are catching waves (typically the "outside" break).
2. Wave Period: Average wave period in seconds based on time for multiple waves to pass a stationary point on screen.
3. Wave Direction: Primary single or mixed wave directional approach to beach within pre-defined bins (to the extent that the camera field of view and angle to the shoreline permit):
4. Surf Quality: Overall quality ranking of the surf using the "Surfability Scale" below:
    a. 1 = Poor: Poor surf with occasional (30%) Fair waves to ride.
    b. 2 = Fair: Very average surf with most (70%) waves rideable.
    c. 3= Good: Generally good surf with most (70%) Good waves.
5. Sea Surface Condition: Qualitative estimate of the smoothness/roughness of the water surface according to the following scale:
    a. 1 = smooth
    b. 2 = bumpy
    c. 3 = choppy
6. Tide: Water level (in feet, MLLW or NAVD88) measured at the U.S. Department of Commerce, NOAA, tide station at La Jolla (Station ID 9410230).
7. Comments: General comments from the observer describing the overall surfing conditions (e.g., quality of ride, length of ride, peaking, peeling, walled, shore break) and highlighting any significant influence on the surfing conditions by any of the specific environmental parameters (e.g., wind or tide).
8. Approximate number of surfers in the immediate beach receiver site vicinity.

6.6 BEACH PROFILE MONITORING

6.6.1 Beach Profile Monitoring Trigger Criteria

Beach profile monitoring will be triggered if the sand placement volume exceeds 75,000 cubic yards at a specific receiver site for a given event.

6.6.1.1 Beach Profile Monitoring Protocol

Beach profile surveys will be conducted along shore-perpendicular transects prior to and after construction of each placement project (within 30 days following construction completion and 1 year after construction start). A licensed surveyor or engineer experienced with the coastal survey methods will survey the beach profiles. The beach and seabed elevations along the profiles from the back of the beach out to the depth of closure will be recorded.

Table 6-8. Beach Profile Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	Monitoring to occur once within 30 to 14 days prior to construction	N/A	Post-project monitoring to occur once within 30 days following completion of construction and 1 year after construction start.

A minimum of two transects will be established: one within the sand placement footprint and one downcoast (as of time of sand placement) at a distance between approximately 1,500 to 3,000 feet from the downcoast end of the sand placement. Projects that occur in an area that overlaps an already existing beach profile monitoring program will utilize the results of that program in place of implementing a new set of transects.

6.7 TIDAL INLET MONITORING

The following is in compliance with PGM BIO-8 from the OC SCOUP IS/MND (County of Orange, May 2026).

6.7.1 Tidal Inlet Monitoring Trigger Criteria

Maintaining a connection to the ocean is essential for the health of coastal wetlands/marshes. Along the Orange County coastline, there are three wetlands/marshes with tidal inlets, from north to south: Bolsa Chica Wetlands, Talbert Marsh, and Santa Ana River Wetlands. Sand from beach nourishment has the potential to move along the coast and into the tidal inlet.

Tidal inlet monitoring is potentially required for sand placement at the following beaches which are adjacent to the three tidal inlets cited above:

- Bolsa Chica State Beach
- Huntington Bluffs Beach
- Huntington State Beach
- West Newport Beach

For small projects ($\leq$25,000 cubic yards) at the four beach receiver sites above, tidal inlet monitoring is triggered if a tidal inlet exist within 1,000 ft downcoast or upcoast of the sand placement limits.

For medium projects (25,000 -75,000 cubic yards) and large projects (>75,000 cubic yards) at the four beach receiver sites above, tidal inlet monitoring is triggered if a tidal inlet exists within 2,500 ft downcoast or upcoast of the sand placement limits.

6.7.2 Tidal Inlet Monitoring Protocol

Monitoring of the inlet will be conducted prior to, during and immediately after (within 30 days) construction, and once six months after construction. Monitors will qualitatively observe the condition of the inlet, including the presence or absence of sedimentation within the ocean inlet. The receiver site managing entity will be responsible for coordinating with the respective inlet managers should a project occur in the vicinity of an inlet. All three inlets are maintained by public agencies, the SAR and Talbert Marsh inlets are maintained by OCPW, and the Bolsa Chica inlet is maintained by the California State Lands Commission.

Table 6-9. Tidal Inlet Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	Monitoring to occur once within 30 to 14 days prior to construction	Monitoring to occur weekly throughout construction period	Monitoring will occur within 30 days and 6 months after construction*

** Closures of the tidal inlet may not necessarily be caused by OC SCOUP sand placement so communication with the tidal inlet manager will be important to understand other potential causes.*

6.8 CULTURAL RESOURCES MONITORING

6.8.1 Cultural Resources Monitoring Trigger Criteria

Cultural resources monitoring will be performed at all sites and in compliance with the standard condition (SC) CUL-1 and Regulatory Compliance Measure (RCM) CUL-1 from the OC SCOUP IS/MND (County of Orange, May 2026).

6.8.2 Cultural Resources Monitoring Protocol

Monitoring will be in compliance with the following measures from the OC SCOUP IS/MND (County of Orange, May 2026). Monitoring will be performed by construction contractor personnel in consultation with the beach receiver site managing entity staff and a Qualified Archaeologist.

SC CUL-1. If an archaeological resource is found, it will be examined by a Qualified Archaeologist. If it is determined by the Qualified Archaeologist to be indigenous in nature, a Native American representative will be consulted. If the Qualified Archaeologist determines the resource to be significant, avoidance and preservation in place will be the preferred manner of mitigating impacts pursuant to 15126.4(b)(3)(A). If avoidance is determined to be infeasible, the Qualified Archaeologist will prepare a data recovery and treatment plan tailored to the physical nature and characteristics of the resource. The data recovery plan will identify data recovery excavation methods, research questions, measurable objectives, and data thresholds to reduce any potential significant impacts to the resource. The resulting documentation will be submitted to the regional repository of the California Historical Resources Information System (CHRIS).

RCM CUL-1. Human Remains. In the event that human remains are encountered on The Program site, work within 50 feet of the discovery shall be redirected and the County Coroner notified immediately consistent with the requirements of California Code of Regulations (CCR) Section 15064.5(e). State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code (PRC) Section 5097.98. If the remains are determined to be Native American, the County Coroner shall notify the Native American Heritage Commission (NAHC), which shall determine and notify a Most Likely Descendant (MLD). With the permission of the property owner, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and non-destructive analysis of human remains and items associated with Native American burials. Consistent with CCR Section 15064.5(d), if the remains are determined to be Native American and an MLD is notified, the County shall consult with the MLD as identified by the NAHC to develop an agreement for treatment and disposition of the remains. Prior to the issuance of any permits, the Director of the Orange County Public Works Department, or designee, shall verify that all plans specify the requirements of CCR Section 15064.5(e), State Health and Safety Code Section 7050.5, and PRC Section 5097.98, as stated above..

Table 6-10. Cultural Resources Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	N/A	Monitoring to occur daily throughout construction period	N/A

7.0 STOCKPILE SITE MONITORING

This section provides the monitoring requirements, as applicable, when/if an upland sand stockpile site(s) is utilized.

7.1 TARPLANT MONITORING

Tarplant monitoring is only required at the Audubon Basin stockpile site, in order to avoid impacts to paniculate tarplant, a sensitive species.

In compliance with PGM BIO-1 from the OC SCOUP IS/MND (County of Orange, May 2026), a survey for presence of paniculate tarplant will be performed by a qualified biologist prior to any sand storage at the Audubon Basin stockpile site. If found, any paniculate tarplant will be fenced off with ribbon or yellow rope and t-posts and stockpiling and construction activities are to be avoided in the fenced-off area.

Table 7-1. Stockpile Site Tarplant Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
Year-round	Survey to occur once within 30 to 14 days prior to stockpiling activities	N/A	N/A

7.2 MIGRATORY BIRD AND RAPTOR NESTS MONITORING

Nests monitoring is for all the stockpile sites, in order to avoid impacts to migratory and/or raptor active nests, protected under the federal MBTA and CFG Code Sections 3503 and 3513.

In compliance with MM BIO-1 from the OC SCOUP IS/MND (County of Orange, May 2026), removal of stockpiled material that supports active nests within the stockpile area and surrounding work area should occur outside of the breeding season for applicable species (typically January 15-September 15), as far as is reasonably feasible. Where removal of stockpile material during the nesting season is unavoidable, a qualified biologist will conduct nesting bird surveys prior to commencement of work. If nesting birds are identified, the biologist will implement a suitable buffer zone around the nest(s) and a biological monitor will be on site daily io ensure that adverse impacts to the nesting birds do not occur.

Table 7-2. Stockpile Site Nests Monitoring Time Period Requirements

Monitoring Requirement Window	Monitoring Requirements Before Construction	Monitoring Requirements During Construction	Monitoring Requirements After Construction
January 15 – September 15	Survey to occur once within 3 days prior to stockpile material removal	Weekly if nests are present	N/A

8.0 CONSTRUCTION BMPs

In addition to the monitoring measures listed in the previous sections, the following construction best management practice measures will be implemented as required by the OC SCOUP IS/MND (County of Orange, May 2026).

PGM BIO-5. In order to avoid impacts to adjacent native habitats and/or downstream aquatic jurisdictional resources at site OC.S.3 (Audubon Basin), a buffer large enough to install, maintain, and inspect stockpile BMPs will be established between any stockpiled soil and the sides of the maintenance road, and the basin overflow/spillway channel that drains to native riparian habitat, such as a silt fence, compost-filled or biodegradable wattle, or other similar erosion and siltation controlling construction BMPs.

To avoid impacts to Greenville-Banning (D03) cement lined channel adjacent to site OC.S.2 (D03 D/S California at E01 Bike Trail), a buffer large enough to install, maintain, and inspect stockpile BMPs will be established between any stockpiled soil and the side of the maintenance road common to the channel.

To avoid impacts to open water and salt marsh habitats in the Bolsa Chica/Westminster Channel, adjacent to stockpile site OC.S.1 (C02/C04 Confluence), a buffer large enough to install, maintain, and inspect stockpile BMPs will be established between any stockpiled soil and hinge point of the adjacent channel. The triangular portion of this site will only be used for stockpile storage of sediment with less than 35% fines if stored over the wet season.

MM BIO-2. Placement of sand within each stockpile site will be located to the greatest extent possible within relatively flat terrain that is not in close proximity to and does not slope toward a potentially sensitive biological resource such as a jurisdictional aquatic resource or native habitat. Stockpiles not scheduled to be utilized within 14 days of placement will be considered non-active and the following protective measures will be implemented:

- Temporary perimeter sediment barriers such as compost-filled wattles temporary silt dykes, biodegradable fiber rolls, burlap sandbags/, gravel bags will be installed to provide erosion and sediment control and to protect the stockpile from wind and rain.
- Only biodegradable materials should be used for stockpile BMP protection, Any non-biodegradable BMP will be maintained and removed when no longer necessary.

RCM ENRG-1. The construction contractor will ensure that all construction trucks comply with CARB's idling restrictions (Title 17 CCR Section 93116), limiting idling to 5 minutes, except under safety-related or operational conditions.

RCM ENRG-2. The rail operator will reduce unnecessary locomotive idling where feasible, per 40 CFR Part 1033. Where practical, the use of Tier 4 or equivalent low-emission locomotives, automatic shutdown/startup systems, or electrification will be encouraged.

SC HAZ-1. Fueling and maintenance of construction vehicles will occur in designated areas away from surface water, with spill prevention measures in place.

SC HAZ-2. Fuels, oils, and other flammable materials will have secondary containment measures and will not be stored onsite. Storage should comply with California Fire Code Sections 5704 and 5706.

RCM HAZ-1. All Program locations will comply with the California Fire Code (Title 24, California Code of Regulations [CCR], Part 9) and the Cal/OSHA Construction Safety Orders for fire prevention (Title 8, CCR, Section 6777). The construction contractor will implement all applicable fire prevention and suppression measures, including maintaining fire suppression equipment on-site and training construction personnel in fire safety procedures. Compliance will be verified by the construction manager through regular site inspections during active construction.

SC HYD-1. The contractor will place impervious ground cover under construction equipment that is not in use to prevent leaks from entering surface and groundwater sources.

SC HYD-2. The contractor will regularly maintain construction equipment per manufacturer guidelines to prevent leaks from happening.

SC HYD-3. The contractor will avoid traversing in the wetted sand area except for required construction activities.

MM NOI-1. Where construction activities involving trains are planned within 25 feet of occupied structures or sensitive uses, the managing entity or construction contractor will notify property owners and provide the schedule, duration and contact information for noise-related concerns.

RCM NOI-1. All construction activities, including equipment warm-up, will be limited to the hours permitted by the local jurisdiction. Unless otherwise approved in writing by the City or County (depending on the jurisdiction where construction is taking place), construction will only occur during the dates and times listed in Table 2-1. No construction will occur on Sundays or federal holidays.

SC PS-1. Construction equipment will not block line-of-sight to the ocean at lifeguard towers. Sight lines from the viewing platforms of the lifeguard towers will be maintained and there will be no interference with views for the lifeguards.

SC PS-2. Mobile lifeguard towers will be temporarily relocated during construction to maintain public safety (only if relocation is necessary to conduct sand placement construction activities).

MM REC-1. Should a pipeline be used for sand placement, the pipeline will be covered with sand or other suitable mat material as needed at intervals to create walkover areas to facilitate public beach and water access.

MM REC-2. Public access to beaches and the ocean will be maintained adjacent to active sand placement area as long as public safety is not compromised.

MM REC-3. Signs will be posted advising the public of the presence of steep sand slopes (e.g., scarps) should they develop on beaches where sand has been placed.

PGM REC-1. Potentially dangerous scarps that may form after sand placement will be knocked down/laid back/graded by the beach managing entity.

RCM TRA-1. Prior to the start of any construction activity that will affect public roadways, the Contractor will prepare and implement a site-specific Traffic Control Plan (TCP) in accordance with local and state requirements (California Vehicle Code Section 21400 and 21401; California Code of Regulations Sections 1598 and 1599).

9.0 PROJECT NOTIFICATION REPORT

Prior to conducting any beach nourishment, a notification of an OC SCOUP event (project) will be submitted to the appropriate regulatory agencies, i.e., CCC, USACE, and Regional Water Quality Control Board (RWQCB). The required contents of the Project Notification Report (PNR) are outlined in the PNR Template (Appendix A.4). The notification will be submitted as early as possible, but no later than 30 days prior to commencement of a beach nourishment event. Agencies are requested to approve/deny the individual beach nourishment project within 30 calendar days of receipt of the PNR. If agencies do not respond within 30 calendar days of being notified, it will be assumed that it is acceptable for the project to be implemented.

Note: in previous opportunistic beach nourishment programs, this step was overly burdensome, resulting in increased project costs, time delays, and even loss of the beneficial use opportunity. OC staff seeks to work with the agencies to streamline this notification/ approval process for individual projects, given that the overall program will have gone through extensive environmental and regulatory review processes well before a specific opportunity arises.

An annual meeting with OCPW, beach managing entities and regulatory agencies should be considered. The OC *Countywide Routine Maintenance Program* permitted under RGP-100 currently implements an annual work plan meeting with regulatory agencies to go over all jobs that are projected to occur in the coming year. Each project is presented to the agencies, accompanied by a spreadsheet that details proposed monitoring and minimization measures (if necessary). This procedure has been met with favorable responses from both OCPW and regulatory agencies. It is a relatively quick process and should be considered for implementation in the OC SCOUP program.

10.0 PROCESS FOR IDENTIFYING/PRIORITIZING SAND RECEIVER SITES

OCPW will create a list of contacts for each of the potential receiver sites identified in Section 3.0. When source sediment becomes available, OCPW will notify all of the contacts via email to solicit interest.

In the event that there are multiple interested receiver sites for a potential source site, multiple factors will go into consideration as to which beach should receive the sand. A list of prioritization factors, not in any order, and including but not limited to:

- Receiver site has a HIGH need; this need is based on both erosion rates and infrastructure/amenities which are afforded shoreline protection from a nourished beach.
- Receiver site is within the watershed of the source site. If all interested receiver sites are within the source site watershed, then the receiver site closest to the source site, via haul distance, will be prioritized. It should be noted that current existing watersheds do not necessarily match historic conditions; for example, prior to being channelized, the Santa Ana River had a wide meandering mouth and nourished beaches over a much larger range than it does currently.
- Receiver site provides significant recreational opportunities to underserved communities, i.e., the receiver site is known to be popular with underserved communities and not just local residents;
- Receiver site agency has a defined available funding source.
- Receiver site proximity to source site and/or stockpile site. Additionally, haul routes will be considered and assessed for distance, cost, logistics, and ease of access.
- Receiver site acts as a "sand engine;" the term "sand engine" is used to define beach nourishments in which large amounts of sand are placed on a single receiver site and, through natural coastal processes, are redistributed to neighboring beaches.

11.0 COSTS AND FUNDING

For purposes of planning and budgeting, a high-level estimate of costs for implementation of an individual SCOUP project are provided:

- Sediment grain size and chemistry analyses, including laboratory costs and analyses of testing results ($20K - $50K)
- As-Needed Monitoring:
    - Sensitive Bird Species ($5K-$40K)
    - Grunion ($5K-$10K)
    - Nearshore Habitat ($50K-$100K)
    - Tidal Outlet ($2K-$5K)
    - Turbidity ($5K-$10K)
    - Surf ($40K-$60K)
    - Beach Profile ($50K-$70K)
    - Construction ($5K-$10K)
- Trucking of material ($15-$40 per cubic yard, dependent on haul distance)
- Transporting sand by rail ($10-$70 per cubic yard)
- If needed, screening of material prior to placement ($5 - $10 per cubic yard)
- If needed, off-site stockpiling and stockpile maintenance ($2-$6 per cubic yard, dependent on duration, size, equipment, and BMPs needed)
- Placement of sand and grading ($10 - $25 per cubic yard)
- Permit compliance notifications ($5K-$10K)

For a SCOUP project of approximately 30,000 cubic yards, the total cost (in 2026 dollars) could range from $800,000 (minimal monitoring) to $1,400,000 (high-end trucking cost and moderate amount of monitoring). Funding for each of the items listed above will be based on agreements to be established between the source site entity and receiver site entity.

12.0 POST-NOURISHMENT BEACH EQUILIBRATION

It is important to understand that the constructed beach profile will go through a natural beach equilibration process during and following construction. The nourished beach sand will move off and along the shoreline from waves and tidal action. This sand movement away from the nourished area is expected to occur and does not constitute a failure of the nourishment.

12.1.1 Near-Term Change

The post-construction beach fill profile will be steeper than the pre-construction beach profile. Periodic re-grading of the post-construction beach fill may be required to minimize scarping. Bulldozers can be used to reduce a vertical scarp, which may form as waves rework the seaward edge of the beach fill slope.

