FINAL
PISMO BEACH SHORELINE PROTECTION PROJECT ENVIRONMENTAL ASSESSMENT/ MITIGATED NEGATIVE DECLARATION

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SECTION 1.0 – INTRODUCTION

This Joint Environmental Assessment/Mitigated Negative Declaration (EA/MND) has been prepared for the Los Angeles District of the U.S. Army Corps of Engineers (USACE) and the City of Pismo Beach (local non-federal sponsor) for the Pismo Beach Shoreline Protection Project (Project). This EA/MND analyzes potential environmental impacts associated with the proposed action and alternatives for providing shoreline protection to six locations along the Pismo Beach shoreline. Although six sites are analyzed in this document, four of the sites were economically justified for a federal project. Funding is currently available only for the St. Andrews Lift Station and Vista Del Mar Lift Station sites.

The USACE is the Federal lead agency for this Project and has prepared this EA in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. § 4321, as amended). The City of Pismo Beach (City) is the State lead agency and has prepared this MND in accordance with the California Environmental Quality Act (CEQA) of 1970 (Cal. Pub. Res. Code § 21000-21177).

1.1 BACKGROUND AND PROJECT PURPOSE

The City of Pismo Beach is located within the upper reach of San Luis Bay in San Luis Obispo County, California (Figure 1-1). The southern portion of the Pismo Beach shoreline is characterized by a broad sandy beach. The remainder of the shoreline consists of coastal bluffs backing rocky shores and narrow pocket beaches. The coastal bluffs are eroding. The main factors affecting bluff erosion are wave attack at the base of the seacliff, gradual erosion and flattening of the terrace deposits above the cliff, and the geologic makeup of the seacliffs.

Five areas in the northern portion of Pismo Beach have been identified as chronically erosional to the extent that structures are threatened. These five areas from north to south are: 1) St. Andrews Lift Station (a lift station is a pump that raises sewage from a lower elevation sewer line to a higher elevation sewer line), 2) Vista del Mar Lift Station, 3) Ocean Park, 4) Price Street - North, and 5) Price Street - South. At each of these sites, loss of material due to erosion of bluff faces and toes has jeopardized existing street rights-of-way, infrastructure, and public improvement. Because the beach has minimal sand these areas, the bluffs are exposed to direct wave activity during winter storms. A sixth site (Cypress Street Lift Station) at the southern end of Pismo Beach has also experienced chronic bluff-top erosion and bluff toe erosion, jeopardizing a sewer pump station and roadways. The Cypress Street Lift Station site is adjacent to a sand dune fronted by a wide beach; however during storms, waves are able to reach and attack the dune toe, causing instability in the bluff system. Figure 1-2 shows the six dangerously eroding sites. The purpose of this Project is to protect the toe of the bluffs at these six sites from erosion caused by waves.

1.2 PROJECT LOCATION

The Project area is located in the northern portion of the City of Pismo Beach in San Luis Obispo County, California (Figure 1-1 and Figure 1-2). The Project area extends from the St. Andrews Lift Station near Seacliff Drive and Memory Park in the Shell Beach area to the Cypress Street

Lift Station near the foot of Harloe Street just north of the Pismo Beach Pier. The specific location of each of the sites is described below:

- St. Andrews Lift Station – The site is located in front of the lift station near the intersection of Baker Avenue and Seacliff Drive in Shell Beach. Memory Park is near the site.
- Vista del Mar Lift Station – The site is located in front of the Vista del Mar Lift Station near the intersection of Vista del Mar Avenue and Ocean Boulevard in Shell Beach.
- Ocean Park – The site is located in front of Ocean Boulevard between Wawona Avenue and Capistrano Avenue in Shell Beach.
- Price Street - North – The site is located off Price Street in Pismo Beach. The site is between Dinosaur Caves Park and the Best Western Shelter Cove Lodge.
- Price Street - South – The site is located off Price Street near tennis courts between the Best Western Shelter Cove Lodge and the Pelican Point Restaurant adjacent to the Best Western Shorecliff Hotel.
- Cypress Street Lift Station - The site is located in front of the lift station at the foot of Harloe Avenue.

1.3 NEED FOR THE PROPOSED ACTION

The six sites proposed for protection are suffering severe and accelerating erosion. At each of the sites, roadways, utilities, and/or parks and in some cases houses are threatened. Bluff protection in the past has consisted of a hodgepodge of emergency measures, such as revetments and seawalls that are unsightly and ineffective. The erosion also makes it difficult and unsafe for the public to access the shoreline. Bluff erosion is an ongoing dynamic process that will continue to impact the Pismo Bluffs. On-going retreat is likely to continue to encroach upon existing structures located above the seacliff, undermine coastal stairways and seawalls, and erode adjacent lands, reducing building setbacks. At these sites, increased erosion eventually will result in the loss of utilities, park space and roads, and the construction of stopgap emergency protective structures. For example, Price Street likely will be damaged by erosion within the next decade, and Highway 101 also is in jeopardy. Protection of the bluff toe is needed to keep the seacliffs at these sites from additional wave erosion.

1.4 AUTHORIZATION

This study is authorized under Section 208 of the Flood Control Act of 1965 and Section 103 of the River and Harbor Act of 1962 (PL 87-874). Section 103 River and Harbor Act of 1962 (PL 87-874), as amended, empowers the USACE to participate in the cost of protecting shores of publicly-owned property from storm damage.