While the berm design herein specifies that construction profiles are approximately 5:1, and intermittent scarping may occur post-construction, ultimately the beach fill will naturally disperse over a wider portion of the beach and nearshore zone, resulting in a flatter equilibrium slope. The evolution of the beach profile to reach this equilibrium slope is a function of sediment grain size and wave characteristics. Flattening of the slope and profile adjustment causes reduction of the berm width from the post-construction profile.

The level of protection afforded by the nourished beach area after natural profile adjustment may remain approximately the same as that provided immediately after beach fill construction. This is because water depths will decrease in the nearshore zone causing waves to break farther from shore, reducing wave runup elevations at the beach from pre-project conditions.

12.1.2 Long-Term Change

Natural seasonal trends may shift sand away from the beach ultimately leaving it in a condition similar to or more eroded than pre-construction conditions. Sediments migrate along shore and cross-shore with the change of the seasons. Typical cross-shore seasonal conditions for California beaches include more erosive activity in the winter months when there are more storms and high wave events. During this time sand is eroded off the beach and stored in a nearshore sandbar. During the summer when conditions are milder there is modest accretion as the sandbar is depleted and sand is transported back onto the beach. Along-shore migration is also commonplace and seasonally variable amongst California beaches. However, typically Orange County beaches have a net sediment transport in the southern direction. Therefore, by contributing to the littoral cell, even if sand is eroded off the nourished beach, it still has the capability to benefit other beaches downcoast.

Over longer periods of time, other compounding effects can contribute to an overall trend of accretion, erosion, or neutrality. Beaches with higher rates of erosion may lose nourished sand over time and therefore should be prioritized for more frequent nourishments.

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APPENDIX A.1
Potential Sediment Sources

Source Name	Lat	Long	County	Reason for Excavation/Dredging	Source Type	Owner/Responsible Party	Identified in OC CRSMP	Excavation/Dredging Permit	Likelihood to Generate Beach Quality Sand	Volume of Sediment Availability (cy)	Frequency of Sediment Availability	Basin Design Capacity	Closest Receiver Site	Distance to Beach (miles)
Agua Chinon	33.6888	-117.6954	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes	RGP-100(channel)/Individual(basin)	High	16,125	biannual	64,500	City of Laguna Beach	11
Bee Canyon	33.7057	-117.7138	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes	RGP-100(channel)/Individual(basin)	Low	15,725	biannual	62,900	Crystal Cove State Park	12
E. Hicks Canyon	33.7236	-117.7187	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes	RGP-100/Individual	Low	2,025	biannual	8,400	Crystal Cove State Park	13
Galivan	33.5632	-117.6762	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	No	RGP-100					Aliso Beach	6
Harbor View	33.6034	-117.8668	Orange	Upland - OCPW Flood Control Maint	Dam	OCPW	No	RGP-100					Newport Harbor Beaches	1
Hicks Canyon	33.7361	-117.7164	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	No	RGP-100(channel)/Individual(basin)	Low	7,350	biannual	29,600	Crystal Cove State Park	13
Lower Peters Canyon	33.7603	-117.7726	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	No	Individual	Low	0		0	Newport Harbor Beaches	13
Marshburn	33.6941	-117.7299	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	No	RGP-100					Crystal Cove State Park	11
Miller Retarding Basin	33.86574	-117.85331	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes						Huntington Harbor Beaches	16
Orchard Estates	33.7384	-117.7467	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes	RGP-100(channel)/Individual(basin)	Low	11,490	biannual	35,150	Newport Harbor Beaches	13
Peters Canyon	33.7797	-117.7628	Orange	Upland - OCPW Flood Control Maint	Dam	OCPW	Yes	RGP-100					Newport Harbor Beaches	14
Rossmoor	33.7877	-118.0914	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	No	RGP-100					West Beach, Seal Beach	3
Round Canyon	33.6998	-117.6996	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes	Individual	Low	11,375	biannual	45,200	City of Laguna Beach	12
San Diego Creek 1	33.67154	-117.78721	Orange	Upland - OCPW Flood Control Maint	Creek	OCPW	Yes		Medium	370,000-530,000*		N/A	Crystal Cove State Park	7
San Diego Creek 2	33.63416	-117.73901	Orange	Upland - OCPW Flood Control Maint	Creek	OCPW	Yes		Medium	3,000*		N/A	City of Laguna Beach	7
San Diego Creek 3	33.65526	-117.84503	Orange	Upland - OCPW Flood Control Maint	Creek	OCPW	Yes		Medium	181,045*		N/A	Newport Harbor Beaches	5
Lower San Juan Creek	33.46389	-117.68301	Orange	Upland - OCPW Flood Control Maint	Creek	OCPW	Yes	RGP-100	Low				Doheney State Beach	0
Sulphur Creek	33.55	-117.7063	Orange	Upland - OCPW Flood Control Maint	Dam	OCPW	No	RGP-100					Aliso Beach	4
Trabuco Retarding Basin	33.6965	-117.7558	Orange	Upland - OCPW Flood Control Maint	Retarding Basin	OCPW	Yes	RGP-100(channel)/Individual(basin)	Low	0		0	Crystal Cove State Park	10
Yorba Linda	33.8713	-117.8144	Orange	Upland - OCPW Flood Control Maint	Reservoir	OCPW	Yes	RGP-100					Huntington Harbor Beaches	18
Villa Park	33.8163	-117.7638	Orange	Upland - OCPW Flood Control Maint	Dam	OCPW	No	RGP-100					Newport Harbor Beaches	17
Lower Santa Ana River	33.66053	-117.94865	Orange	Upland - OCPW Flood Control Maint	Flood Control	OCPW	No		High	10,000	annual		West Neport Beach	2
Borrego Wash	33.66649	-117.70156	Orange	Upland - OCPW Flood Control Maint	Creek	OC Parks	No	RGP-100	High	1,000		N/A	City of Laguna Beach	10
Big Canyon	33.6121	-117.8554	Orange	Upland - Other	Reservoir	City of Newport Beach	Yes						Newport Harbor Beaches	2
Brea Dam	33.89167	-117.925	Orange	Upland - Other	Reservoir	USACE- Los Angeles District	No		High	4,000			Huntington Harbor Beaches	15
Brea Dam- Saddle Dike 1	33.90232	-117.92747	Orange	Upland - Other	Reservoir	USACE- Los Angeles District	No						Surfside Beach	15
Carbon Canyon	33.91458	-117.84006	Orange	Upland - Other	Reservoir	USACE- Los Angeles District	Yes	RGP-100(channel)	High	2,600	annual		Huntington Harbor Beaches	19
Diemer	33.9109	-117.8193	Orange	Upland - Other	Reservoir	Metropolitan Water District Of Southern California	No						Huntington Harbor Beaches	19
Dove Canyon	33.6386	-117.5692	Orange	Upland - Other	Lake	Dove Canyon Masters Association	No						Aliso Beach	14
Eastfoot	33.75079	-117.75433	Orange	Upland - Other	Retarding Basin	City of Irvine	No						Newport Harbor Beaches	13
El Toro	33.6241	-117.6682	Orange	Upland - Other	Resovoir	El Toro Water District	Yes						City of Laguna Beach	9
Fullerton	33.89648	-117.88587	Orange	Upland - Other	Reservoir	USACE- Los Angeles District	Yes		High	1,300	annual		Huntington Harbor Beaches	19
Laguna	33.90817	-117.9362	Orange	Upland - Other	Lake		Yes						Surfside Beach	15
Mission Viejo	33.6271	-117.6492	Orange	Upland - Other	Lake	Lake Mission Viejo Association, Inc.	Yes						City of Laguna Beach	10
Orange County Resovoir	33.9367	-117.8842	Orange	Upland- Other	Resovoir	Metropolitan Water District Of Southern California	No						Huntington Harbor Beaches	18
Palisades	33.4638	-117.6522	Orange	Upland- Other	Resovoir	South Coast Water District	Yes						Capistrano Shores	1
Portola	33.6307	-117.5836	Orange	Upland- Other	Dam	Santa Margarita Water District	No						Aliso Beach	13
Prado	33.89169	-117.64347	Riverside	Upland - Other	Dam	USACE- Los Angeles District	Yes		High	30,000	annual		Newport Harbor Beaches	25
Rattlesnake Canyon	33.7295	-117.7421	Orange	Upland - Other	Resovoir	Irvine Ranch Water District	Yes	RGP-100(channel)					Crystal Cove State Park	12
Rossmoor No. 1	33.6192	-117.7304	Orange	Upland - Other	Resovoir	El Toro Water District	Yes	RGP-100(channel)					City of Laguna Beach	6
San Joaquin	33.6202	-117.8418	Orange	Upland - Other	Reservoir	Irvine Ranch Water District	Yes	RGP-100(channel)					Crystal Cove State Park	3

Source Name	Lat	Long	County	Reason for Excavation/Dredging	Source Type	Owner/Responsible Party	Identified in OC CRSMP	Excavation/Dredging Permit	Likelihood to Generate Beach Quality Sand	Volume of Sediment Availability (cy)	Frequency of Sediment Availability	Basin Design Capacity	Closest Receiver Site	Distance to Beach (miles)
Sand Canyon	33.6477	-117.7947	Orange	Upland - Other	Dam	Irvine Ranch Water District	Yes	RGP-100(channel)					Crystal Cove State Park	6
Santiago Creek (Irvine Lake)	33.7863	-117.7226	Orange	Upland - Other	Lake	Serrano Water District and Irvine Ranch Water District	Yes						Newport Harbor Beaches	16
Syphon Canyon	33.7097	-117.7326	Orange	Upland - Other	Resovoir	Irvine Ranch Water District	No						Crystal Cove State Park	11
Trabuco	33.6445	-117.562	Orange	Upland - Other	Retarding Basin	Trabuco Canyon Water District	Yes	RGP-100(channel)					Capistrano County Beach Park	14
Trampas Canyon	33.4988	-117.5837	Orange	Upland - Other	Resovoir	Santa Margarita Water District	No						Poche Beach	5
Upper Chiquita	33.5883	-117.6156	Orange	Upland - Other	Resovoir	Santa Margarita Water District	No						Capistrano County Beach Park	10
Upper Oso Dam	33.6597	-117.632	Orange	Upland - Other	Reservoir	Santa Margarita Water District	Yes	RGP-100(channel)					City of Laguna Beach	12
Veeh	33.6254	-117.7329	Orange	Upland - Other	Reservoir	Lake Hills Community Church	Yes	RGP-100(channel)					City of Laguna Beach	7
Walnut Cyn	33.8412	-117.7525	Orange	Upland - Other	Resovoir	City of Anaheim	Yes	RGP-100(channel)					Newport Harbor Beaches	18
30 Mg Central Resovoir	33.926	-117.9091	Orange	Upland - Other	Resovoir	City of Brea	No						Surfside Beach	17
Santa Ana River Ocean Outlet	33.62951	-117.95799	Orange	Ocean Outlets - OCPW Maintenance	Flood Control	OCPW	Yes	RGP-46	High	200,000	annual	N/A	West Neport Beach	0
Talbert Channel Outlet	33.63183	-117.96145	Orange	Ocean Outlets - OCPW Maintenance	Flood Control	OCPW	No	RGP-46	High	35,000	annual	N/A	West Neport Beach	0
Salt Creek Outlet	33.48159	-117.72448	Orange	Ocean Outlets - OCPW Maintenance	Flood Control	OCPW	No	RGP-46		1,000	semiannual	N/A	Salt Creek	0
Estrella Outlet	33.45033	-117.65966	Orange	Ocean Outlets - OCPW Maintenance	Flood Control	OCPW	No	RGP-46		500	semiannual	N/A	Capistrano Shores	0
Segunda Deshecha Outlet	33.43155	-117.63274	Orange	Ocean Outlets - OCPW Maintenance	Flood Control	OCPW	No	RGP-46		1,000	semiannual	N/A	San Clemente North Beach	0
Aliso Creek Outlet	33.51154	-117.75245	Orange	Ocean Outlets - OC Parks Maintenance	Flood Control	OC Parks	No					N/A	Poche Beach	0
Poche County Beach Outlet	33.44103	-117.64515	Orange	Ocean Outlets - OC Parks Maintenance	Flood Control	OC Parks	No					N/A	Huntington Cliffs	0
Bolsa Chica Ecological Reserve	33.68674	-118.03564	Orange	Wetlands/Estuary Maintenance	Wetland	CSLC	Yes		High	65,000-450,000	1-3 years	N/A	West Newport Beach	1
tington Beach Wetlands, Talbert M	33.63781	-117.96624	Orange	Wetlands/Estuary Maintenance	Wetland	HBWC	Yes		High	15,000	5-10 years	N/A	West Neport Beach	0
Lapeyre Quarry	33.50299	-117.58428	Orange	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	Poche Beach	6
FST Sand and Gravel	33.80286	-117.50377	Riverside	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	City of Laguna Beach	24
Hanson Eagle Valley	33.83721	-117.49717	Riverside	Commercial	Quarry	Private	Yes		High	100,000+	annual	N/A	City of Laguna Beach	26
Vulcan Materials Company	33.85958	-117.52068	Riverside	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	City of Laguna Beach	27
CEMEX	34.10213	-117.18155	San Bernadin	Commercial	Quarry	Private	Yes		High	100,000+	annual	N/A	City of Laguna Beach	52
Granite Construction Company	34.5426	-118.00951	Los Angeles	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	West Beach, Seal Beach	56
Holiday Rock Quarry	34.54336	-117.98973	Los Angeles	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	West Beach, Seal Beach	56
75th Street Quarry and Recycling	34.57306	-117.99527	Los Angeles	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	West Beach, Seal Beach	58
HI-Grade Materials	34.53974	-118.0149	Los Angeles	Commercial	Quarry	Private	No		High	100,000+	annual	N/A	West Beach, Seal Beach	55

APPENDIX A.2

Programmatic Sediment Sampling and Analysis Plan

Programmatic Sampling and Analysis Plan –

Orange County Sand Compatibility and Opportunistic Use Program (OC SCOUP)

Last modified: 28 May 2026

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Appendix A - Beach Receiver Sites Grain Size Distribution Envelopes

1 Introduction

The purpose of this document is to define the sampling and analysis protocols for the Orange County Sand Compatibility and Opportunistic Use Program (OC SCOUP) for when source sediment from various potential sites become available for beach nourishment. The objective of SCOUP is to beneficially use beach-quality sediment from maintenance or construction activities for placement on Orange County beaches, instead of disposing the sediment at a landfill or using it for upland construction.

The Programmatic nature of this OC SCOUP SAP is to have sampling and analysis plans and protocols pre-approved by regulatory agencies for when source sediment opportunities arise in the future. It is understood that it is not possible to pre-approve the sampling design for the spectrum of potential source sites, so the sampling design for individual opportunistic events will need to be submitted for regulatory agency approval for each opportunistic event. All other sections of this Programmatic SAP are considered to be pre-approved and will be followed for all source site opportunities.

Regulatory agencies will approve the use of the source sediment for beach placement based on the source site sampling and analysis results and other information provided in the Project Notification Report (process described further below).

As defined in the OC SCOUP Implementation Guidelines, the criteria for suitability of the source sediment for beach placement includes:

- chemistry
- grain size
- color
- debris/organic/vegetation content
- compactability/moldability
- caulerpa (for marine-originated sediment only)

The details of each of these criteria are defined in this Programmatic SAP (PSAP).

This PSAP has been developed in conformance with the U.S. Army Corps of Engineers Los Angeles District and U.S. Environmental Protection Agency Region 9 *Sampling and Analysis Plan/Results (SAP/R) Guidelines* dated July 1, 2021 (USACE/USEPA, 2021).

2 Process for Evaluating Opportunistic Sediment

The complete set of steps for evaluating opportunistic source sediment, obtaining regulatory approvals, and implementing the plan is described in the OC SCOUP Implementation Guidelines.

For each proposed project (proposed nourishment event), the sampling and testing methods and analyses will follow this SAP guidance.

3 Methods

3.1 Sampling Methodology

3.1.1 Sampling Design

The source sediment sampling design will be dependent upon the type, location, and history of the sediment source site. **Given the need for tailoring the sampling design based on the specific source sediment site, the sampling design for each source site will need to be submitted to and approved by the USEPA and CCC for each and every opportunistic event.**

In general, sample locations will be distributed throughout the source site excavation area (only the portion to be used for beach nourishment) to obtain adequate spatial coverage, while also proportionally representing the volume to be excavated/dredged. Core samples will be taken to the full excavation depth and collected across the source site in a manner that captures anticipated variation.

Careful consideration will be given to the compositing scheme and sediment samples will only be composited together when there is reason to believe that sediment throughout that portion of the source site excavation area or sorted stockpiles are similar (in terms of grain size, etc.) and is exposed to the same influences and potential pollutant sources. Particular consideration for sampling at variable depths and non-contiguous areas will be taken such that, when in doubt, additional samples will be collected.

Visual observation of source material will occur on a continuous basis during the excavation processes by field workers to identify any obvious visual (or sensory, e.g., odor) changes in the material. The appropriate staff will be notified of any observed material change as soon as practicable, and the relevant material parameters, such as color, texture, moisture, gravel content, depth, and/or location of the changed material will be recorded. Additional samples will be collected whenever a suspected or observed change in material occurs.

As the source material(s) may be mixed, screened, and/or stockpiled prior to exporting, quality assurance samples will be collected of the material in the final condition that is proposed to be used on the placement beach(es).

3.1.2 Sample Collection and Vertical Control

All sampling equipment (including bowls, spoons, buckets, core catcher etc.) will be decontaminated between each sampling location using an Alconox rinse. The position of the sample will be recorded using Global Positioning System (GPS). Target depths for each of the cores will be generated based on the proposed depth of cut in that location. Each core is proposed to be vertically composited along the entire length of sample if no significant stratification exists. If there are stratification layers that may be related to contaminant patterns, the layer(s) may be sub-sampled and analyzed separately in order to characterize the potential pollutant layer. Each core will be photographed, and descriptive logs will be generated for each of the borings to document sediment properties. An archive sample from each core will be preserved for future analysis if needed.

The material from each core will be collected into containers as listed in Table 1. During compositing, proportionate volume (based on relative core lengths) of the homogenized sediment from each core will be combined to form a single composite sample for each composite area. The sample material will be stirred and homogenized until a consistent color and texture is achieved (USEPA and USACE, 1998). A sufficiently homogenized sample will be prepared to provide adequate volume for all laboratory analyses. Portions of each composite sample will be placed in

laboratory supplied containers for specific analyses. Each sample container will be labeled with the project name, sample/composite identification, type of analysis to be performed, date and time, and initials of the person preparing the sample.

Table 1: Sample Volumes, Containers, Preservation Techniques, and Holding Times for Physical, Chemical and Biological Testing

Parameter	Sample Volume for Analysis	Container Size and Type	Sample Preservation Technique	Holding Time
Metals	40 g sediment	1 x 4-oz glass	Cool 4°C	6 M Metals; 90 D Mercury
			Freeze -20°C	1 Year
PAHs PCBs Pesticides Organotins	50 g sediment		Cool 4°C	14 Days
			Freeze -20°C	1 Year
Total Solids TOC	5 g sediment		Cool 4°C	14 Days
			Freeze -20°C	1 Year
Grain Size	50 g sediment	1 x 4-oz HDPE Ziploc bag	Ambient Temperature	No hold time
QC Analysis	200 g sediment from one Composite Sample	1 x 8-oz glass	-	-
Archive Samples	100 g sediment	Composites: 1 x 16 oz glass Cores: 1 x 8 oz glass	-	-
Biological Testing – Solid Phase, Suspended Particulate Phase	50-60 L sediment, 15 gal site water	HDPE bag 15 gal cubitainer	Cool 4°C	8 weeks

3.1.3 Field Notes

Field notes will be maintained during sampling and compositing operations. The field notes will include the following information.

- Name of person(s) collecting and logging the samples
- General weather conditions and other general observations
- Date and time of collection
- Sample station number and sample description
- Core collection information:
  - Core attempt number
  - Core location
  - Penetration depth/elevation
  - Core recovery
- Any deviation from the approved sampling plan
- Photographs, if needed

3.1.4 Sample Nomenclature

Samples will use a consistent nomenclature across all samples collected. Core or surface grab sample names will begin with a three- character source site designator (e.g., SAR for Santa Ana River) followed by an 8-digit date. Individual sample locations within the excavation unit or composite area will be identified using numbers (1, 2, 3…), and each excavation area and/or composite area will be labeled alphabetically (A, B, C…). Examples of individual or aliquot sample names would then be: SAR-20250731-1-A, SAR-20250731-2-A. Composited samples will be designated with a "C" before area label. An example of a composite sample is SAR-20250731-C-A for a composite sample of excavation area A collected July 31, 2025.

3.1.5 Sample Transport and Chain-of-Custody Procedures

A chain-of-custody (COC) record for each sample will be maintained throughout all sampling activities and will accompany samples and shipment to the laboratory. Information tracked by the COC records in the laboratory include sample identification number, date and time of sample receipt, analytical parameters required, location and conditions of storage, date and time of removal from and return to storage, signature of person removing and returning the sample, reason for removing from storage, and final disposition of the sample.

3.1.6 Holding Times

All samples will be transported to the laboratories within the holding times required for the analytes to be tested (Table 1). All samples for physical, chemical, and potentially biological analyses will be maintained at the testing laboratories at the appropriate temperature for the analytes and bioassay tests. Sediment samples reserved for potential supplementary testing will be stored under COC by the analytical and toxicity laboratories.

The samples will be composited in the field or laboratory. The composite date will serve as the start time for biological and chemical evaluations. Bioassay testing will begin as soon as possible, prior to the 8-week holding period.

3.1.7 Quality Assurance/Quality Control

Quality assurance procedures to be used for sediment testing are consistent with methods described in the ITM (USEPA/USACE 1998). The procedures include documentation of the following criteria for each sample matrix type for trace analysis: analytical reproducibility, analytical detection limits, recovery of in situ metals and organics, and sample COC documentation.

The quality assurance objectives for testing are detailed in individual Laboratory QA Manuals and USEPA SW-846. Objectives for accuracy and precision involve all aspects of the testing process including:

- Methods and Standard Operating Procedures (SOPs);
- Calibration Methods and Frequency;
- Data Analysis, Validation and Reporting;
- Internal Quality Control;
- Preventive Maintenance; and
- Procedures to Assure Data Accuracy and Completeness.

3.1.8 Sample Storage and Tracking

Sample COC sheets, sample receipt logs, sample holding, and sample labeling procedures are detailed in individual laboratory SOPs and are audited periodically by Control staff. Sample storage conditions and holding times are adhered to strictly. Samples are archived throughout the testing period until the final report is accepted.

3.1.9 Chemistry QC Samples

Environmental sample matrix spike and matrix spike duplicate analysis will be performed at a rate of 5%. Either the imaginary matrix as described in USEPA SW-846 or a laboratory solid (e.g., sodium sulfite) will be used for preparing matrix spikes in the absence of adequate sample quantity to perform matrix spiking for all matrix types. Matrix spikes are from an environmental sample that is split into three separate aliquots. One aliquot is analyzed free from matrix spike introduction. A known concentration of the analyte of interest is added to the other two aliquots prior to sample preparation and analysis. Both percent recovery and relative percent difference are reported for matrix spikes/matrix spike duplicates. Spike data can provide an indication of matrix bias or interference on analyte recovery. Duplicate data can provide an indication of laboratory precision. Method or reagent blanks will be analyzed at a frequency of 5% or for every analytical batch, whichever is greater. Analytical batches will consist of 20 or fewer samples. Results of all laboratory QC analyses will be reported with the final data. Any QC samples that fail to meet the QC criteria specified in the methodology or in this SAP will be identified and the corresponding data appropriately qualified in the final report. All QA/QC records for the various testing programs will be kept on file for review by regulatory agency personnel. It is also anticipated that USACE, Regional Water Quality Control Board (RWQCB), and/or USEPA personnel may be present during sampling and may visit the laboratory during testing.

3.1.10 Data Analysis, Validation, and Reporting

Physical and chemical tests are to be performed consistent with protocols and conditions listed in laboratory SOPs. Raw data and study records are checked to ensure that required test conditions are within specifications cited in the SOPs. Major deviations (e.g., those that could potentially affect test results) from protocol must be approved by both the client and the Quality Control Manager. Unforeseen circumstances that may affect the integrity of the study are reported with the test results. The data, analysis and report are also reviewed for accuracy by the Quality Control Manager.

3.2 Physical and Chemical Testing

Samples will be analyzed consistent with USACE and USEPA established protocols as outlined in the ITM (USEPA/USACE 1998) and SAP guidance (USEPA/USACE 2021). Sediment samples will be submitted for analysis of total solids, total organic carbon (TOC), grain density, ammonia, total sulfides, specific gravity, total recoverable petroleum hydrocarbons (TRPH), metals, PAHs, chlorinated pesticides, and PCB congeners. (Testing will not be required for pyrethroids, and organotins based on probable lack of presence in the source material). Table 2 lists the proposed conventional/physical and chemical parameters, recommended analytical methods, target method detection limits (MDL), and reporting limits (RL) for the evaluation of sediment samples. If the target detection limits cannot be attained, a detailed explanation will accompany the data providing the reasons for not attaining the required detection limits.

Table 2: Proposed Conventional and Chemical Parameters, Recommended Analytical Methods, and Target, Method Detection, and Reporting Limits for Sediment Samples

Parameter	Analytical Method	Method Detection Limit[1]	Reporting Limit[1]
Conventional Parameters			
Total solids (%)	SM 2540B	0.1	0.1
TOC (%)	USEPA 9060A	0.01	0.01
Grain size (%)	Plumb (1981) or C117/C137 or CTM 201/202 [2]	0.05	0.05
Ammonia (%)	SM 4500-NH3 D	0.02	0.03
Total Sulfides (%)	Plumb (1981) and TERL	0.2	0.4
TRPH (mg/kg)	SM 2560 D	100	200
Metals (mg/kg)			
Arsenic	USEPA 6020	0.025	0.05
Cadmium	USEPA 6020	0.0025	0.005
Chromium	USEPA 6020	0.0025	0.005
Copper	USEPA 6020	0.0025	0.005
Lead	USEPA 6020	0.0025	0.005
Mercury	USEPA 245.7	0.00001	0.00002
Nickel	USEPA 6020	0.01	0.02
Selenium	USEPA 6020	0.025	0.05
Silver	USEPA 6020	0.01	00.2
Zinc	USEPA 6020	0.025	0.05
PAHs (µg/kg)			
1-Methylnaphthalene	USEPA 8270E	0.084	0.5
2,3,5--Trimethlynapthalene	USEPA 8270E	0.059	0.5
2,6- Dimethylnapthalene	USEPA 8270E	0.065	0.5
2-Methylnaphthalene	USEPA 8270E	0.106	0.5
Acenaphthene	USEPA 8270E	0.078	0.5
Acenaphthylene	USEPA 8270E	0.058	0.5
Anthracene	USEPA 8270E	0.046	0.5
Benzo[a]anthracene	USEPA 8270E	0.107	0.5
Benzo[a]pyrene	USEPA 8270E	0.106	0.5
Benzo[e]pyrene	USEPA 8270E	0.098	0.5
Benzo[b]fluoranthene	USEPA 8270E	0.063	0.5
Benzo[g,h,i]perylene	USEPA 8270E	0.093	0.5
Benzo[k]fluoranthene	USEPA 8270E	0.111	0.5
Biphenyl	USEPA 8270E	0.092	0.5
Chrysene	USEPA 8270E	0.067	0.5
Dibenzo(a,h)anthracene	USEPA 8270E	0.106	0.5
Fluoranthene	USEPA 8270E	0.035	0.5
Fluorene	USEPA 8270E	0.068	0.5
Indeno[1,2,3-c,d]pyrene	USEPA 8270E	0.087	0.5
Naphthalene	USEPA 8270E	0.187	0.5
Phenanthrene	USEPA 8270E	0.074	0.5
Pyrene	USEPA 8270E	0.048	0.5
Organochlorine Pesticides (µg/kg)			
2,4-DDD	USEPA 8270E	0.267	0.5
2,4-DDE	USEPA 8270E	0.2	0.5
2,4-DDT	USEPA 8270E	0.194	0.5

Parameter	Analytical Method	Method Detection Limit[1]	Reporting Limit[1]
4,4-DDD	USEPA 8270E	0.198	0.5
4,4-DDE	USEPA 8270E	0.193	0.5
4,4-DDT	USEPA 8270E	0.128	0.5
Aldrin	USEPA 8270E	0.25	0.5
BHC-alpha	USEPA 8270E	0.25	0.5
BHC-beta	USEPA 8270E	0.25	0.5
BHC-delta	USEPA 8270E	0.25	0.5
BHC-gamma	USEPA 8270E	0.25	0.5
Chlordane-alpha	USEPA 8270E	0.187	0.5
Chlordane-gamma	USEPA 8270E	0.179	0.5
cis-Nonachlor	USEPA 8270E	0.192	0.5
Dieldrin	USEPA 8270E	0.1	0.2
Endosulfan I	USEPA 8270E	0.25	0.5
Endosulfan II	USEPA 8270E	0.25	0.5
Endosulfan Sulfate	USEPA 8270E	0.25	0.5
Endrin	USEPA 8270E	0.25	0.5
Endrin Aldehyde	USEPA 8270E	0.25	0.5
Endrin Ketone	USEPA 8270E	0.25	0.5
Heptachlor	USEPA 8270E	0.25	0.5
Heptachlor Epoxide	USEPA 8270E	0.25	0.5
Methoxychlor	USEPA 8270E	0.25	0.5
Oxychlordane	USEPA 8270E	0.25	0.5
Toxaphene	USEPA 8270E - NCL	10	20
trans-Nonachlor	USEPA 8270E	0.186	0.5
PCB Congeners (µg/kg)			
PCB 018	USEPA 8270E	0.029	0.2
PCB 028	USEPA 8270E	0.023	0.2
PCB 037	USEPA 8270E	0.06	0.2
PCB 044	USEPA 8270E	0.028	0.2
PCB 049	USEPA 8270E	0.036	0.2
PCB 052	USEPA 8270E	0.012	0.2
PCB 066	USEPA 8270E	0.027	0.2
PCB 070	USEPA 8270E	0.023	0.2
PCB 074	USEPA 8270E	0.021	0.2
PCB 077	USEPA 8270E	0.018	0.2
PCB 081	USEPA 8270E	0.084	0.2
PCB 087	USEPA 8270E	0.081	0.2
PCB 099	USEPA 8270E	0.028	0.2
PCB 101	USEPA 8270E	0.027	0.2
PCB 105	USEPA 8270E	0.047	0.2
PCB 110	USEPA 8270E	0.074	0.2
PCB 114	USEPA 8270E	0.072	0.2
PCB 118	USEPA 8270E	0.069	0.2
PCB 119	USEPA 8270E	0.071	0.2
PCB 123	USEPA 8270E	0.018	0.2
PCB 126	USEPA 8270E	0.086	0.2
PCB 128	USEPA 8270E	0.081	0.2
PCB 138	USEPA 8270E	0.057	0.2

Parameter	Analytical Method	Method Detection Limit[1]	Reporting Limit[1]
PCB 141	USEPA 8270E	0.1	0.2
PCB 149	USEPA 8270E	0.092	0.2
PCB 151	USEPA 8270E	0.073	0.2
PCB 153	USEPA 8270E	0.065	0.2
PCB 156	USEPA 8270E	0.089	0.2
PCB 157	USEPA 8270E	0.103	0.2
PCB 158	USEPA 8270E	0.074	0.2
PCB 167	USEPA 8270E	0.049	0.2
PCB 168+132	USEPA 8270E	0.094	0.2
PCB 169	USEPA 8270E	0.116	0.2
PCB 170	USEPA 8270E	0.118	0.25
PCB 177	USEPA 8270E	0.085	0.25
PCB 180	USEPA 8270E	0.154	0.25
PCB 183	USEPA 8270E	0.056	0.25
PCB 187	USEPA 8270E	0.168	0.25
PCB 189	USEPA 8270E	0.109	0.25
PCB 194	USEPA 8270E	0.164	0.25
PCB 201	USEPA 8270E	0.104	0.25
PCB 206	USEPA 8270E	0.155	0.25

Notes:

[1] Method detection limits and reporting limits may vary due to moisture content of sample or matrix interference.

[2] Grain size will be tested with the following sieve sizes, at a minimum: ¾", ½", #4, #8, #10, #16, #30, #40, #50, #60, #100, and #200.

µg/kg = micrograms per kilogram
(M) = modified
mg/kg = milligrams per kilogram
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphenyl
SIM = selected ion monitoring
SM = Standard Method
TOC = total organic carbon
TQ/EI = triple quadrupole/electron impact ionization
USEPA = U.S. Environmental Protection Agency

4 Comparison to Beach Placement Suitability Criteria

4.1 Chemistry

To evaluate chemical suitability of the source sediment for beach placement, the source sediment chemical concentrations will be compared to sediment quality guidelines effects range low (ERL) and effects range median (ERM) values developed by Long, et al. (1995) and to USEPA Regional Screening Levels (RSLs) for residential soils (USEPA, 2025). These thresholds are shown in Table 3. The ERL and ERM allow for a general comparison to an effects-based database for marine resources. The RSLs are used for assessing the source sediment's suitability for human recreational contact. USEPA deemed RSLs to be protective for humans over a lifetime. RSLs do not represent ecological impact contaminant levels.

Table 3. Sediment Testing Thresholds

Analyte	NOAA Screening[1]		Human RSLs[2]	
	ERL	ERM	Residential	Industrial
Metals (mg/kg)				
Arsenic	8.2	70	0.68	3.0
Cadmium	1.2	9.6	71	980
Chromium	81	370		
Copper	0.234	270	3,100	4,700
Lead	46.7	218	400	800
Mercury	0.15	0.71	1.1	4.6
Nickel	20.9	51.6	150	2,200
Selenium			39	580
Silver	1	3.7	39	580
Zinc	150	410	2,300	35,000
PAHs (µg/kg)				
1-Methylnapthalene			18,000	73,000
2-Methylnapthalene	70	670	24,000	300,000
2,4,5-Trichlorophenol				
2,4,6-Trichlorophenol			44,000	160,000
2,4-Dichlorophenol			180,000	1,800,000
2,4-Dimethylphenol			1,200,000	12,000,000
2,4-Dinitrophenol			120,000	1,200,000
2-Chlorphenol			390,000	5,100,000
Acenaphthene	16	500	360,000	4,500,000
Acenaphthylene	44	640		
Anthracene	85.3	1,100	1,800,000	23,000,000
Benzo(a)anthracene	261	1,600	160	2,900
Benzo(a)pyrene	430	1,600	16	290
Benzo (b) Fluoranthene			160	2,900
Benzo (g,h,i) Perylene				

Analyte	NOAA Screening[1]		Human RSLs[2]	
	ERL	ERM	Residential	Industrial
Benzo (k) Fluoranthene			1,600	29,000
Chrysene	384	2,800	16,000	290,000
Dibenz (a,h) Anthracene	63.4	260	16	290
Fluoranthene	600	5,100	240000	3,000,000
Fluorene	19	540	240000	3,000,000
Indeno (1,2,3-c,d) Pyrene			160	2,900
Naphthalene	160	2,100	3,800	17,000
Pentachlorophenol				
Phenanthrene	240	1,500		
Pyrene	665	2,600	180,000	2,300,000
Total Low Weight PAHs	552	3,160		
Total High Weight PAHs	1,700	9,600		
Total PAHs	4,022	44,792		
Organochlorine Pesticides (µg/kg)				
2,4'-DDD				
2,4'-DDE				
2,4'-DDT				
4,4'-DDD	2	20	2,300	9,600
4,4'-DDE	2.2	27	2,000	9,300
4,4-DDT	1	7	1,900	8,500
Total DDTs	1.58	46.1		
Aldrin			39	180
Alpha-BHC				
Beta-BHC				
Chlordane			1,700	7,500
DCPA (Dacthal)	0.02	8	610,000	6,200,000
Delta-BHC				
Dieldrin			34	140
Endosulfan I			470,000	7,000,000
Endosulfan II				
Endosulfan Sulfate				
Endrin			1,900	25,000
Endrin Aldehyde				
Endrin Ketone				
Gamma-BHC			570	2,500
Heptachlor			130	630
Heptachlor Epoxide			70	330
Methoxychlor			32,000	410,000
Toxaphene			490	2,100

Analyte	NOAA Screening[1]		Human RSLs[2]	
	ERL	ERM	Residential	Industrial
PCB Congeners (µg/kg)				
PCB 018				
PCB 028				
PCB 037				
PCB 044				
PCB 049				
PCB 052				
PCB 066				
PCB 070				
PCB 074				
PCB 077			38	160
PCB 081			12	48
PCB 087				
PCB 099				
PCB 101				
PCB 105			120	490
PCB 110				
PCB 114			120	500
PCB 118			120	490
PCB 119				
PCB 123			120	490
PCB 126			0.036	0.15
PCB 128				
PCB 138				
PCB 149				
PCB 151				
PCB 153				
PCB 156			120	500
PCB 157			120	500
PCB 158				
PCB 167			120	500
PCB 168				
PCB 169			0.12	0.51
PCB 170				
PCB 177				
PCB 180				
PCB 183				
PCB 187				
PCB 189			130	520

Analyte	NOAA Screening[1]		Human RSLs[2]	
	ERL	ERM	Residential	Industrial
PCB 194				
PCB 201				
PCB 206				
Total PCBs	22.7	180	230	970

[1] *Effects Range Low (ERL) and Effects Range Median (ERM) sediment quality objectives from Long et al. (1995).*

[2] *Regional Screening Levels for Chemical Contaminants at Superfund Sites (USEPA Region 9, updated 2017).*

Any exceedances of the ERM and/or RSL values and associated risks to the marine resources and beach users, respectively, will be discussed in the sediment sampling and analysis results section of the PNR. A potential option for source sediment with ERM, but not RSL, exceedance(s) is to place the material only landward of the highest tide line, i.e. out of the water. A potential option for sediment with RSL, but not ERM, exceedance(s) is to place the material only seaward of the low tide line, i.e. not exposed to beach users. If rationale cannot be provided for acceptability of ERM exceedances and if funding is available for further testing, the beach managing entity may wish to proceed with additional biological toxicity testing (described further in following section).