Figure 1-1:
Project Vicinity

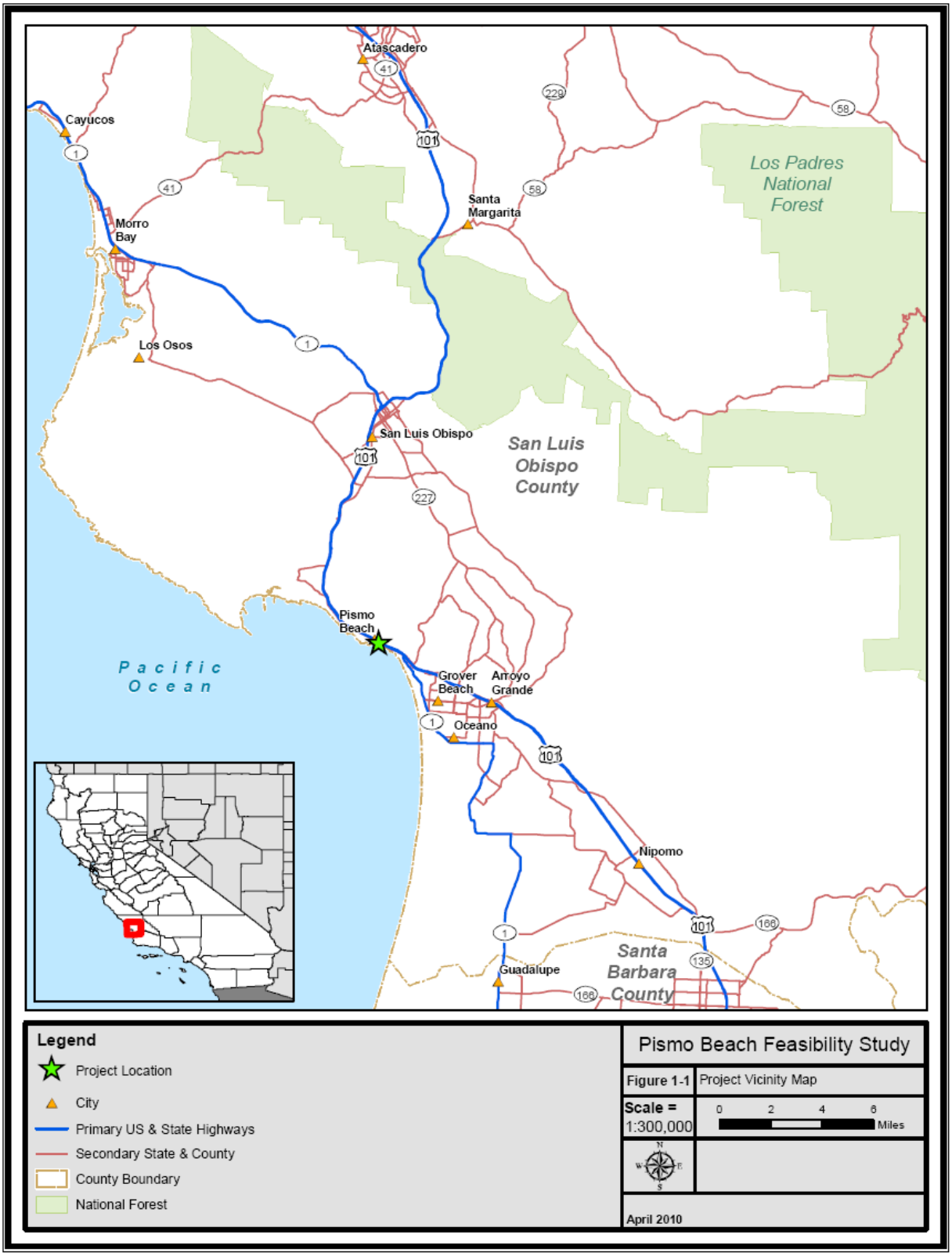
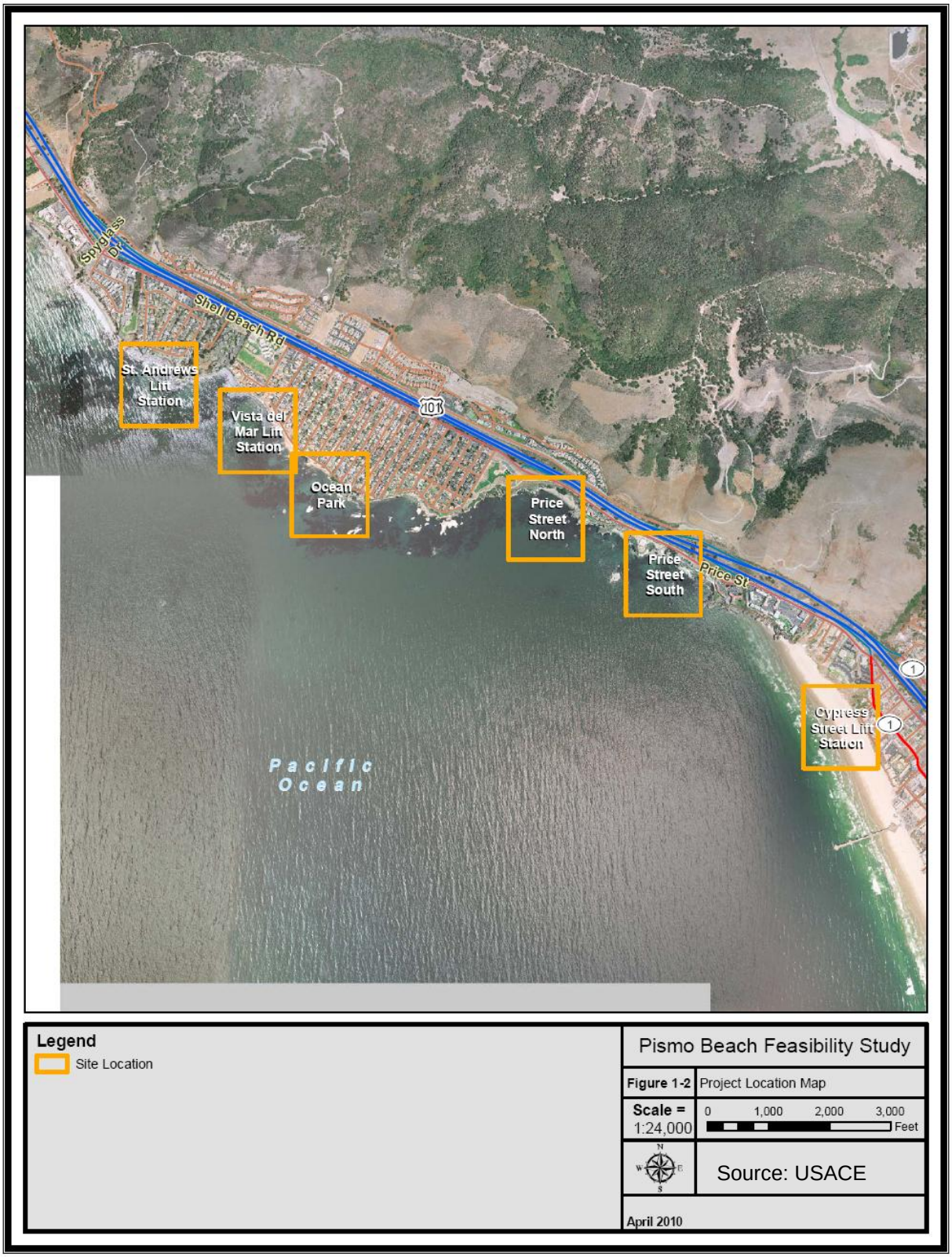


Figure 1-2:
Project Location Map



SECTION 2.0 – DESCRIPTION OF THE PROPOSED ALTERNATIVES

Four alternative designs are proposed for this Project. Not all sites are appropriate for every design alternative. Table 2-1 identifies which design alternatives apply to each site and provides approximate dimensions.

Table 2-1: Characteristics of Alternatives at Each Site

Site	Alternative	Approximate Beach Footprint (acres)	Approximate Alongshore Length (feet)	Revetment Crest/Wall Top/Toe Elevation (feet, MLLW*)	Rock Quantity (tons)
St. Andrews Lift Station	1	0.18	110	+22/+4	3,500
	2/3	0.06	110	+20/+8	800
Vista del Mar Lift Station	1	0.17	120	+22/+4	4,000
	2/3	0.06	120	+20/+8	900
Ocean Park	1	0.20	150	+22/+3	5,000
	2/3	0.08	150	+20/+8	1,100
Price St - North	1	0.39	270	+22/+4	8,300
	2/3	0.22	270	+20/+8	1,800
Price St - South	1	0.16	160	+22/+5	5,200
	2/3	0.16	160	+20/+6	1,100
Cypress Street Lift Station	1	0.87	680	+20/+14	20,700
	4	0.15	680	+20/+18	4,400

*MLLW – Mean Lower Low Water

2.1 ALTERNATIVE 1: ROCK REVETMENT

The rock revetment alternative is proposed for all six sites. The use of a rock revetment for shore protection involves the placement of large stones at the base of the bluffs. Rock revetments protect bluffs from wave-induced scour by effectively dissipating wave energy within voids between stones. Except at the Cypress Street Lift Station site, the crest height of the revetments at Pismo Beach is +22 feet Mean Lower Low Water (MLLW). For the Cypress Street Lift Station site, the wave run-up would not be as high on the bluff face because of the wide beach and dunes. At the Cypress Street Lift station site, the crest height of the revetment would be +20 feet MLLW. The armor stone size of the revetment is 5 tons. Figure 2-1 to Figure 2-6 show the cross sections of the revetment alternative at each site. Figure 2-7 to Figure 2-12 show the footprints of the rock revetment at each site. Table 2-1 shows the characteristics of the revetment alternative at each site.