If the source material contains less than 10% fines (silt and clay passing the #200 sieve or less than 0.074 mm in diameter) and has not been exposed to contaminants, it may be possible to avoid the need for chemistry testing. The latter is based on the source site being isolated from sources of contamination or previous testing and information about past land uses at the source location may be utilized to conclude there is no "reason to believe" contaminants are present. Prior to proceeding with the assumption that chemistry testing is not required for an opportunistic source, appropriate regulatory agency staff will be consulted. Typically, if there is little to no historical information on the site, then chemistry testing will be required.

4.2 Optional Biological Toxicity Testing

If the source sediment contains metals and/or pesticides which exceed ERM values and the concentrations are not associated with naturally occurring concentrations, then the beach managing entity may want to consider inclusion of biological toxicity testing to estimate the potential for biologically available contaminants. If the beach managing entity chooses to conduct toxicity testing, bivalve larvae development Suspended Particulate Phase (SPP) toxicity test and amphipod acute Solid Phase (SP) toxicity test (Table 4) are recommended.

Table 4. Biological Toxicity Testing

Test Type	Species	Method	End Points
Suspended Particulate Phase:			
Bivalve larvae	*Mytilus galloprovincialis*	USACE/USEPA, 1998	48 hour
Solid Phase:			
Amphipod	*E. eohastuaius or Ampelisca*	ASTM E1367– 14, USEPA, 1994	10-day survival

4.2.1 Suspended Particulate Phase Testing

The species proposed for SPP testing for this program is the bivalve larvae *Mytilus galloprovincialis.* SPP tests will be performed on sediment elutriates prepared from a composite sample in accordance with ITM (USEPA/USACE, 1998) guidance. One part sediment will be combined with four parts beach receiver site water or marine laboratory reference water and shaken for 30 minutes. The mixture will be allowed to settle for 1 hour, then the liquid and suspended material will be siphoned off with care not to disturb the sediment. The resulting supernatant is considered the 100% SPP. The bivalve water column toxicity test will be conducted with four concentrations of SPP (1, 10, 50, and 100%) prepared with clean filtered seawater. In addition. Each replicate will be inoculated with an equal concentration of bivalve embryos (150 to 300 organisms per chamber) and held for 48 hours. At test termination, organisms will be preserved. The number of alive and normally developed bivalve larvae will be counted. Test conditions are summarized in Table 5.

Test dilutions will be created to calculate dose-response endpoints. Tests will be repeated if control acceptability criteria are not met. The relative sensitivity of each batch of test organisms will be assessed by response to established reference toxicant test. Water quality in the test chambers will be measured daily and include pH, temperature, dissolved oxygen (DO), and salinity.

Test acceptability will be determined by control survivorship/normal development. The results of the SPP acute exposure tests will predict LC_{50}/ EC_{50} values to determine potential lethal/sublethal responses. If no response is observed, then the test material meets the LPC requirements for elutriate concentrations. If responses are observed, then results can be evaluated using the STFATE model to confirm sufficient dilution will occur during placement for the test material to meet LPC requirements for elutriates during placement.

Table 5. Summary of Test Conditions and Acceptability Criteria for the Bivalve Larvae SPP Test

Test Condition	Test Method
Test organism	*Mytilus galloprovincialis*
Test type	Static non-renewal
Test duration	48 hours
Salinity	30-32 ± 2 parts per thousand
Temperature	16 ± 1°C
Light quality	Ambient laboratory
Light intensity	50-100 ft-c
Photoperiod	16 hours light/8 hours dark
Test chamber size	20-mL vials
Test solution volume	10 mL
Water renewal	None
Age of test organisms	Embryo ≤ 4 hours old
Number of organisms per test chamber	150-300
Number of replicate chambers per concentration	5
Number of organisms per concentration	750-1,500
Feeding requirements	None
Test chamber aeration	None
Elutriate preparation water	Site water
Test treatments	Composite samples, laboratory control, and site water control
Dilution series	1, 10, 50, and 100% elutriate
Dilution water	20 µm-filtered seawater, at test salinity
Endpoints	Survival (%) and normal development (%)
Sampling holding requirements	< 8 weeks
Sample volume required	2 L
Test acceptability criteria	≥70% survival and normal development in the laboratory control

Notes:
µm = micrometers
cm = centimeters
ft-c = foot candle
L = liters
mm = millimeters
ppt = parts per thousand

4.2.2 Solid Phase Bioassay Testing

The amphipod *E. eohastuaius or Ampelisca* will be tested to examine acute mortality for potential source sediments. SP testing will follow the ASTM Method E1367-99 (ASTM, 2008) and in *Methods for Assessing the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Amphipods* (USEPA, 1994). Prior to testing, all source sediments will be sieved to remove indigenous organisms.

Water quality parameters including pH, temperature, DO, and salinity will be measured daily during testing. Overlying and interstitial ammonia will be measured at test initiation and termination. At test initiation, five organisms will be placed into each replicate. Test chambers will be randomized and gently aerated during testing. After 10 days, organisms will be sieved from the sediment and survivorship will be recorded. Test acceptability will be evaluated by survivorship in the control, which should be at least 90%. If the test does not meet control acceptability criteria, it should be repeated. The relative sensitivity of each batch of organisms will be assessed by conducting a 96-hour, water-only reference toxicant test using cadmium chloride. The test conditions and suitability criteria based on amphipod survivorship is specified in Table 6.

Table 6. Summary of Test Condition and Acceptability Criteria for Amphipod SP Test

Test organism	*Eohaustorius estuarius*
Test type	Static non-renewal
Test duration	10 days
Temperature	15 ± 1°C
Salinity	30 ± 2 ppt
Light quality	Ambient laboratory
Light intensity	50-100 ft-c
Photoperiod	Continuous
Test chamber size	1-L glass beaker
Seawater volume	Volume to 800 mL
Sediment depth	2 cm
Size of test organisms	3-5 mm
Number of organisms per test chamber	20
Number of replicate chambers per treatment	5
Test solution aeration	Low flow (approximately 100 per minute)
Overlying water	20 µm-filtered seawater (at test salinity)
Test treatments	Composite samples, reference, and control
Endpoint	Percent survival
Sample holding requirements	< 8 weeks
Test acceptability criteria	≥ 90% survival in the control treatment

Notes:
cm = centimeters
ft-c = foot candle
L = liters
mm = millimeters
ppt = parts per thousand

4.3 Grain Size

The USACE guidelines to determine the acceptable grain size content are based on matching the gradation of the receiving beach native sediment within a certain percentage of the source material (Moffatt & Nichol, 2001). The proposed OC SCOUP grain size suitability criteria, as described below, is a modified version of the USACE methodology and is intended to simplify the source sediment suitability determination.

For each source site sample, the percent fine material and percent coarse material will be determined from the laboratory sieve analysis. The percent fine material is the percent passing number for the #200 sieve, i.e. the percentage of the source material with grain sizes smaller than 0.075 mm. The percent coarse material is the percent retained on the #4 sieve, i.e. the percentage of the source material with grain sizes larger than 4.75 mm. Grain size classification is based on the Unified Soil Classification System.

Grain size data is currently available for some of the OC SCOUP receiver beach sites; this data was used to create grain size distribution envelopes (finest and coarsest curves) for each beach and these are provided in Appendix A. For beach receiver sites without existing grain size data, sand samples will be taken at the beach receiver site. As per protocols developed by the USACE (1989), sand samples will be taken along one or more shore-perpendicular transects, at elevations in 6-feet increments along the beach profile from the back beach (+12 ft elevation) out to an offshore distance of water depths of between 20 to 30 feet (e.g. -30 ft elevation). The data from all the samples is compiled to create finest and coarsest curves of the beach receiver site.

For each beach receiver site, the maximum percent fine material and maximum percent coarse material allowed for the source sediment will be determined from the composite finest and coarsest curves. As shown in Figure (example receiver beaches), the maximum percent fine material at a given beach receiver site is the percent passing number at which the receiver site finest curve intersects with the fines limit (#200 sieve or 0.075 mm). The maximum percent coarse material at a given beach receiver site is the percent passing number at which the receiver site coarsest curve intersects with the coarse limit (#4 sieve or 4.75 mm), except as further discussed below for specific receiver beaches with high naturally-occurring cobble.

The maximum percentage fine and coarse material limits for beach receiver sites with existing grain size information is provided in Table 7. (Blank fields indicate that grain size data for the beach receiver site is currently not available). This table, as well as Appendix A, will be updated as additional grain size information becomes available.

In order to determine the source sediment's suitability for a given beach receiver site, the percent coarse and fine material of the source sediment sample are compared to the percent fine and coarse limits of the receiver beach site, respectively.

- For beach berm, storm dike, or backbeach bluff stabilization placement, the percent coarse and fine material of the source sediment sample must be equal to or less than the maximum percent coarse and maximum fine limits of the receiver beach site, respectively.
- For placement below the MHTL or for backbeach dunes, the percent coarse material of the source sediment sample must be less than the maximum percent coarse limits of the receiver beach site and the fines content of the source material may be up to 10% greater than the beach receiver site's maximum percent fines limit.

Some sediment sources (especially those from ocean outlets or riverine channels) may include natural material (non-debris) such as cobble and seashells. Sampling methods do not typically result in these cobble-size particles being in the sediment sample thus it is necessary to define this special criteria for cobble-size particles. Source material with a high cobble content will be allowed for placement only on the following beaches, which have natural shoreline composition containing coarse/cobble material:

- Doheny State Beach
- Capistrano Beach County Park
- Poche Beach County Park
- Capistrano Shores
- North Beach, San Clemente
- Cottons/Trestles

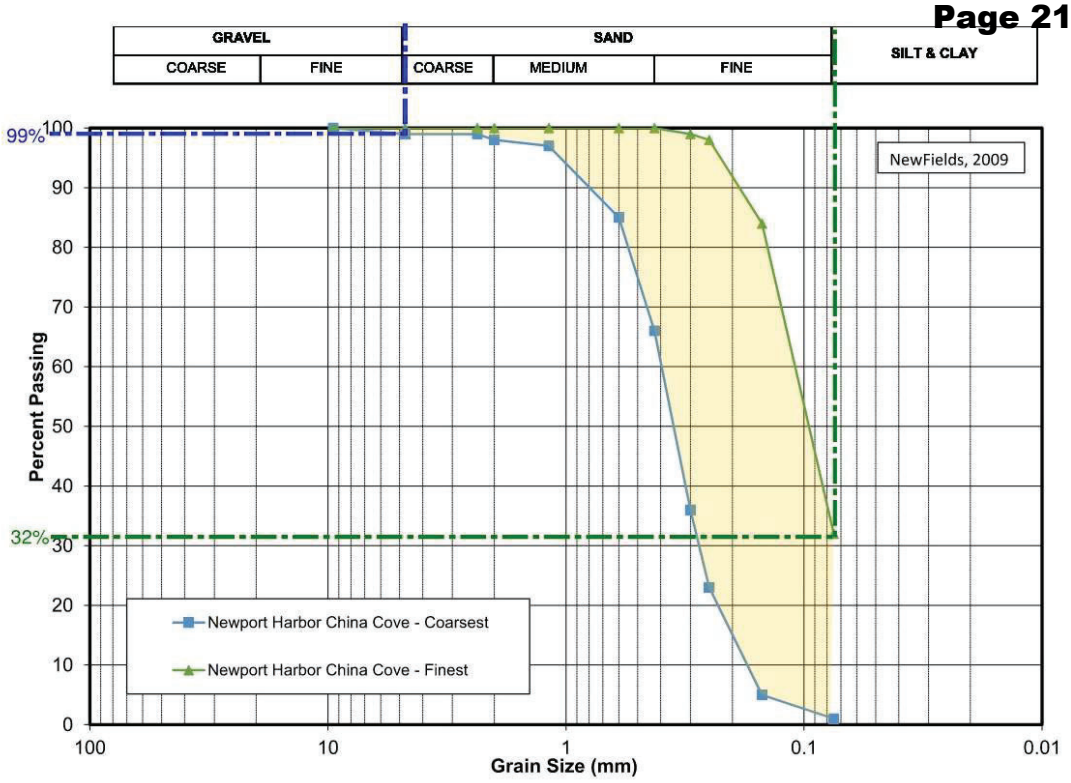
Source material with coarse (cobble/gravel) content will only be acceptable if the particles are cobble (smooth rounded gravel), of approximately the same size as the receiver beach naturally-occurring cobble, and do not constitute greater than approximately 20% of the placed volume. The specific cobble size to be allowed in the source sediment is to be based on the range of natural cobble sizes at the beach receiver site.

4.4 Color

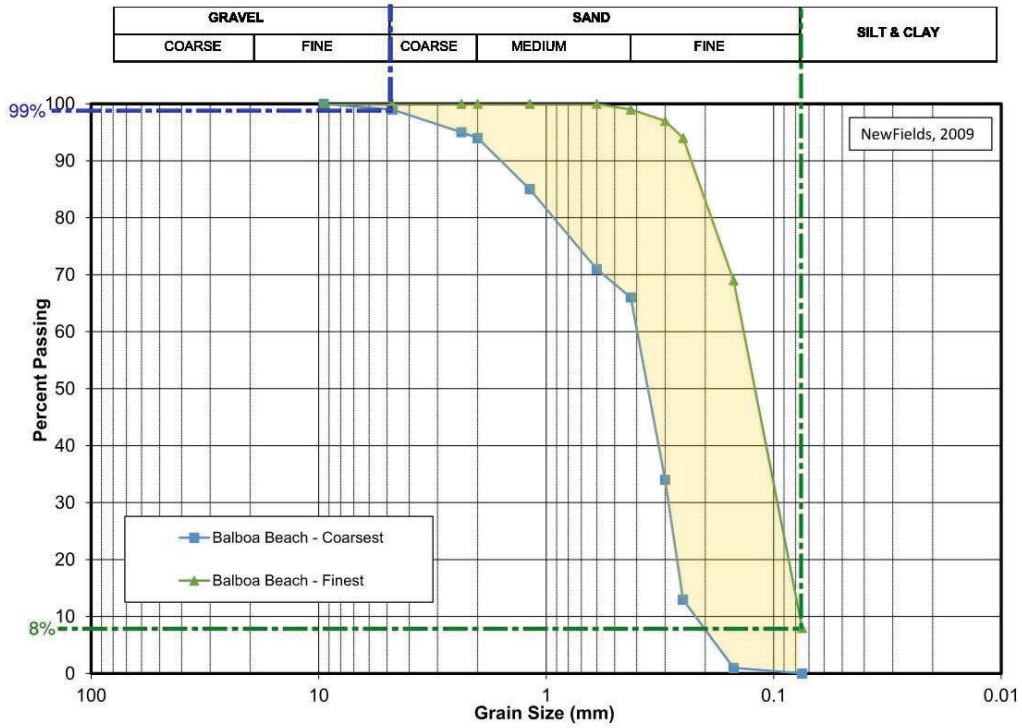
The color of the source material will reasonably match the color of the receiving beach after the placed source material is reworked by waves. Source material which is more significantly off-color could be placed using the MHTL strategy. The receiver beach managing entity will observe the source material in-situ and/or collect a jar of the source material to compare directly with the receiver beach sand. No formal color testing will be performed for the source site material. **Color compatibility will be at the discretion of the receiver beach managing entity (e.g., City).**

4.5 Debris / Organic / Riparian Vegetation Content

Source sand must be free of trash, debris, and significant amounts of organic material (i.e., riparian vegetation typically found in upland material) when placed on the beach. **If debris/organic material (vegetation) is present in the source material, it will be removed prior to excavation (clear and grub) and/or via screening.** The removal can be done by mechanically sifting/screening the material through a coarse mesh to catch debris/vegetation and further reworked, if necessary, using conventional earthmoving equipment. Visual inspection of the source location will be adequate for OCPW and beach receiver managing entities to determine to identify whether screening is required.



In this example, the source material must contain less than or equal to 32% fine material and 1% course material



In this example, the source material must contain less than or equal to 8% fine material and 1% course material

Figure 1. Source Material Grain Size Limits for Example Receiver Site

Table 7. Receiver Sites Grain Size Limits

(Blank fields indicate that grain size data for the beach receiver site is currently not available; this table will be updated as additional grain size information becomes available.)

Receiver Site	Source Sediment Coarse Material Limit (i.e. source sediment coarse content must be equal to or less than this amount)	Source Sediment may include Cobble **?	Source Sediment Fine Material Limit for Beach Berm, Winter Dike and Backbeach Bluff Stabilization Placement (i.e. source sediment fine content must be less than this amount for these three types of beach placement designs)	Source Sediment Fine Material Limit for Below MHTL and Backbeach Dunes Placement (i.e. source sediment fine content must be less than this amount for these two types of beach placement designs)
West Beach, Seal Beach		No		
East Beach, Seal Beach	2%	No	20%	30%
Surfside Beach	0%*	No	37%	47%
Sunset Beach	0%	No	13%	23%
Huntington Harbour Beaches	7%	No	16%	N/A***
Bolsa Chica State Beach		No		
Huntington Beach Bluffs		No		
Huntington Beach State Beach		No		
West Newport Beach	1%	No	34%	44%
Balboa Beach	1%	No	8%	18%
Newport Harbor – China Cove	1%	No	32%	N/A
Newport Harbor – Marina Park		No		
Newport Dunes		No		N/A
Corona del Mar Beach		No		
Little Corona del Mar Beach		No		N/A
Crystal Cove State Park (Moro Beach only)	0%	No	0%	N/A
Salt Creek Beach		No		
Baby Beach, Dana Point Harbor	4%	No	1%	N/A
Doheny State Beach		Yes		
Capistrano Beach County Park	39%	Yes	45%	55%
Poche Beach		Yes		N/A
Capistrano Shores	34%	Yes	34%	N/A
San Clemente North Beach	34%	Yes	34%	44%
San Clemente Central Beaches	4%	No	52%	62%
San Clemente State Beach	5%	No	32%	42%
Cyprus Shore/Cottons	5%	Yes	65%	75%

**A 0% coarse limit means that the source material cannot contain any grain size greater than 4.75 mm (~0.2 inch).*

*** Cobble is defined as grain size of 64-256 mm (2.5-10 inches); for this OC SCOUP, the specific cobble size to be allowed in the source sediment is to be based on the range of natural cobble sizes at the beach receiver site.*

**** Not Applicable, meaning the beach receiver site will not have either a dune or below MHTL sand placement design.*

4.6 Compactability/Moldability

Material with the tendency to form a hardpan (visible component of iron oxides, brown/red color) will only be placed seaward of the MHTL to be reworked by waves. Reworking by waves will result in rapid winnowing of fines from the beach fill, leaving beach sand behind while fines are transported away from the site by currents. It should be noted that hardpan source material would likely not meet grain size criteria.

4.7 Caulerpa Content

As a result of the 2021 Caulerpa outbreak in Newport Bay, **source sediments from the Newport Bay marine environment will need to adhere to the guidelines set forth in the Caulerpa Control Protocol (NMFS, 2021) prior to placement on beaches**. This includes monitoring and reporting requirements as well as coordination with the relevant regulatory agencies.

Aside from Newport Bay, Caulerpa has not been observed at any other potential source or receiver sites specified in this program. Therefore, Caulerpa is not anticipated to be an issue except at Newport Bay as of the time of writing this report. When Caulerpa is successfully eradicated from Newport Bay, and it transitions from an "Infected System" into a "Caulerpa-Free System" per the requirements specified in the Caulerpa Control Protocol, the necessity for Caulerpa monitoring may no longer be necessary. The status of Newport Bay should be monitored, and this section should be revisited at a later date accordingly.

5 Sediment Sampling and Analysis Results Reporting

The following will be provided in the Project Notification Report Section 2:

A. Source Site Overview:

- Briefly explain the activity which has resulted in the sediment opportunity.
- Map/figure and text description of the source site location and surrounding areas.
- Expected variation in sediment characteristics (grain size) within the excavation area.
- Source site excavation information in a table:

Size of Excavation Area (acres or sq ft)	Estimated Excavation Cut Depth (ft)	Estimated Quantity of Material to be Excavated and Used for Beach Nourishment (cubic yards)	Method of Excavation

B. Source Site History:

- Source site map which show locations of nearby storm drain outfalls, stream/river outlets, and/or existing/past commercial activities or other potential sources of pollution.
- State if source site is downstream of a major point sources of pollution and/or in fouling, stagnant, or long ponded area.
- Summarize historical and current activities, surrounding land use, any historical contamination or spills cleanup, any Clean Water Act 303(d) listings, etc., which could affect the material characteristics or quality at the excavation and/or placement sites.
- Include summary of results of any previous sediment characterization studies.

C. Sampling Team and Sampling Equipment:

- Names of the sampling team members and their roles (sampling and design lead, testing laboratory(ies).
- Description of the equipment used to collect the samples.

D. Sampling Design:

- Map of the sampling locations and composite area(s), relative to excavation footprint.
- Table including core sample locations and depths of each sample.

Composite Area	Station ID	Latitude	Longitude	Ground Surface Elevation (ft)	Design Cut Elevation (ft)	Core Length (ft)

E. Source Sediment Testing and Analysis Results:

- Photographs of source sediment sample cores
- Chemical testing results:

- Results for each source sediment sample and/or composite for each of the attributes listed in Table 2 and highlighting any exceedances of ERLs/ERMs
- For any exceedance of ERLs/ERMs, rationale if appropriate for why source material is still suitable for beach placement, as described in criteria above.

- Biological toxicity testing results, if applicable:
  - Results for each source sediment sample and/or composite for each of the two biological toxicity tests
- Physical testing results:
  - Grain size distribution graph for each source sediment sample and/or composite,
  - Percent fine material (passing #200 sieve or smaller than 0.074 mm)
  - Percent coarse material, e.g. gravel (retained on the #4 sieve or larger than 4.75 mm)
  - Source sediment gradation test results compared with the proposed beach receiver site(s) specifications (Table 7)
- Laboratory reports for physical and chemical testing, and biological toxicity testing if required, including QA/QC reports, as an appendix.

F. Source Material Cobble Content

- Describe amount and sizes of coble present in source material, in comparison to the beach receiver site.

G. Source Material Debris and Organic/Vegetation Content

- Describe debris and organic/vegetation material present in source material, if any.
- State if screening of the source material is required

H. Source Material Potential for Compactability/Moldability

- State if the source material is likely to form hardpan when placed on the beach.

I. Source Material Caulerpa Content

- State if the source material is from Newport Harbor

J. Source Material Suitability Summary

- Complete summary table in PNR template
- Summarize why source material is suitable for beach placement.

6 References

ASTM, 1999. *ASTM Standards in Building Codes.* American Society for Testing Materials.

ASTM, 2008. *Standard Test Method for Measuring the Toxicity of Sediment-Associated Contaminants with Estuarine and Marine Invertebrates*. American Society for Testing and Materials, Philadelphia Pennsylvania. ASTM Method E1367-03.

Long, E. R., D. D. MacDonald, S. L. Smith, and F. D. Calder. 1995. *Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments*. Environmental Management 19(1): 81-97.

USACE/USEPA, 2021. *Sampling and Analysis Plan/Results (SAP/R) Guidelines (SAPRG)*, Revised: U.S. Army Corps of Engineers Los Angeles District and U.S. Environmental Protection Agency Region 9. July 1, 2021.

USEPA, 1994. *Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods*. June 1994. Environmental Protection Agency, Office of Research and Development. EPA 600/R-94/025.

USEPA, 2025. USEPA website: *Regional Screening Levels (RSLs) | US EPA*

USEPA/USACE, 1998. *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S., Inland Testing Manual (ITM)*. USEPA/USACE 1998.

APPENDIX A.3
Existing Biological Resources Maps
(Merkel, 2025a)


0 500 1,000
Feet
West Seal Beach
East Seal Beach
Maximum Potential Fill Extent Over Multiple Events
Snowy Plover Nesting/Wintering
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate

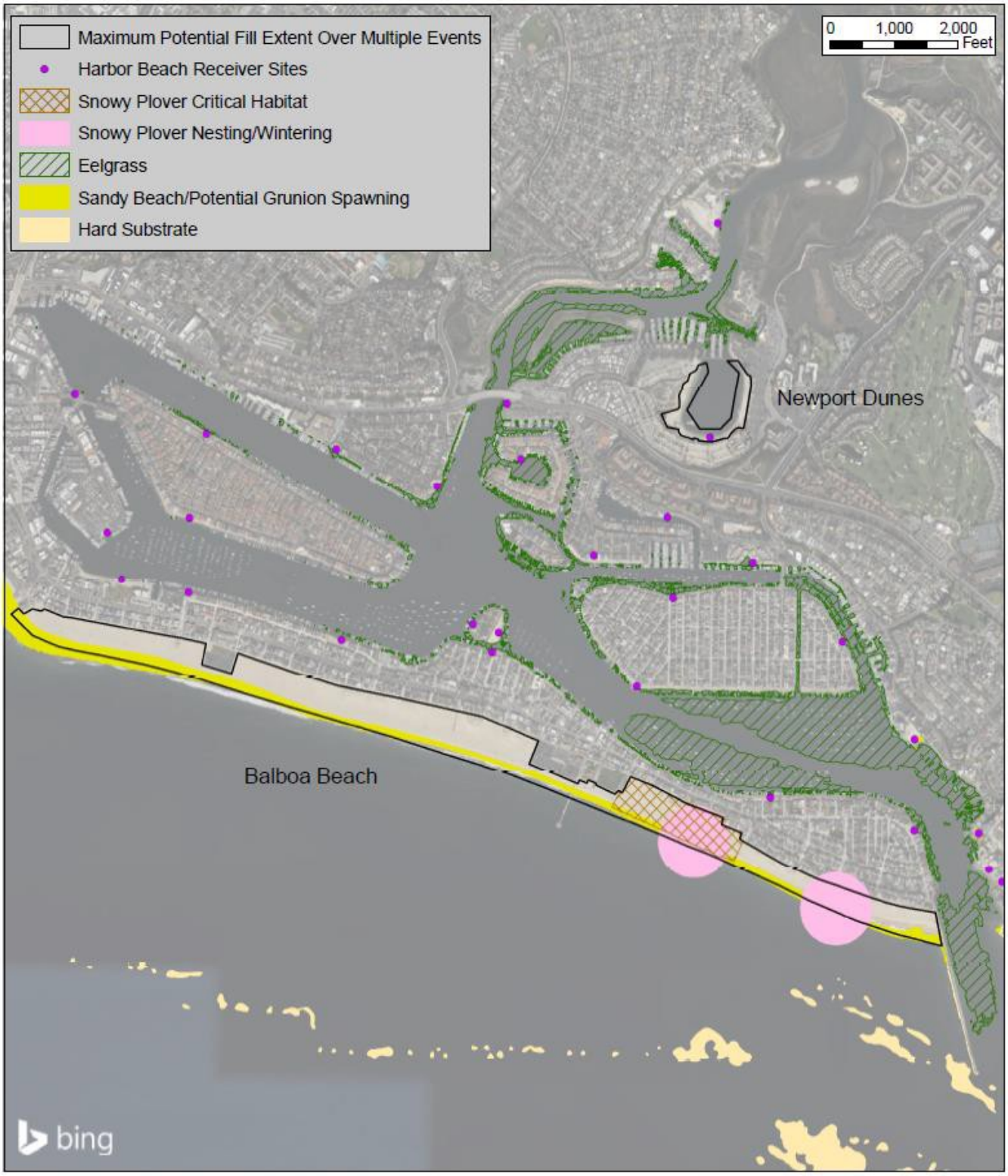

0 500 1,000
Feet
Surfside Beach
Sunset Beach
Maximum Potential Fill Extent Over Multiple Events
Harbor Beach Receiver Sites
Snowy Plover Critical Habitat
Snowy Plover Nesting/Wintering
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate

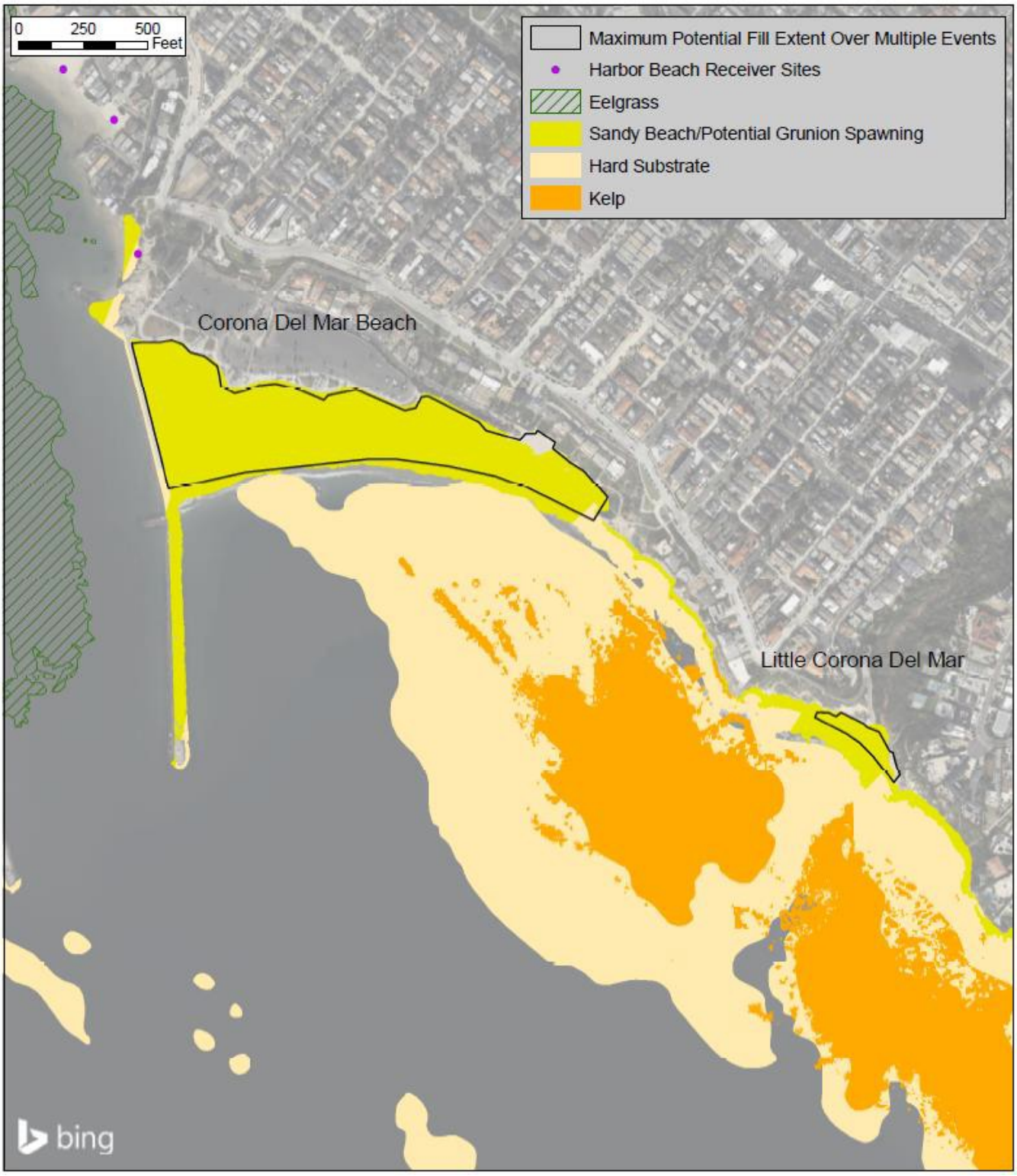

0
750
1,500
Feet
Bolsa Chica State Beach
Maximum Potential Fill Extent Over Multiple Events
Snowy Plover Critical Habitat
Snowy Plover Nesting/Wintering
Least Tern Nesting
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate

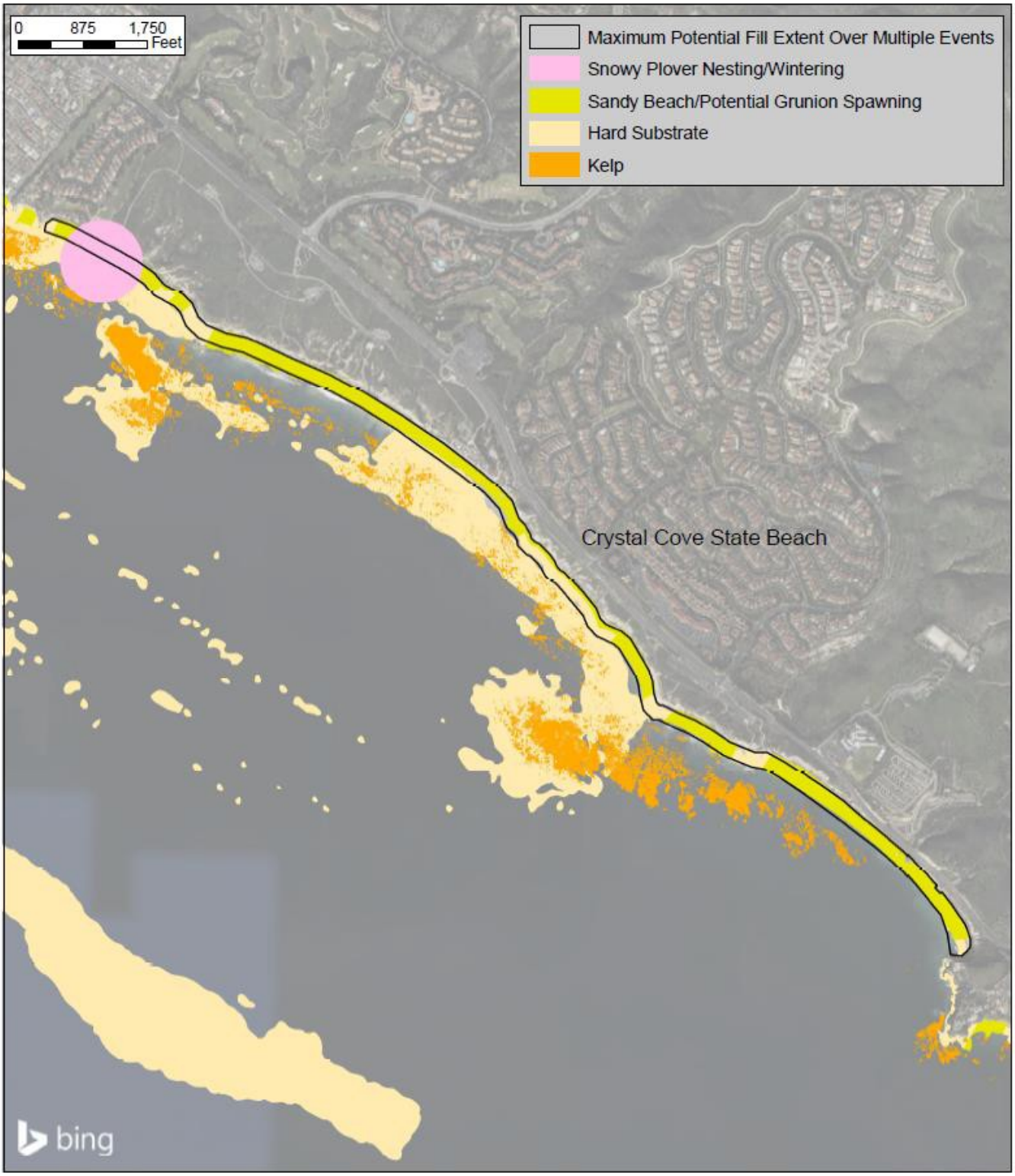

Maximum Potential Fill Extent Over Multiple Events
Snowy Plover Critical Habitat
Snowy Plover Nesting/Wintering
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate
HuntingtonBeach Bluffs
0
500
1,000
Feet