Figure 2-1:
St. Andrews Lift Station Revetment Alternative Cross-section

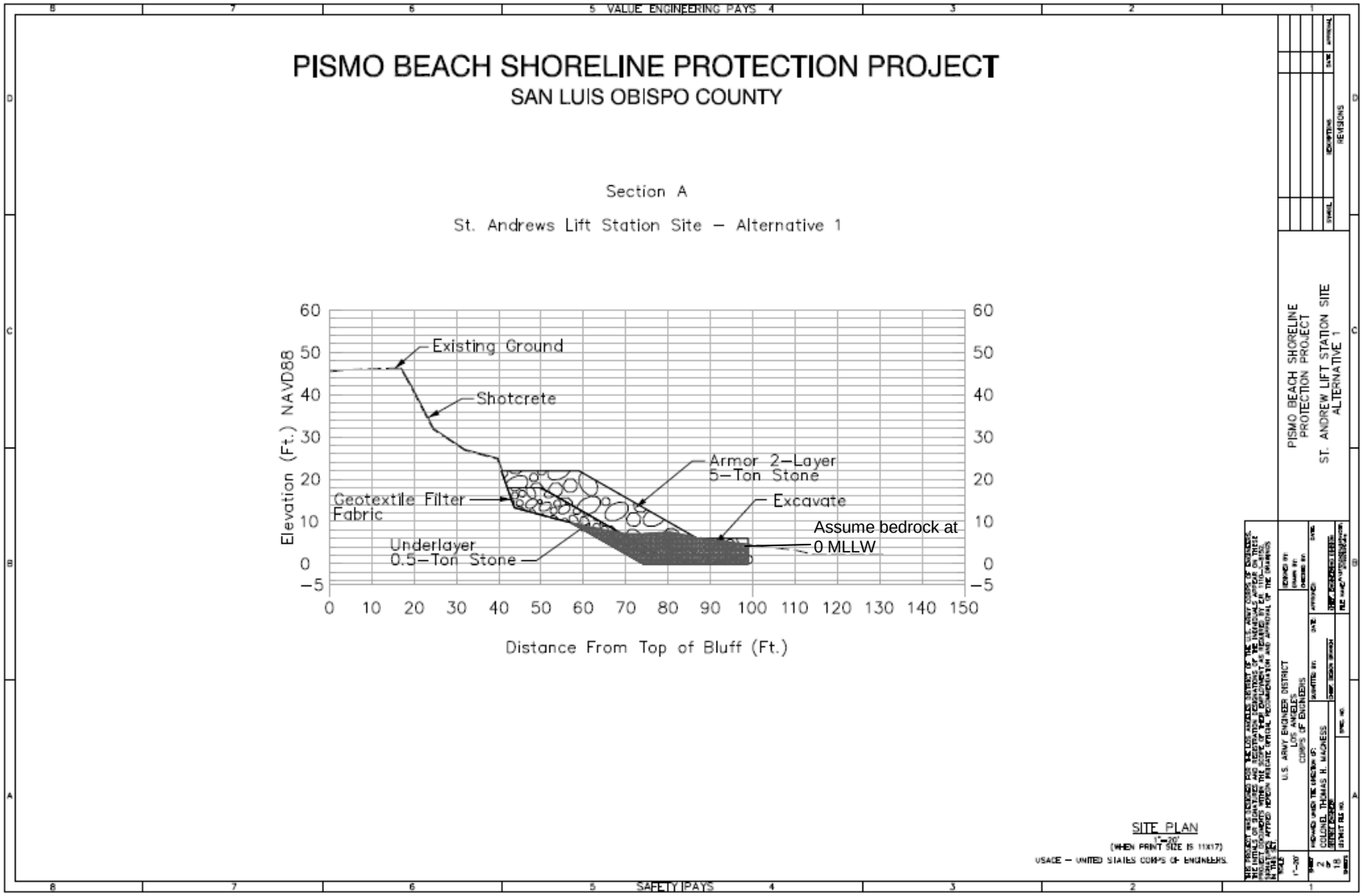


Figure 2-2:
Vista del Mar Lift Station Revetment Alternative Cross-section

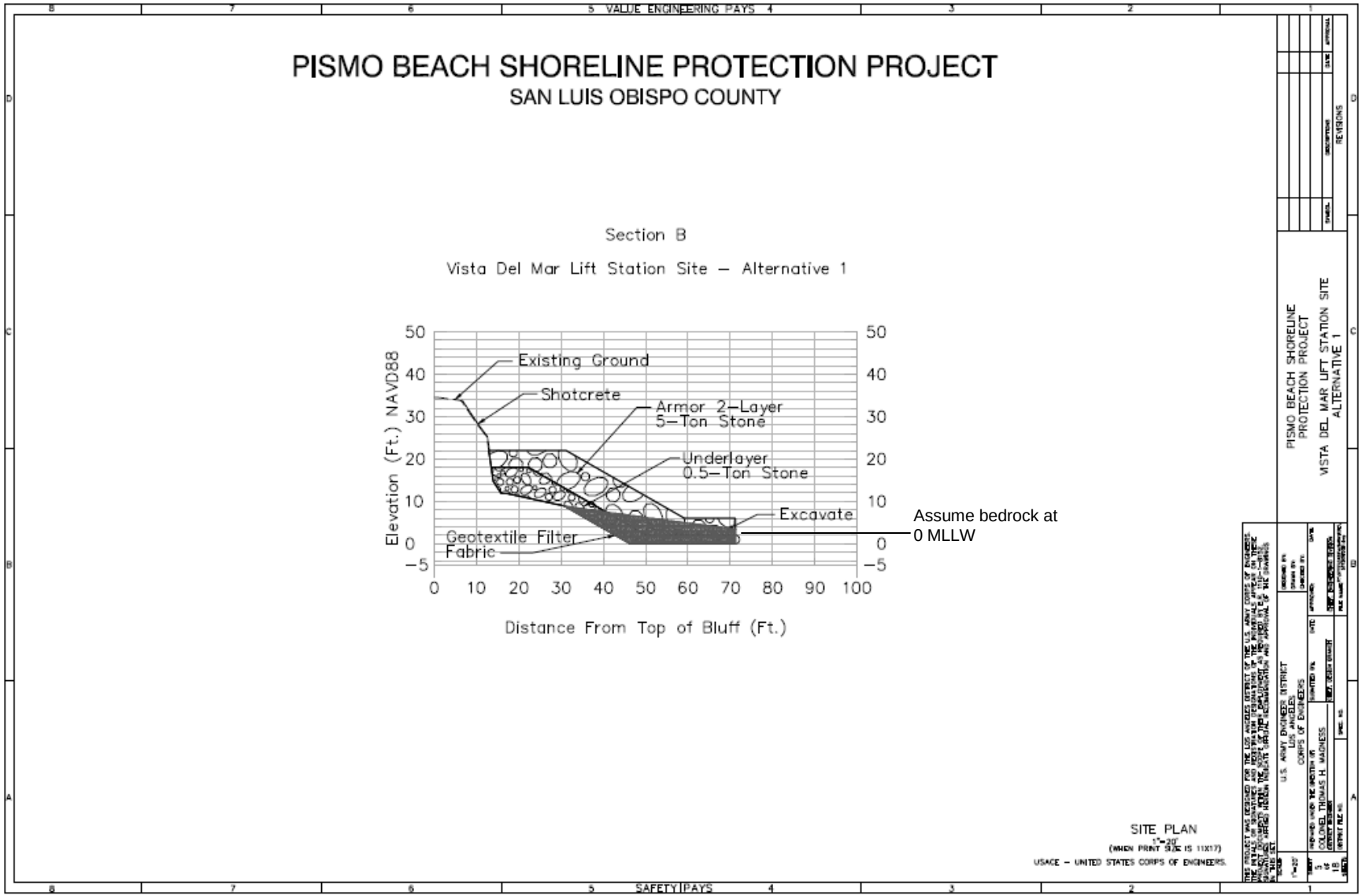


Figure 2-3:
Ocean Park Revetment Alternative Cross-section

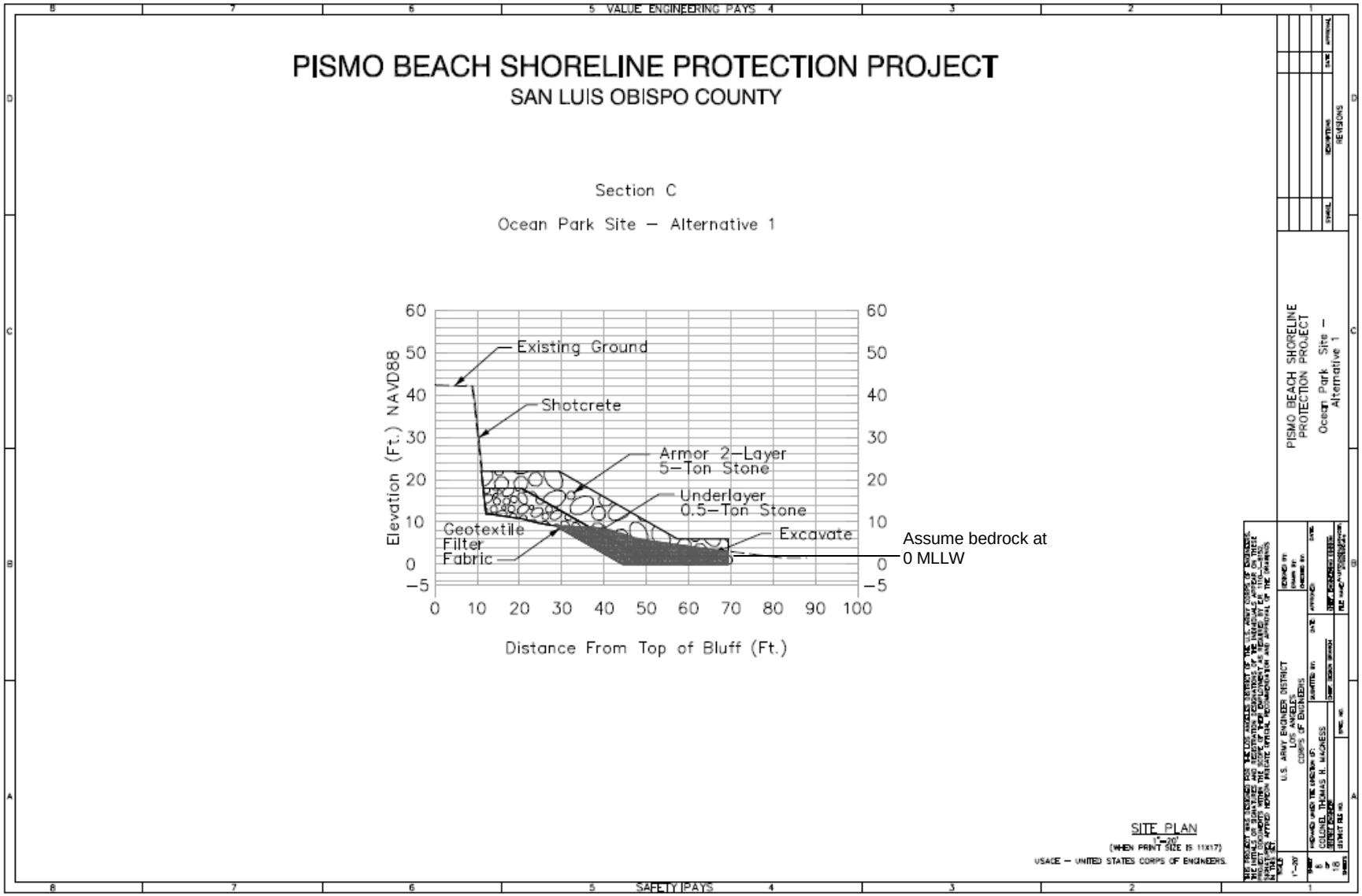


Figure 2-4:
Price Street - North Revetment Alternative Cross-section

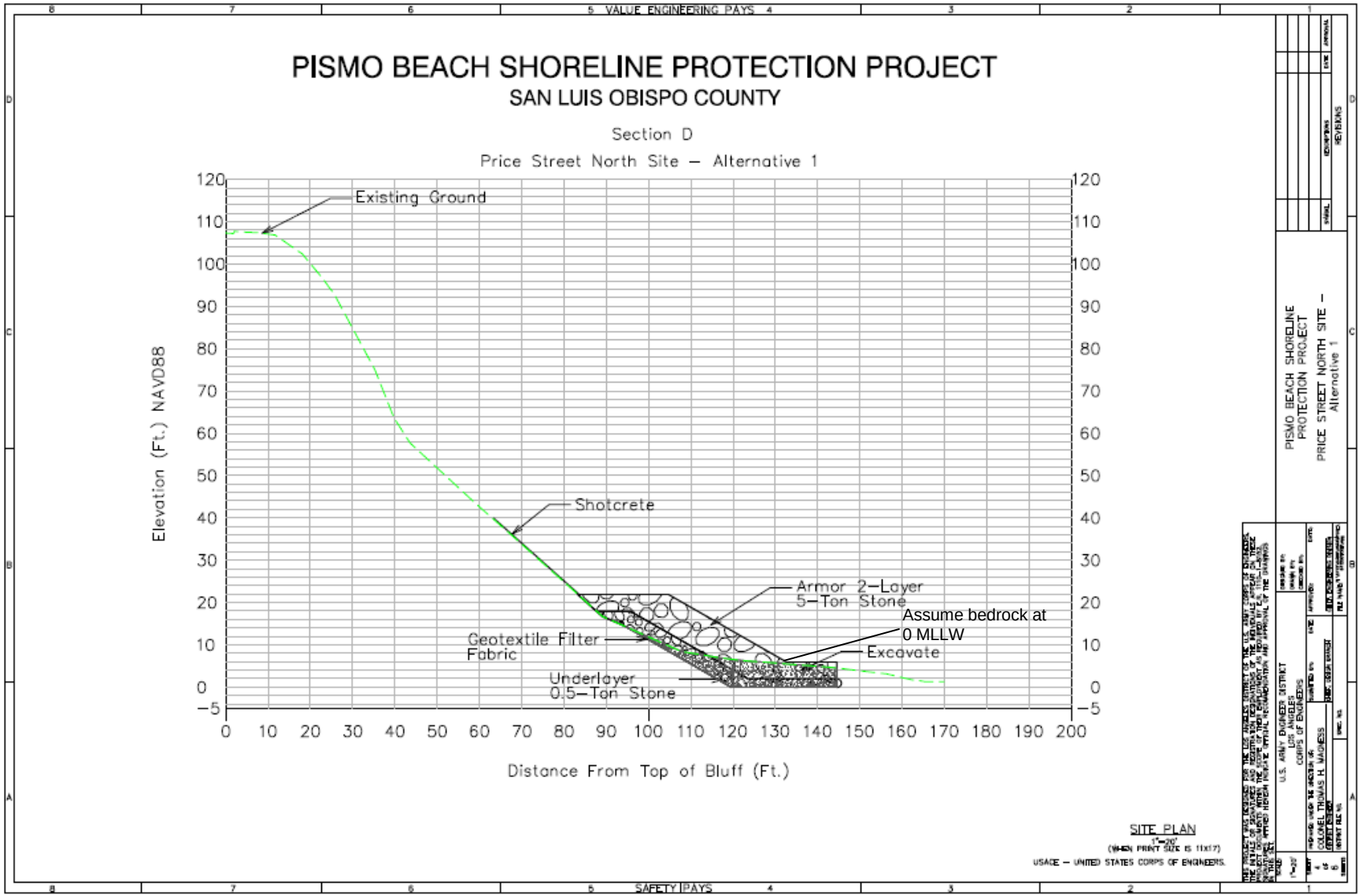


Figure 2-5:
Price Street - South Revetment Alternative Cross-section

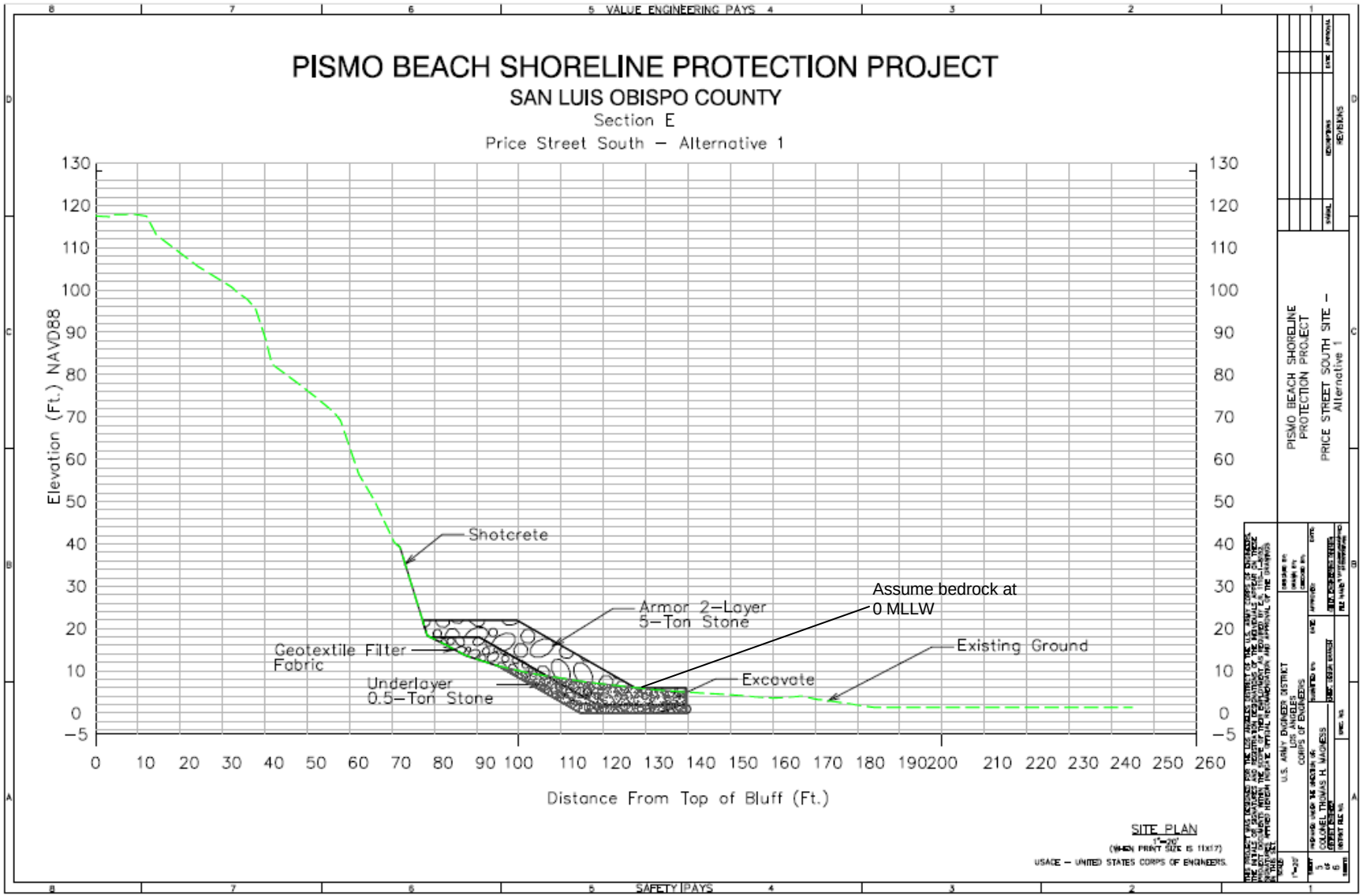


Figure 2-6:
Cypress Street Lift Station Revetment Alternative Cross-section

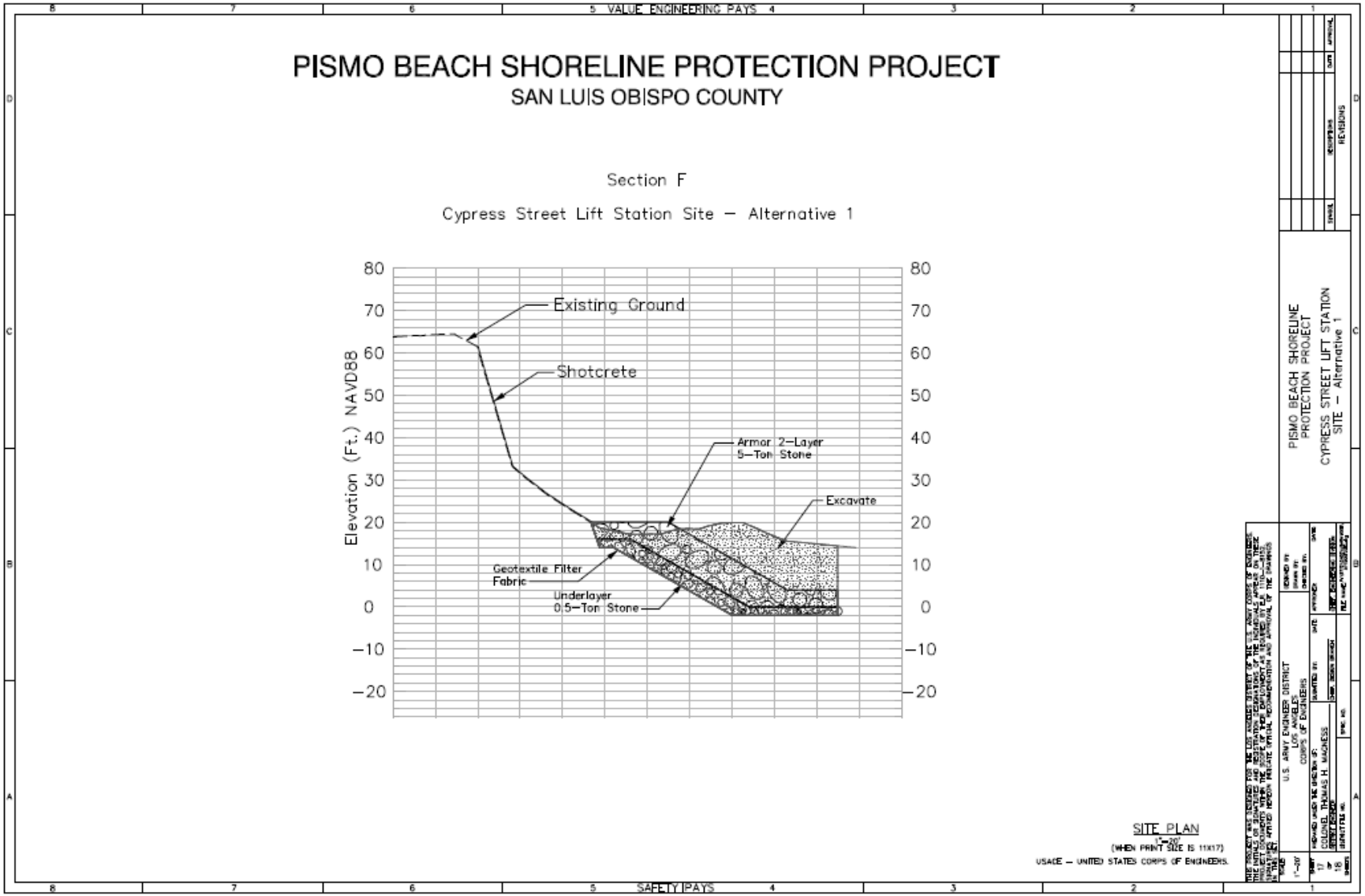


Figure 2-7:
St. Andrews Lift Station Alternatives Footprints

Figure 2-8:
Vista del Mar Lift Station Alternatives Footprints

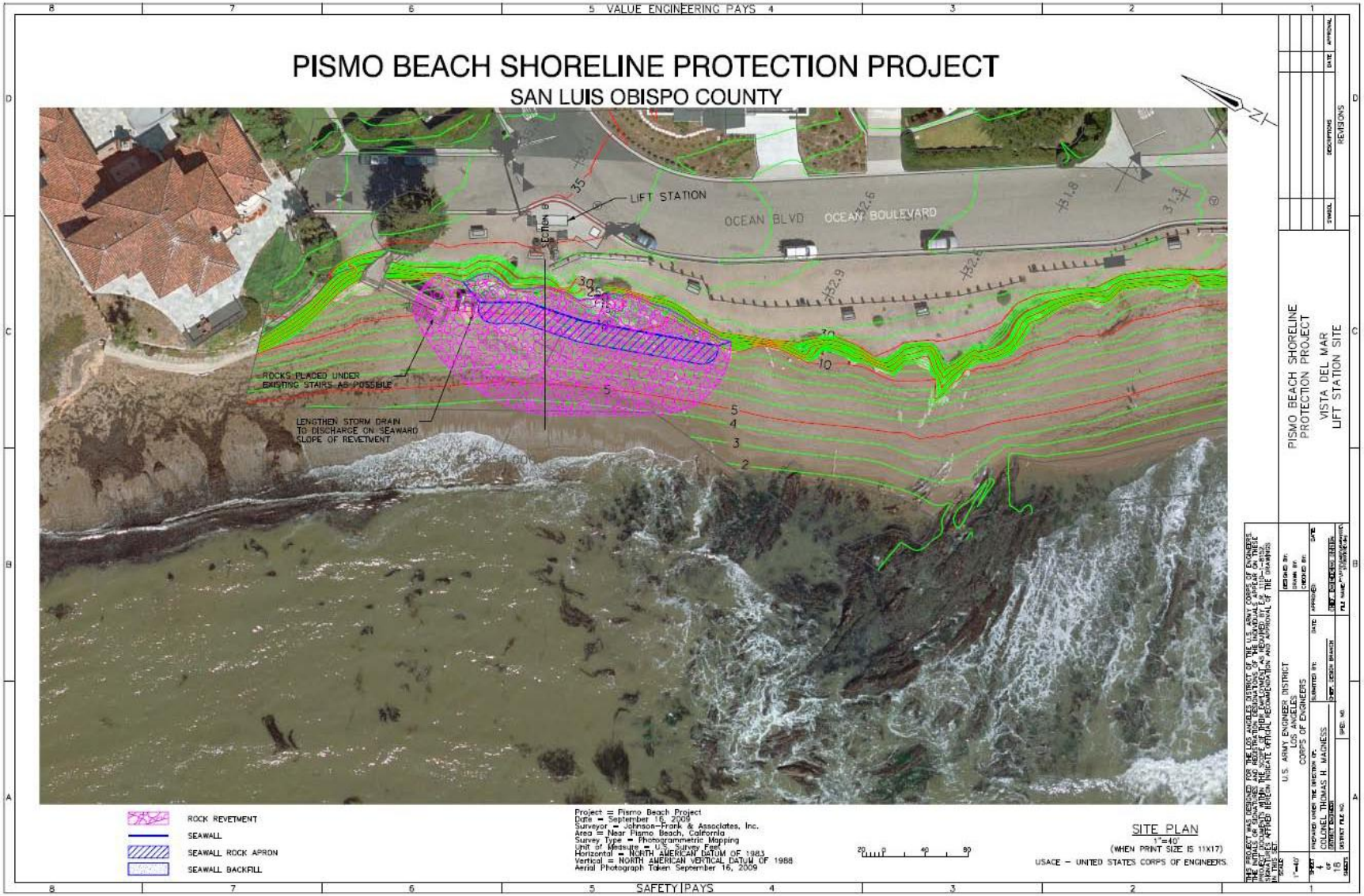


Figure 2-9:
Ocean Park Alternatives Footprints

Figure 2-10:
Price Street - North Alternatives Footprints

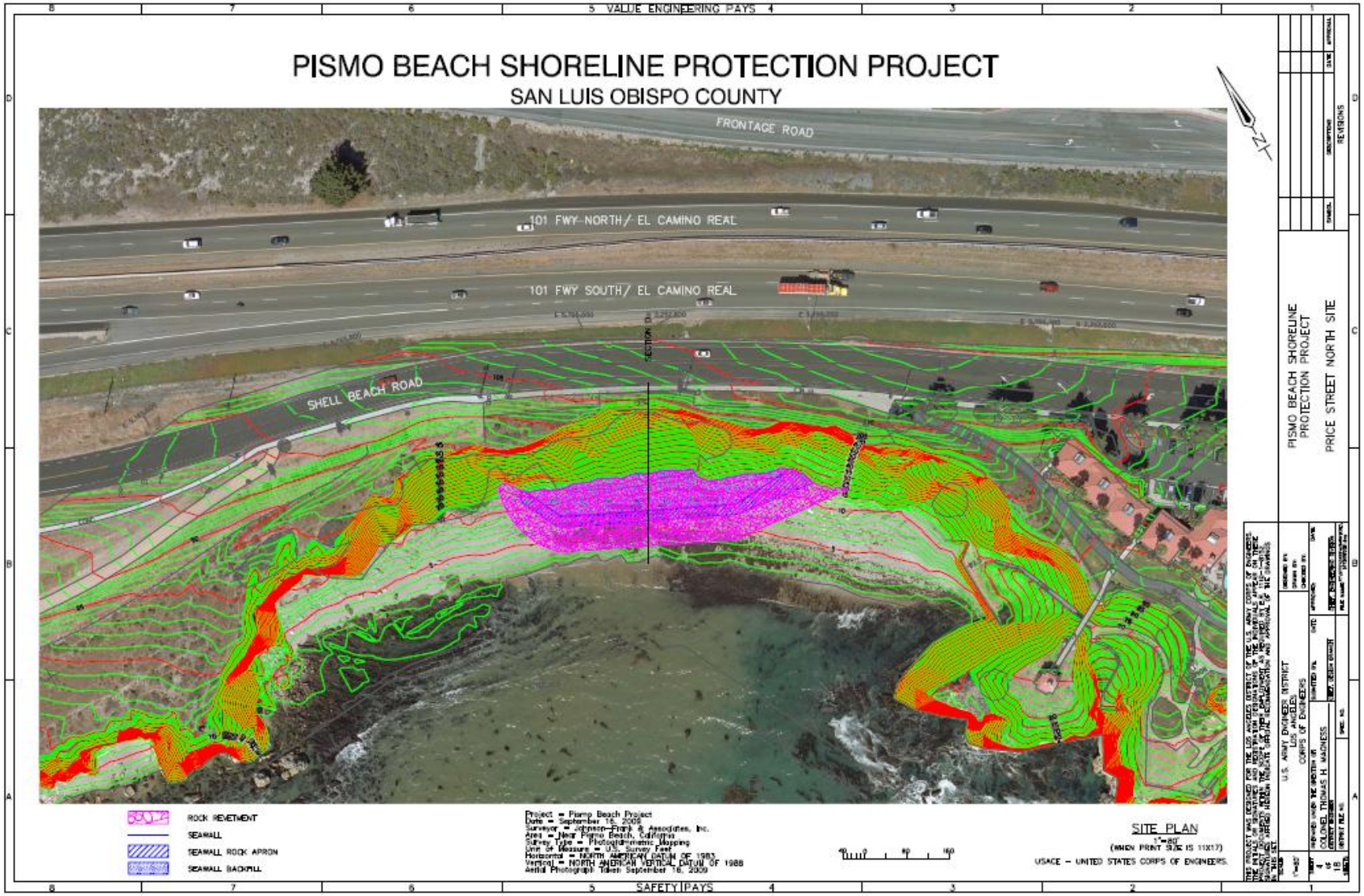


Figure 2-11:
Price Street - South Alternatives Footprints

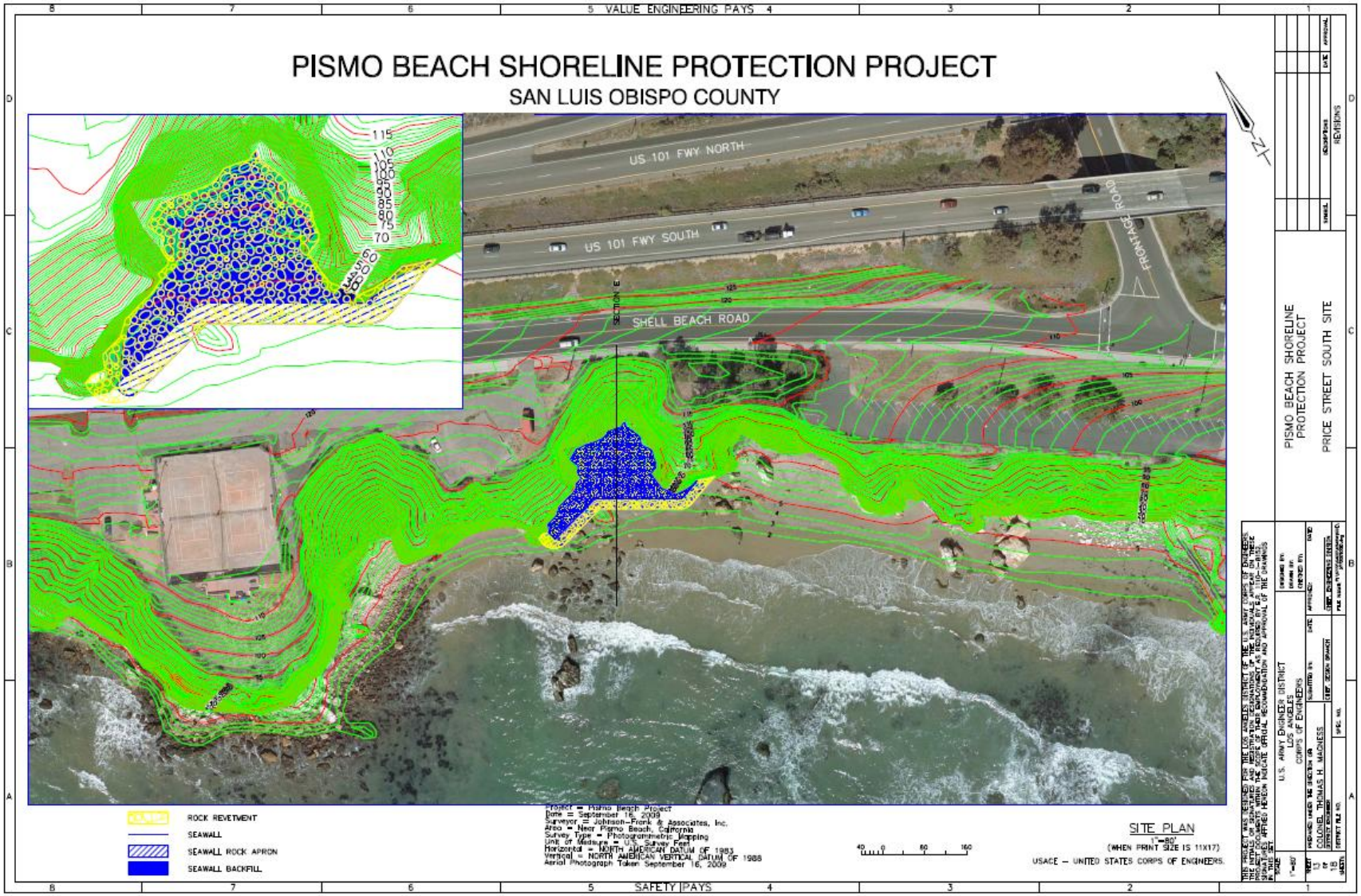


Figure 2-12:
Cypress Street Lift Station Alternatives Footprints

2.2 ALTERNATIVE 2: VERTICAL CONCRETE WALL

A vertical concrete wall is a vertical wall made out of concrete that would be constructed at the toe of the bluffs. This alternative most likely would be a cast-in-place, pile-supported or gravity