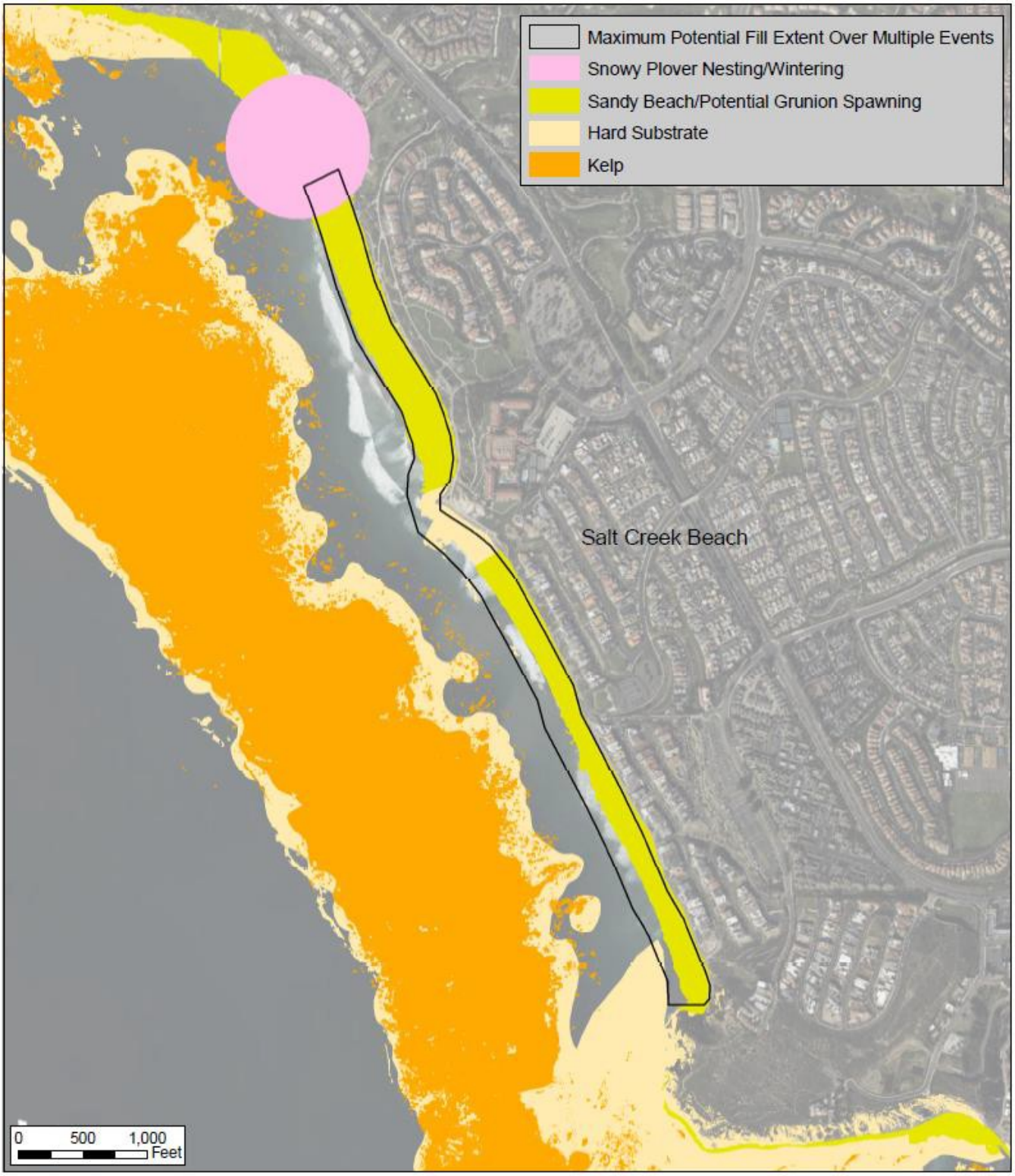

0 750 1,500
Feet
Huntington Beach State Beach
Maximum Potential Fill Extent Over Multiple Events
Snowy Plover Critical Habitat
Snowy Plover Nesting/Wintering
Least Tern Nesting/Snowy Plover Nesting/Wintering
Least Tern Nesting
Sandy Beach/Potential Grunion Spawning
Hard Substrate

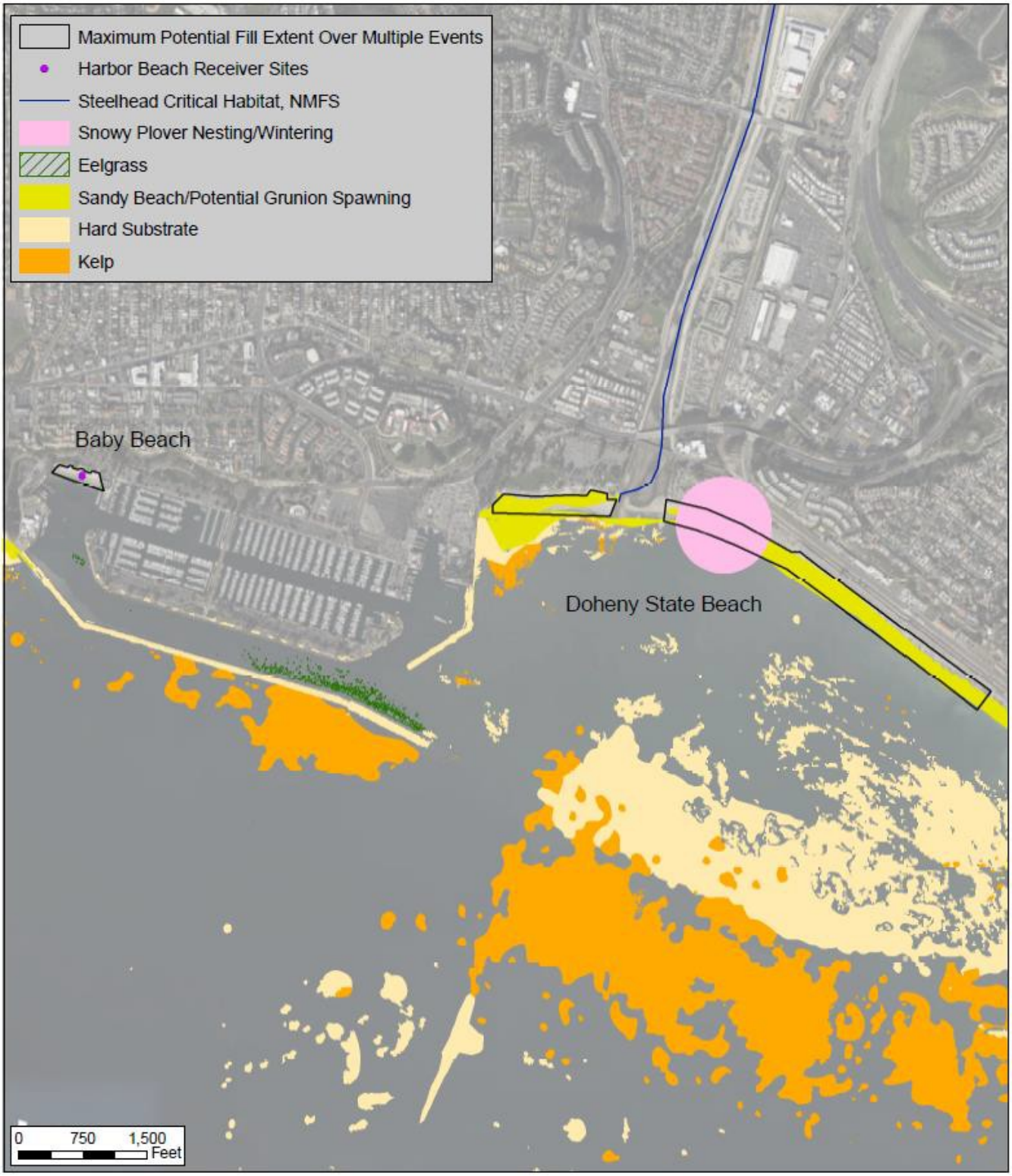

0 750 1,500
Feet
West Newport Beach
Maximum Potential Fill Extent Over Multiple Events
Harbor Beach Receiver Sites
Snowy Plover Critical Habitat
Snowy Plover Nesting/Wintering
Least Tern Nesting/Snowy Plover Nesting/Wintering
Least Tern Nesting
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate

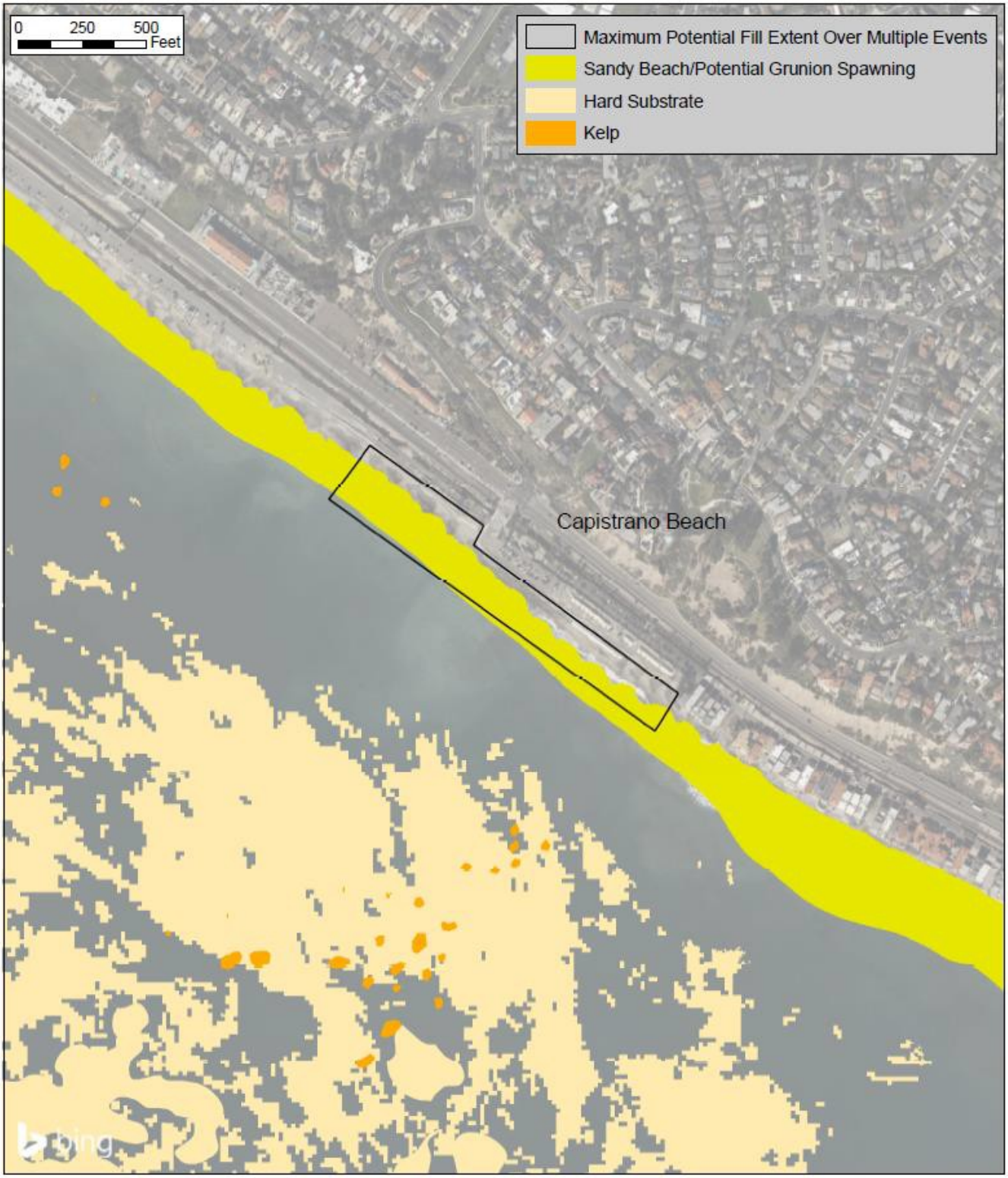

Maximum Potential Fill Extent Over Multiple Events
Harbor Beach Receiver Sites
Snowy Plover Critical Habitat
Snowy Plover Nesting/Wintering
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate
0 1,000 2,000
Feet
Newport Dunes
Balboa Beach
bing


0 250 500
Feet
Maximum Potential Fill Extent Over Multiple Events
Harbor Beach Receiver Sites
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Corona Del Mar Beach
Little Corona Del Mar
bing


0 875 1,750
Feet
Maximum Potential Fill Extent Over Multiple Events
Snowy Plover Nesting/Wintering
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Crystal Cove State Beach
bing


Maximum Potential Fill Extent Over Multiple Events
Snowy Plover Nesting/Wintering
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Salt Creek Beach
0
500
1,000
Feet


Maximum Potential Fill Extent Over Multiple Events
Harbor Beach Receiver Sites
Steelhead Critical Habitat, NMFS
Snowy Plover Nesting/Wintering
Eelgrass
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Baby Beach
Doheny State Beach
0
750
1,500
Feet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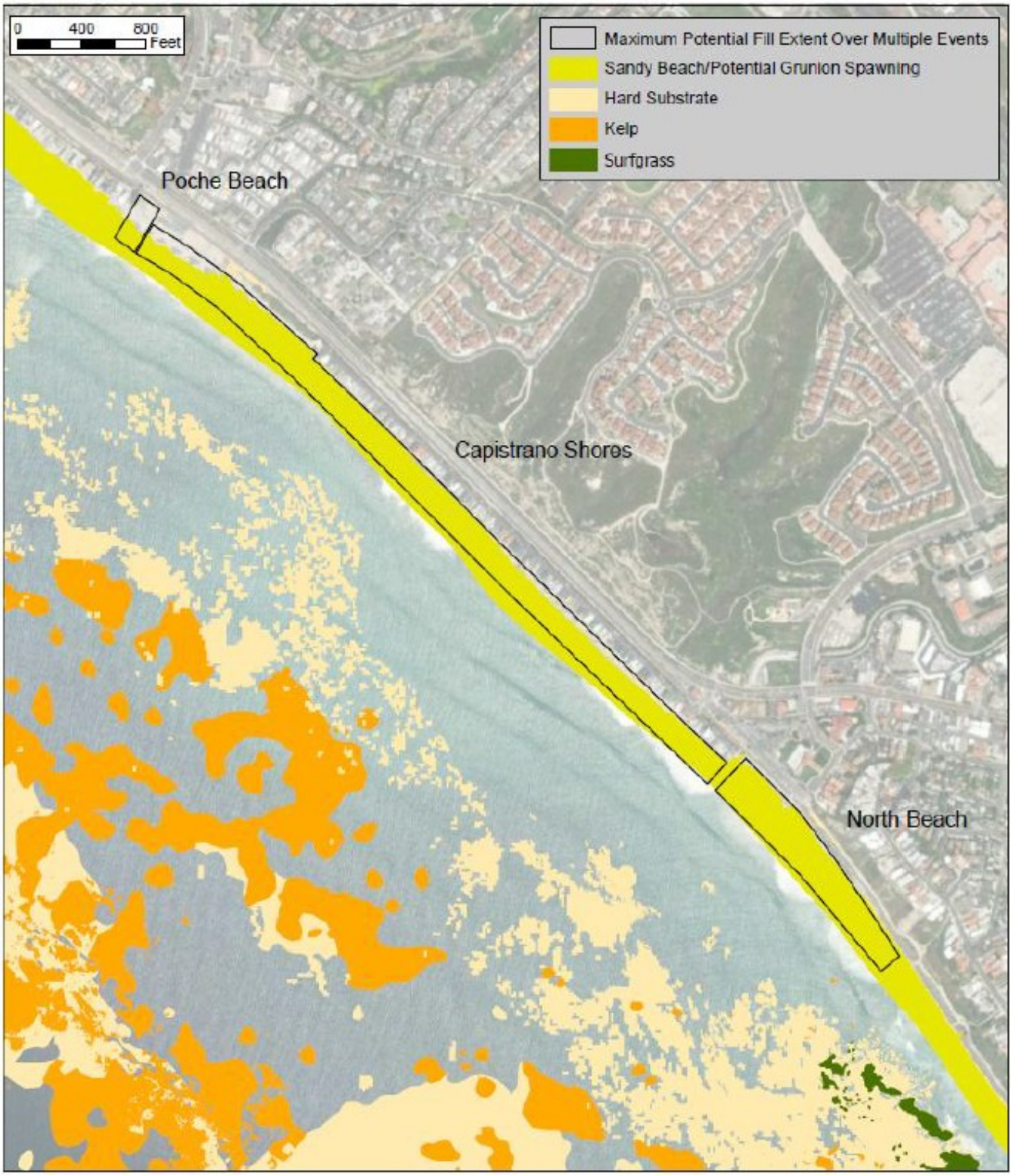
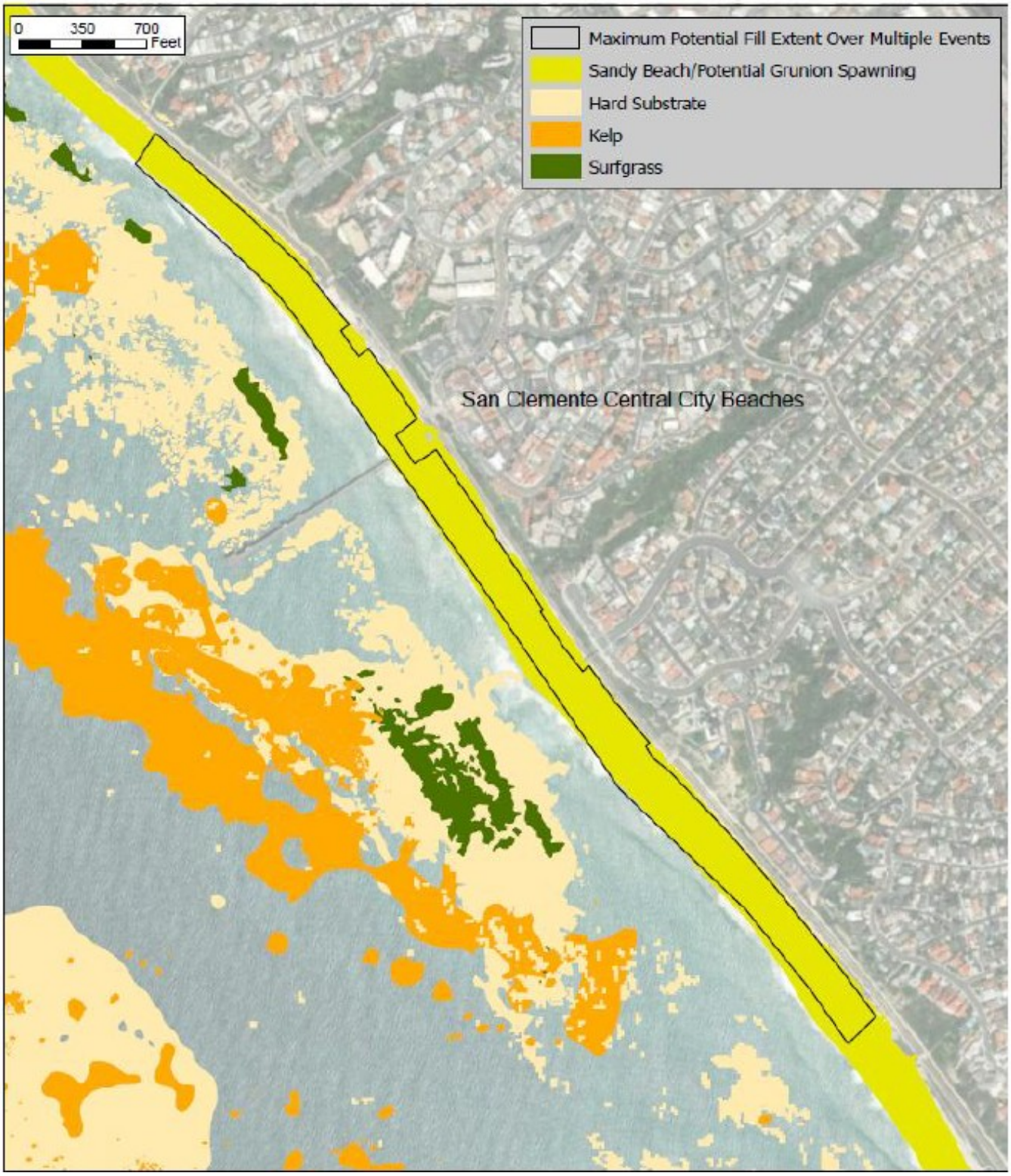
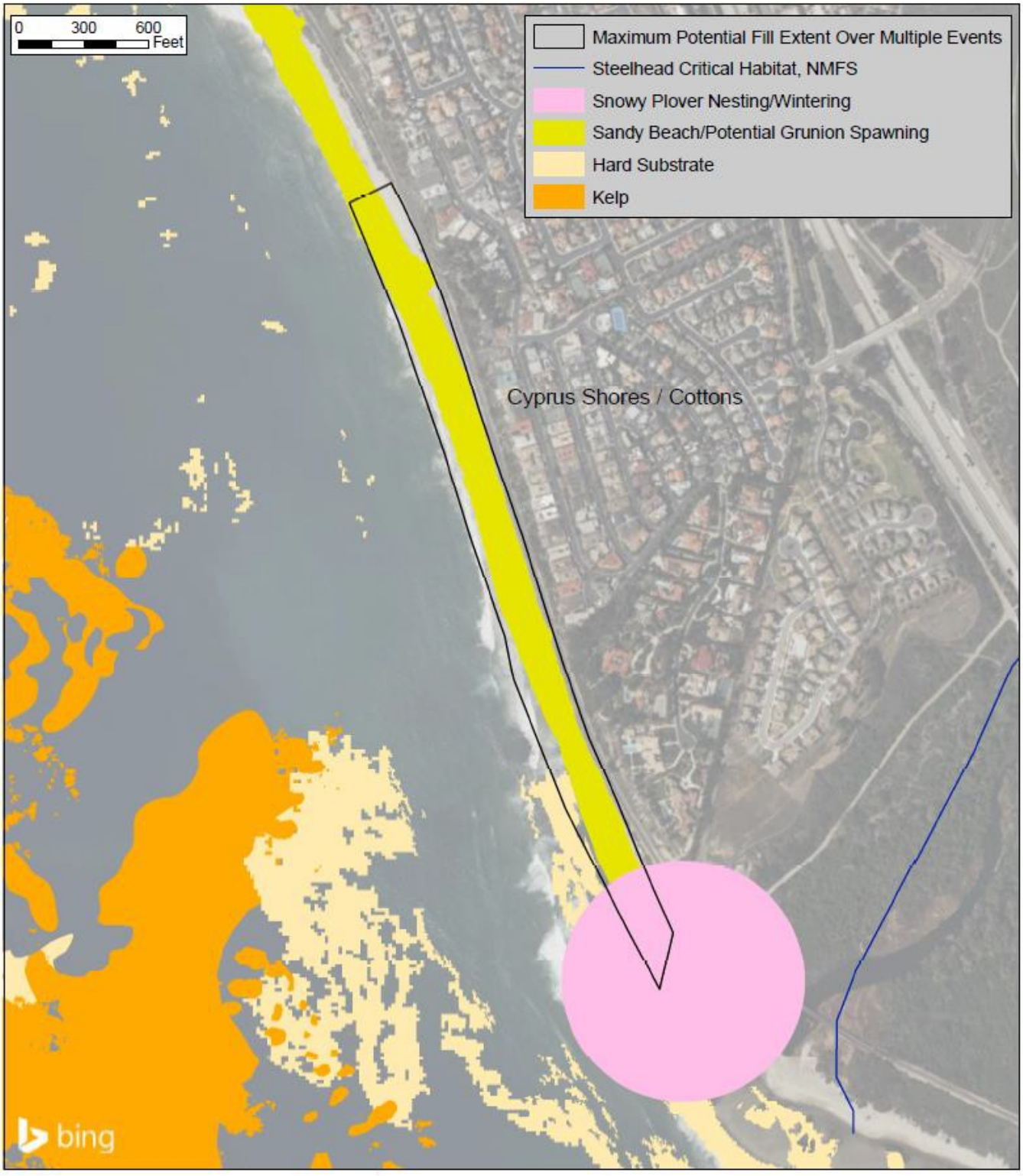
Feet
Maximum Potential Fill Extent Over Multiple Events
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Capistrano Beach


0 400 800
Feet
Maximum Potential Fill Extent Over Multiple Events
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Surfgrass
Poche Beach
Capistrano Shores
North Beach


0 350 700
Feet
Maximum Potential Fill Extent Over Multiple Events
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Surfgrass
San Clemente Central City Beaches


0 350 700
Feet
Maximum Potential Fill Extent Over Multiple Events
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
San Clemente State Beach
bing


0 300 600
Feet
Maximum Potential Fill Extent Over Multiple Events
Steelhead Critical Habitat, NMFS
Snowy Plover Nesting/Wintering
Sandy Beach/Potential Grunion Spawning
Hard Substrate
Kelp
Cyprus Shores / Cottons
bing

APPENDIX A.4
Project Notification Report Template

TEMPLATE

Project Notification Report -

Orange County
Sand Compatibility and Opportunistic Use Program (OC SCOUP)

Sediment Source Site:

INSERT NAME/LOCATION HERE

Beach Receiver Site(s):

INSERT NAME/LOCATION HERE

Prepared by:

INSERT CONTACT INFORMATION FOR SUBMITTER (RESPONSIBLE PUBLIC AGENCY) HERE

(agency name and point of contact name, address, email, and telephone number)

Date: **INSERT DATE**

Exhibit 9
Page 3 of 10

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2.4 Sampling Design 2
2.5 Sediment Testing and Analysis Results 2
2.6 Source Material Cobble Content 2
2.7 Source Material Debris and Organics/Vegetation Content 2
2.8 Source Material Potential for Compactability/Moldability 2
2.9 Source Material Caulerpa Content 2
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3.3 Beach Placement Design 4
3.4 Beach Placement Method 4
3.5 Public Access Plan 4
3.6 Construction Contractor Information 4
4 Public Notification Process 5
5 Monitoring 6
6 Post-Project Reporting 7

1 Introduction

Include the following:

- Completed Table 1;
- Briefly describe the importance of the project, i.e. why the specific receiver beach needs nourishment, including photographs of the beach receiver site's existing conditions; and
- Roles and responsibilities for each aspect of the project, including the source sediment sampling and analysis.
- Planview figure showing this event's sand placement footprint relative to the proposed beach receiver site's maximum potential fill envelope as defined in the Implementation Guidelines.

Table 1: Proposed Project

Sediment Source Site (and Stockpile Site if Applicable)	Beach Receiver Site (Location of Proposed Beach Nourishment)	Maximum Annual Fill Volume for this Receiver Site, from Implementation Guidelines (cubic yards)	Sand Placed at this Receiver Site in the Past 12 Months or Anticipated to Occur within the Next 12 Months*, under OC SCOUP and/or any other project (cubic yards)	Total Proposed Volume of Sand to be Placed for this Project/Event (cubic yards)	Estimated Volume of Sand to be Placed Within USACE Jurisdiction** for this Project/Event (cubic yards)	Proposed Sand Placement Location(s) (berm, dike, below MHTL, backbeach dunes, backbeach bluff stabilization)

* Include the date, location, and volume placed (to be placed) and the project proponent/contact information for the past and/or anticipated future event. The proposed sand placement volume, when combined with all other recent or anticipated sand placement activities at the proposed receiver site shall not exceed the maximum annual volume limit for the proposed receiver site as specified in the Implementation Guidelines.

** Estimated volume to be placed seaward of the highest tide line (7.1 ft relative to MLLW datum), which is the USACE jurisdictional boundary for the Clean Water Act Section 404.

2 Source Sediment

2.1 Source Site Overview

Provide the source site overview as defined in Section 5 of the OC SCOUP Programmatic SAP.

2.2 Source Site History

Provide the source site history as defined in Section 5 of the OC SCOUP Programmatic SAP.

2.3 Sampling Team and Sampling Equipment

Provide the sampling team and equipment information as defined in Section 5 of the OC SCOUP Programmatic SAP.

2.4 Sampling Design

Provide the source material sampling design, as listed in Section 5 of the OC SCOUP Programmatic SAP.

2.5 Sediment Testing and Analysis Results

Provide the source material sampling design and physical and chemical testing results, as listed in Section 5 of the OC SCOUP Programmatic SAP.

2.6 Source Material Cobble Content

Describe any cobble/gravel content in the source material, in comparison to the beach receiver site. Identify if the cobble/gravel will be removed prior to beach placement.

2.7 Source Material Debris and Organics/Vegetation Content

Describe general content of material with regard to debris and vegetation. This will include a description of the kinds of debris and vegetation found in the source material, methods for screening, separating, and/or retrieving the debris/unsuitable material, and disposal methods.

2.8 Source Material Potential for Compactability/Moldability

Describe potential for source material to form hardpan.

2.9 Source Material Caulerpa Content

Describe potential for source material to contain invasive Caulerpa.

2.10 Source Material Suitability Summary

Complete Table 2 on following page. Provide rationale for suitability of the source material for placement on the proposed receiver site.

*Table 2: Source Material Suitability**

Source Sediment Chemistry – Are all Analytes Less Than ERMs and RSLs?	Grain Size Compatibility					Does the Source Material Include Cobble and/or Seashells? If So, What is the Approx % Content?	Can Receiver Site Accept Source Material with Cobble (per SAP)?	Does the Color of the Source Material Generally Match the Receiver Site Sand Color?	Is the Source Material Free of Excessive Organics/ Veg/Debris or Will Debris/ Organics/ Vegetation be Removed from the Source Material?	Does the Source Material Have the Potential to Form Hardpan After Placement on the Beach?	Is the Source Material from a Marine Area with the Potential to Include Caulerpa?
	Source Sediment Percent Fine Material, (List for Each Sample) (%)	Receiver Site Fine Material Limit for Beach Berm, Winter Dike, and Backbeach Bluffs Stabilization (%)	Receiver Site Fine Material Limit for Below MHTL and Backbeach Dunes Placement (%)	Source Sediment Percent Coarse Material (List for Each Sample) (%)	Receiver Site Coarse Material Limit (%)						

* If all of the answers to the questions in this table are "yes" or "not applicable," then the source material is suitable for beach placement.

3 Transportation and Placement

3.1 Receiver Site Placement Timing

Describe the timing and overall schedule for the sand placement, e.g. approximate start date and duration.

3.2 Transportation Method

Describe how the source sediment will get to the beach receiver site, e.g. truck, rail. Provide an approximation of how many trucks will be required (total and daily).

3.3 Beach Placement Design

Provide planview of the sand placement, including an annotated aerial photograph showing the extent of sand placement relative to the highest tide line (7.1 ft relative to MLLW datum) and Mean High Water line (+4.7 ft MLLW), the Clean Water Act Section 404 and Rivers and Harbors Act Section 10 jurisdictional boundaries, respectively, and the associated estimated acreage and linear feet of sand placement within these USACE jurisdictions. If available, provide cross-section drawing(s) of the sand placement design.

3.4 Beach Placement Method

Describe the sand placement method, including equipment, staging area(s), and construction equipment/vehicle beach accessway(s) and on-beach haul routes.

3.5 Public Access Plan

Describe any public parking affected. List any public access closures or restrictions. Describe methods (including signs, fencing, posting of security guards, etc.) by which safe public access to or around the sand deposition sites and/or staging areas shall be maintained during all sand deposition operations. Where public paths or bikeways are proposed to be closed during active operations, a person(s) shall be on-site to detour/direct traffic. Where use of public parking spaces is unavoidable, the minimum number of public parking spaces that are required for the staging of equipment, machinery and employee parking shall be used. Staging, stockpile, and construction areas shall be clearly demarcated and used in a manner that preserves the maximum amount of public beach access parking and restores the staging/stockpile areas back to public parking immediately after the conclusion of the sand placement project.

3.6 Construction Contractor Information

Include Contractor name, address, contact information, etc., if available.

4 Public Notification Process

Describe how the public is being notified of this specific beach nourishment event. At a minimum, a sign will be placed at the placement site indicating the project scope, expected dates of construction, and/or beach closure, at least 1-2 weeks prior to placement. For sand placement events longer than two months, provide notification in local newspapers and on County or local City websites.

5 Monitoring

This section will describe monitoring to be performed based on the trigger criteria in the Implementation Guidelines document. It will also describe reporting timelines for monitoring results.

6 Post-Project Reporting

The (name of public agency) agrees to comply with the post-project reporting required by the regulatory agency permits.

Table 5-3. Sensitive Biological Resources in the Vicinity of Receiver Sites

Receiver Site	Reef	Kelp	Seagrass	Grunion	Least Tern	Snowy Plover	MPA	Previous Nourishment
West Beach, Seal Beach				X		O	No	No
East Beach, Seal Beach				X		O	No	Yes
Surfside Beach				X		O	No	Yes
Sunset Beach				X		O	No	Yes
Huntington Harbour Beaches			EG				No	Yes
Bolsa Chica State Beach				X		N, O	No	Yes
Huntington Beach Bluffs	D			X		O	No	Yes
Huntington Beach State Beach				X	N	N, O	No	Yes
West Newport Beach	C			X		O	No	Yes
Balboa Beach	D			X		O	No	Yes
Newport Harbor Beaches			EG				No	Yes
Newport Dunes			EG				Yes	Yes
Corona Del Mar State Beach	A	C	SG	X			Yes	Yes
Little Corona del Mar	A	B	SG	X			Yes	Yes
Crystal Cove State Park	A	B	SG	X		O	Yes	Yes
Salt Creek Beach	B	C	SG	X		O	Yes	No
Baby Beach			EG				No	Yes
Doheny State Beach	A	B		X		O	No	Yes
Capistrano Beach County Park	C	C	SG	X			No	Yes
Poche Beach	C	D	SG	X			No	Yes
Capistrano Shores	C	D		X			No	Yes
San Clemente North Beach	C	D	SG	X			No	Yes
San Clemente City Beaches	B	D	SG	X			No	Yes
San Clemente State Beach	C	C	SG	X			No	No
Cyprus Shore/Cottons Beach	A	C	SG	X		O	No	No

Sources: Everest 2013; Chambers Group 2016, MarineBIOS 2024; EcoAtlas 2024; City of Newport Beach 2022; M&A 2013-2023 (Anaheim Bay, Huntington Harbour, Bolsa Chica, Dana Harbor); Ryan et al. 2017; Ryan et al. 2023. Notes: Distance: A - less than 100 ft; B - 100-300 ft offshore; C - 300-1,000 ft offshore; D – more than 1,000 ft offshore; X = Present or potentially present; N – Nesting; O = Overwintering/Roosting; EG – Eelgrass; SG - Surfgrass

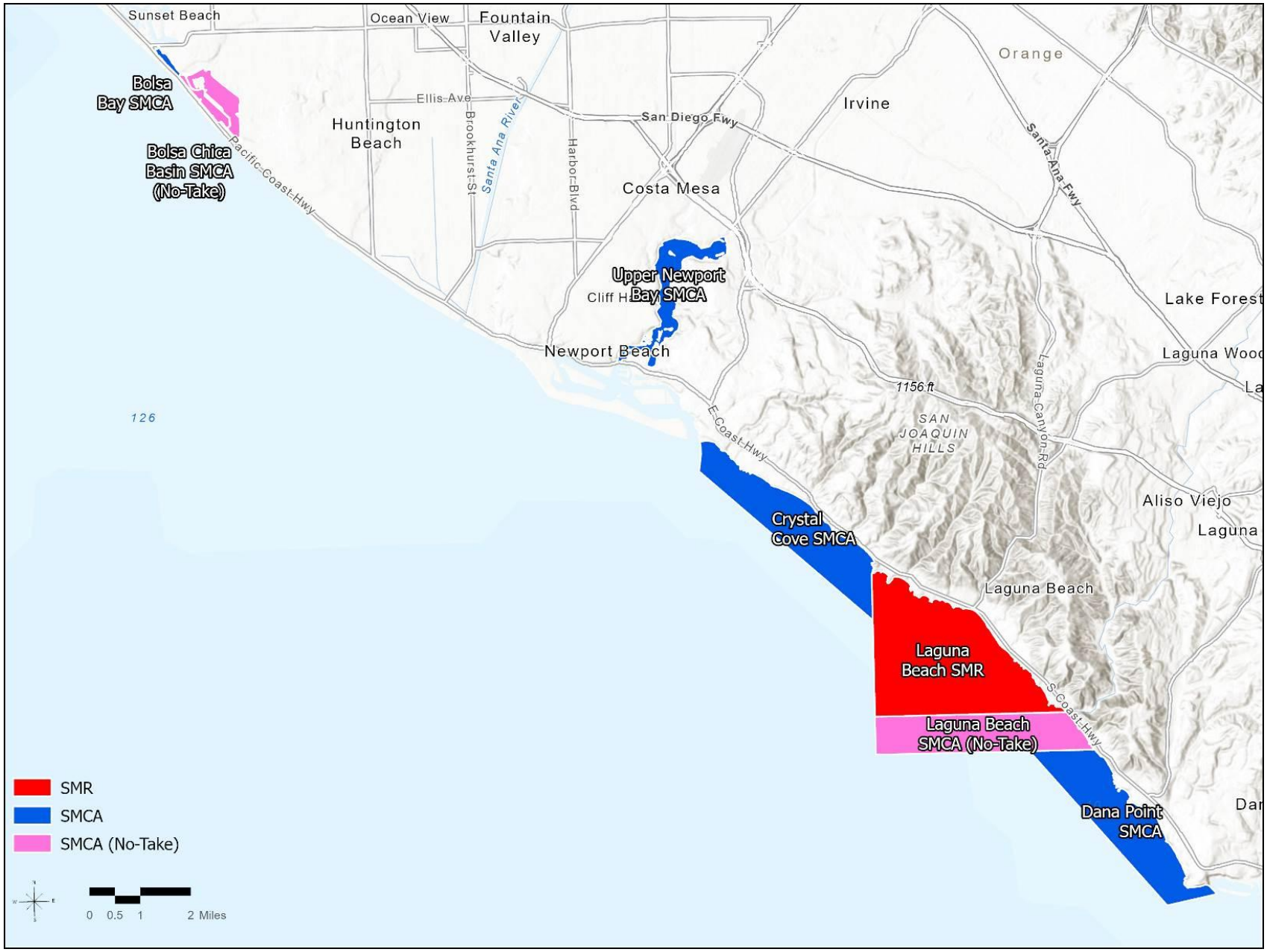

Figure 2-6 Marine Protected Areas Located in Orange County

Exhibit 10
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Table 4-1: Mitigation, Monitoring, and Reporting Program