concrete wall. It is assumed that the footing of the seawall could be embedded into the underlying bedrock to provide sufficient structural stability without the need for drilling shafts into the bottom or tiebacks onto the slopes. However, geotechnical information and further analysis is needed to confirm this. A rock apron would be constructed at the base of the seawall to minimize the risk of scour and undermining of the wall footing. The concrete wall would be placed a distance from the bluff face, and the gap between the wall and the bluff would be filled with soil (or soil/gravel mix). This fill would permit some sloughing of the upper bluff face because as the upper bluff face flattens it would be held in place by the filled gap region. Weep holes would be constructed through the seawall at approximately mean sea level to allow for drainage. The crest height of the seawalls for all sites would be +20 feet MLLW.

Figure 2-13 through Figure 2-17 show the cross-section of the seawall alternatives at each site. Figure 2-7 through Figure 2-12 show the footprint of the seawall alternatives at each site. Table 2-1 shows the characteristics of the seawall alternative at each site.

The Alternative 2 seawall design is proposed at all sites except Cypress Street Lift Station.

2.3 ALTERNATIVE 3: SCULPTED CONCRETE/SHOTCRETE WALL

Alternative 3, a sculpted concrete/shotcrete wall, is very similar to Alternative 2, the vertical sea wall. The sculpted concrete/shotcrete wall alternative would have a similar cross-section (Figures 2-13 to 2-17) and footprint (Figures 2-7 to 2-11) to the vertical seawall alternative at each site. The difference between Alternative 2 and Alternative 3 is that the sculpted concrete/shotcrete wall would be constructed to more closely match the alignment of the adjacent bluff toes, and it would have a shotcrete surface colored to blend in with the natural bluffs. The colored shotcrete facing would produce a more natural and pleasing aesthetic appearance than the vertical sea wall. Similar to Alternative 2, the pocket behind the wall would be filled with soil (or soil/gravel