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
PGM BIO-1	At the stockpile site OC.S.4 (Audubon Basin), in order to avoid impacts to paniculate tarplant, a sensitive species, a survey will be performed by a qualified biologist prior to any sand storage. If found, any paniculate tarplant will be fenced off with ribbon or yellow rope and t-posts and stockpiling and construction activities should be avoided in the fenced-off area.	Survey results submitted to Construction Manager and agency file	Audubon Basin, (OC.S.3)	Pre-construction	Site managing entity (i.e., County of Orange)			
MM BIO-1	At stockpile sites, to avoid direct impacts to migratory birds and/or raptor active nests protected under the federal MBTA and CFG Code Sections 3503 and 3513, removal of stockpiled material that supports active nests within The Program's impact area should occur outside of the breeding season for applicable species, as far as is reasonably feasible. Where removal during the nesting season is unavoidable, a suitably qualified biologist will conduct nesting bird surveys prior to commencement. If nesting birds are identified, the biologist will implement a suitable buffer zone around the nest(s) and a biological monitor would be on site daily to ensure that adverse impacts to the sensitive resource do not occur.	Survey report before work begins; weekly monitoring reports if nests present	All stockpile sites	During construction if occurring during breeding season for applicable species (typically January 15-September 15); Surveys to be conducted within 3 days prior to construction if required	Site and Stockpile managing entity (i.e., County of Orange, CA State Parks, City of Huntington Beach, City of Newport Beach, and City of San Clemente, City of Irvine)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
PGM BIO-2	Sensitive bird species monitoring will be implemented if sand placement is anticipated to occur during the California least tern or Western snowy plover nesting seasons on beach receiver sites with the potential for least tern or snowy plover nesting. Sensitive bird species monitoring will also occur if sand placement will occur during the snowy plover overwintering season on beach receiver sites with the potential for snowy plover overwintering. The monitoring protocol will be approved by the applicable regulatory agencies prior to permit issuance. The protocol is anticipated to include pre-construction surveys, recurring surveys, the establishment of buffers, and the authority to halt work to avoid or minimize impacts.	Monitoring logs and any stop-work notices to entity	Snowy plover monitoring: Bolsa Chica State Beach (CA.1), Huntington State Beach (CA.2), Crystal Cove State Park (CA.3), Doheny State Beach (CA.4), Salt Creek Beach (OC.2), Sunset Beach (HB.1), West Newport Beach (NB.1), Balboa Beach (NB.3), Cyprus Shore/Cottons (SC.4), West Beach (SB.1), East Beach (SB.2), and Surfside Beach (SB.3) Least tern monitoring: Huntington State Beach (CA.2)	Pre-construction and during construction Snowy plover and least tern nesting season: spring/summer months (Feb 1-Sept 15) Snowy plover overwintering season: fall/winter months (Sept 16-Jan 31)	Site managing entity (i.e., CA State Parks, County of Orange, City of Huntington Beach, City of Newport Beach, City of Seal Beach, City of San Clemente)			

PGM BIO-3	Grunion monitoring will be implemented for any beach nourishment event occurring within the spawning season (per the CDFW published grunion spawning schedule for the year of the placement event) on any sandy beach where spawning could potentially occur and with sand placement or equipment access seaward of the MHTL. Regulatory agencies will be notified of monitoring events. Any deviations from the monitoring protocols in the Implementation Guidelines will require agency approval.	Monitoring summaries submitted post-sand placement event	Bolsa Chica State Beach (CA.1), Huntington Beach State Beach (CA.2), Crystal Cove State Park (CA.3), Doheny State Beach (CA.4), San Clemente State Beach (CA.5), Salt Creek Beach (OC.2), Capitstrano Beach County Park (OC.4), Poche Beach (OC.5) Sunset Beach (HB.1), West Newport Beach (NB.1), Balboa Beach (NB.3), Corona del Mar Beach (NB.4), Little Corona del Mar Beach (NB.5), Capistrano Shores (SC.1), San Clemente North Beach (SC.2), San Clemente Central City Beaches (SC.3), Cyprus Shore/Cottons (SC.4), East Beach (SB.2), Surfside Beach (SB.3)	Pre-construction during grunion season (Typically March – August; see CDFW annual schedule)	Site managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente, City of Irvine)			

PGM BIO-4	Turbidity monitoring will be implemented to avoid significant impacts to water quality if sand placement is seaward of the MHTL and in accordance with the scale of the nourishment event and percentage of fines in the source material. If the turbidity monitoring staff determines ocean water quality thresholds are exceeded, they have the authority to halt sand placement until water quality is restored. Regulatory agencies will be notified of monitoring events. Any deviations from the monitoring protocols in the Implementation Guidelines will require agency approval.	Turbidity logs to entity	Bolsa Chica State Beach (CA.1), Huntington Beach State Beach (CA.2), Crystal Cove State Park (CA.3), Doheny State Beach (CA.4), San Clemente State Beach (CA.5), Newport Dunes (OC.1), Salt Creek Beach (OC.2), Capistrano Beach County Park (OC.4), Sunset Beach (HB.1), Huntington Beach Bluffs (HB.3), West Newport Beach (NB.1), Balboa Beach (NB.3), Corona del Mar Beach (NB.4), Capistrano Shores (SC.1), San Clemente North Beach (SC.2), San Clemente Central City Beaches (SC.3), Cyprus Shore/Cottons (SC.4), East Beach (SB.2), Surfside Beach (SB.3)	During construction	Site managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente, City of Irvine)			

PGM BIO-5	In order to avoid impacts to adjacent native habitats and/or downstream aquatic jurisdictional resources at site OC.S.3 (Audubon Basin), a buffer large enough to install, maintain, and inspect stockpile BMPs will be established between any stockpiled soil and the sides of the maintenance road, and the basin overflow/spillway channel that drains to native riparian habitat, such as a silt fence, compost-filled or biodegradable wattle, or other similar erosion and siltation controlling construction BMPs. To avoid impacts to Greenville-Banning (D03) cement lined channel adjacent to site OC.S.2 (D03 D/S California at E01 Bike Trail), a buffer large enough to install, maintain, and inspect stockpile BMPs will be established between any stockpiled soil and the side of the maintenance road common to the channel. To avoid impacts to open water and salt marsh habitats in the Bolsa Chica/Westminster Channel, adjacent to stockpile site OC.S.1 (C02/C04 Confluence), a buffer large enough to install, maintain, and inspect stockpile BMPs will be established between any stockpiled soil and hinge point of the adjacent channel. The triangular portion of this site will only be used for stockpile storage of sediment with less than 35% fines if stored over the wet season.	Weekly inspection reports	Lot at Confluence (Bolsa Chica & Edinger) (OC.S1), Lot adjacent to the Santa Ana Bike Trail and Greenville Banning Channel (OC.S.2), Audubon Basin (OC.S.3)	Pre-construction and during construction	Contractor and Site managing entity (i.e., County of Orange)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
MM BIO-2	Placement of sand within each stockpile site will be located to the greatest extent possible within relatively flat terrain that is not in close proximity to and does not slope toward a potentially sensitive biological resource such as a jurisdictional aquatic resource or native habitat. Stockpiles not scheduled to be utilized within 14 days of placement will be considered non-active and the following protective measures will be implemented: • Temporary perimeter sediment barriers such as compost-filled wattles temporary silt dykes, biodegradable fiber rolls, burlap sandbags/, gravel bags will be installed to provide erosion and sediment control and to protect the stockpile from wind and rain. • Only biodegradable materials should be used for stockpile BMP protection, Any non-biodegradable BMP will be maintained and removed when no longer necessary.	Inspection and maintenance of logs	All stockpile sites	During construction	Site and Stockpile managing entity (i.e., County of Orange, CA State Parks, City of Huntington Beach, City of Newport Beach, and City of San Clemente, City of Irvine)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
PGM BIO-6	If sand placement occurs in the vicinity of known surfgrass, kelp, or hard (rocky) substrate (habitat of particular concern), monitoring of that habitat will occur in accordance with the sand placement scale and proximity to the surfgrass, kelp or hard (rocky) substrate. The monitoring protocol will be approved by the applicable regulatory agencies prior to permit issuance.	Monitoring report to the appropriate agencies	Salt Creek Beach (OC.2), Capitstrano Beach County Park (OC.4), West Newport Beach (NB.1), Balboa Beach (NB.3), Corona del Mar Beach (NB.4), Little Corona del Mar Beach (NB.5), Crystal Cove State Park (CA.3), Doheny State Beach (CA.4), San Clemente State Beach (CA.5), Capistrano Shores (SC.1), San Clemente North Beach (SC.2), San Clemente Central City Beaches (SC.3), Cyprus Shore/Cottons (SC.4)	Pre- and post-construction	Site managing entity (i.e., County of Orange, CA State Parks, City of Newport Beach, City of San Clemente, City of Irvine)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
PGM BIO-7	If sand placement occurs in the vicinity of known or potential eelgrass, monitoring of eelgrass will occur in accordance with the California Eelgrass Mitigation Policy (CEMP) (NOAA 2014, or most up-to-date policy).	CEMP-compliant reports submitted to the appropriate agencies post-placement event	Newport Dunes (OC.1), Baby Beach (OC.3), Huntington Harbour Beaches (HB.2), Newport Harbor Beaches (NB.2)	Pre- and post-construction	Site managing entity (i.e., County of Orange, City of Huntington Beach, and City of Newport Beach)			
PGM BIO-8	Tidal inlet monitoring that typically occurs, may need to be increased or rescheduled appropriately following implementation of sand placement events that have the potential to impact tidal inlets to coastal marshes to ensure that nourishment events do not result in significant impacts to tidal exchange considering the scale of the nourishment event and distance to the tidal inlet, and approved by the applicable regulatory agencies prior to permit issuance.	Monitoring results provided to the appropriate agencies post-sand placement event	Bolsa Chica State Beach (CA.1), Huntington Beach State Beach (CA.2), Newport Dunes (OC.1), Sunset Beach (HB.1), West Newport Beach (NB.1), Surfside Beach (SB.3)	During construction	Site managing entity where placement occurred, not where tidal inlet occurs, has responsibility to inform the tidal inlet manager. (i.e., County of Orange, CA State Parks, , City of Seal Beach, City of Huntington Beach, City of Newport Beach)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
SC CUL-1	If an archaeological resource is found, it will be examined by a Qualified Archaeologist. If it is determined by the Qualified Archaeologist to be indigenous in nature, a Native American representative will be consulted. If the Qualified Archaeologist determines the resource to be significant, avoidance and preservation in place will be the preferred manner of mitigating impacts pursuant to 15126.4(b)(3)(A). If avoidance is determined to be infeasible, the Qualified Archaeologist will prepare a data recovery and treatment plan tailored to the physical nature and characteristics of the resource. The data recovery plan will identify data recovery excavation methods, research questions, measurable objectives, and data thresholds to reduce any potential significant impacts to the resource. The resulting documentation will be submitted to the regional repository of the California Historical Resources Information System (CHRIS).	Documentation of compliance	All sites	During construction	Contractor and site managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente, City of Irvine)			

RCM CUL-1	Human Remains. In the event that human remains are encountered on The Program site, work within 50 feet of the discovery shall be redirected and the County Coroner notified immediately consistent with the requirements of California Code of Regulations (CCR) Section 15064.5(e). State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code (PRC) Section 5097.98. If the remains are determined to be Native American, the County Coroner shall notify the Native American Heritage Commission (NAHC), which shall determine and notify a Most Likely Descendant (MLD). With the permission of the property owner, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC. The MLD may recommend scientific removal and non-destructive analysis of human remains and items associated with Native American burials. Consistent with CCR Section 15064.5(d), if the remains are determined to be Native American and an MLD is notified, the County shall consult with the MLD as identified by the NAHC to develop an agreement for treatment and disposition of the remains. Prior to the issuance of any permits, the Director of the Orange County Public Works Department, or designee, shall verify that all plans specify the requirements of CCR Section 15064.5(e), State Health and Safety Code Section 7050.5, and PRC Section 5097.98, as stated above..	Documentation of compliance	All sites	During construction	Contractor and site managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente, City of Irvine)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
RCM ENRG-1	The construction contractor will ensure that all construction trucks comply with CARB's idling restrictions (Title 17 CCR Section 93116), limiting idling to 5 minutes, except under safety-related or operational conditions.	Inspection logs	All sites	During construction	Contractor			
RCM ENRG-2	The rail operator will reduce unnecessary locomotive idling where feasible, per 40 CFR Part 1033. Where practical, the use of Tier 4 or equivalent low-emission locomotives, automatic shutdown/startup systems, or electrification will be encouraged.	Coordination record	Doheny State Beach (CA.4), Capitstrano Beach County Park (OC.4) , Poche Beach (OC.5), Capistrano Shores (SC.1), San Clemente North Beach (SC.2), San Clemente Central City Beaches (SC.3), Cyprus Shore/Cottons (SC.4), Lot within Great Park (MCAS El Toro) (I.S.1)	During construction	Site managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente, City of Irvine)			
SC HAZ-1	Fueling and maintenance of construction vehicles will occur in designated areas away from surface water, with spill prevention measures in place	Inspection logs	All sites	During construction	Contractor			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
SC HAZ-2	Fuels, oils, and other flammable materials will have secondary containment measures and will not be stored onsite. Storage should comply with California Fire Code Sections 5704 and 5706.	Inspection logs	All sites	During construction	Contractor			
RCM HAZ-1	All Program locations will comply with the California Fire Code (Title 24, California Code of Regulations [CCR], Part 9) and the Cal/OSHA Construction Safety Orders for fire prevention (Title 8, CCR, Section 6777). The construction contractor will implement all applicable fire prevention and suppression measures, including maintaining fire suppression equipment on-site and training construction personnel in fire safety procedures. Compliance will be verified by the construction manager through regular site inspections during active construction.	Inspection logs	All sites	During construction	Contractor			
SC HYD-1	The contractor will place impervious ground cover under construction equipment that is not in use to prevent leaks from entering surface and groundwater sources.	Daily log	All sites	During construction	Contractor			
SC HYD-2	The contractor will regularly maintain construction equipment per manufacturer guidelines to prevent leaks from happening.	Maintenance records	All sites	Pre-construction and during construction	Contractor			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
SC HYD-3	The contractor will avoid traversing in the wetted sand area except for required construction activities.	Daily log	All sites	During construction	Contractor			
MM NOI-1	Where construction activities involving trains are planned within 25 feet of occupied structures or sensitive uses, the managing entity or construction contractor will notify property owners and provide the schedule, duration and contact information for noise-related concerns.	Notification documentation	Doheny State Beach (CA.4), Capitstrano Beach County Park (OC.4) , Poche Beach (OC.5), Capistrano Shores (SC.1), San Clemente North Beach (SC.2), San Clemente Central City Beaches (SC.3), Cyprus Shore/Cottons (SC.4), I.S.1	During construction	Beach managing entity (i.e., County of Orange, CA State Parks, City of San Clemente) or Contractor			
RCM NOI-1	All construction activities, including equipment warm-up, will be limited to the hours permitted by the local jurisdiction. Unless otherwise approved in writing by the City or County (depending on the jurisdiction where construction is taking place), construction will only occur during the dates and times listed in Table 3-1: Days and Times Approved for Construction by Jurisdiction. No construction will occur on Sundays or federal holidays.	Daily logs / non-compliance reporting	All sites	During construction	Contractor			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
SC PS-1	Construction equipment will not block line-of-sight to the ocean at lifeguard towers. Sight lines from the viewing platforms of the lifeguard towers will be maintained and there will be no interference with views for the lifeguards.	Daily field log	All beach receiver sites	During construction	Contractor			
SC PS-2	Mobile lifeguard towers will be temporarily relocated during construction to maintain public safety (only if relocation is necessary to conduct sand placement construction activities).	Relocation documentation	All beach receiver sites	During construction	Contractor in coordination with the beach managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente)			
MM REC-1	Should a pipeline be used for sand placement, the pipeline will be covered with sand or other suitable mat material as needed at intervals to create walkover areas to facilitate public beach and water access.	Daily log	All sites	During construction	Contractor			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
MM REC-2	Public access to beaches and the ocean will be maintained adjacent to active sand placement area as long as public safety is not compromised.	Daily log	All sites	During construction	Contractor			
MM REC-3	Signs will be posted advising the public of the presence of steep sand slopes (e.g., scarps) should they develop on beaches where sand has been placed.	Photo documentation	All sites	Pre-construction and during construction	Contractor or beach managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente)			
PGM REC-1	Potentially dangerous scarps that may form after sand placement will be knocked down/layed back/graded by the beach managing entity.	Maintenance log	All sites	During and after construction	Beach managing entity (i.e., County of Orange, CA State Parks, City of Seal Beach, City of Huntington Beach, City of Newport Beach, City of San Clemente)			

Measure #	Mitigation Measure/Regulatory Compliance Measure/Best Management Practice	Reporting	Applicable Location/s	Timing	Responsible Party	Verification of Compliance		
						Initials	Date	Remarks
RCM TRA-1	Prior to the start of any construction activity that will affect public roadways, the Contractor will prepare and implement a site-specific Traffic Control Plan (TCP) in accordance with local and state requirements (California Vehicle Code Section 21400 and 21401; California Code of Regulations Sections 1598 and 1599).	Inspection logs	All sites	Pre-construction and during construction	Contractor			