mix) to permit some sloughing of the upper bluff face, and shotcrete would be applied to the bluff face above the wall to minimize erosion caused by extreme wave run-up. This alternative would include weep holes to allow for drainage as described in Section 2.2 for the vertical concrete wall. The sculpted concrete/shotcrete wall could be designed to include protuberances for seabird roosting. Figure 2-18 shows an example of a sculpted concrete/shotcrete wall under construction at Florin Street in Pismo Beach.

Figure 2-13:
St. Andrews Lift Station Seawall Alternative Cross-section

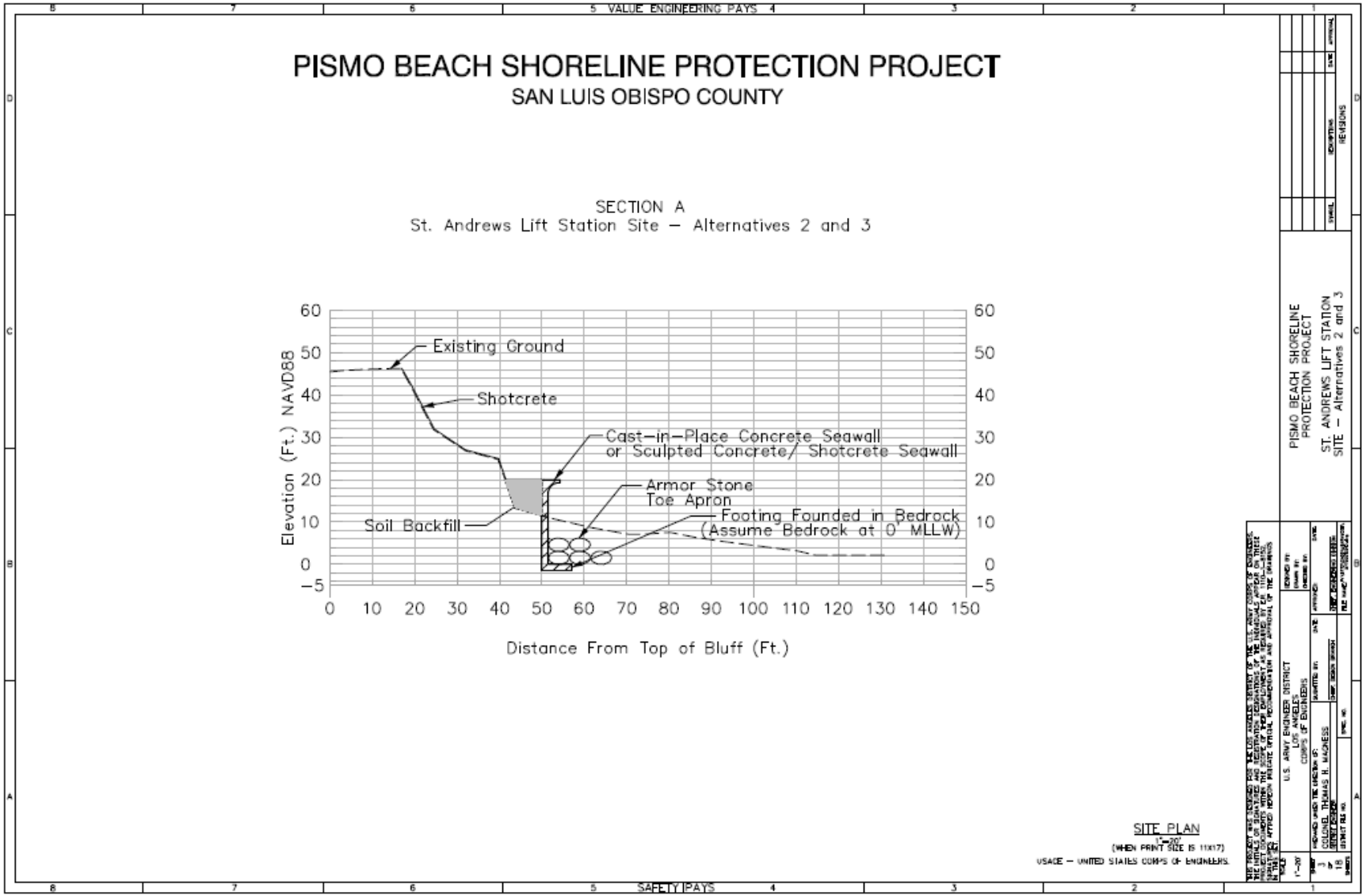


Figure 2-14:
Vista del Mar Lift Station Seawall Alternative Cross-section

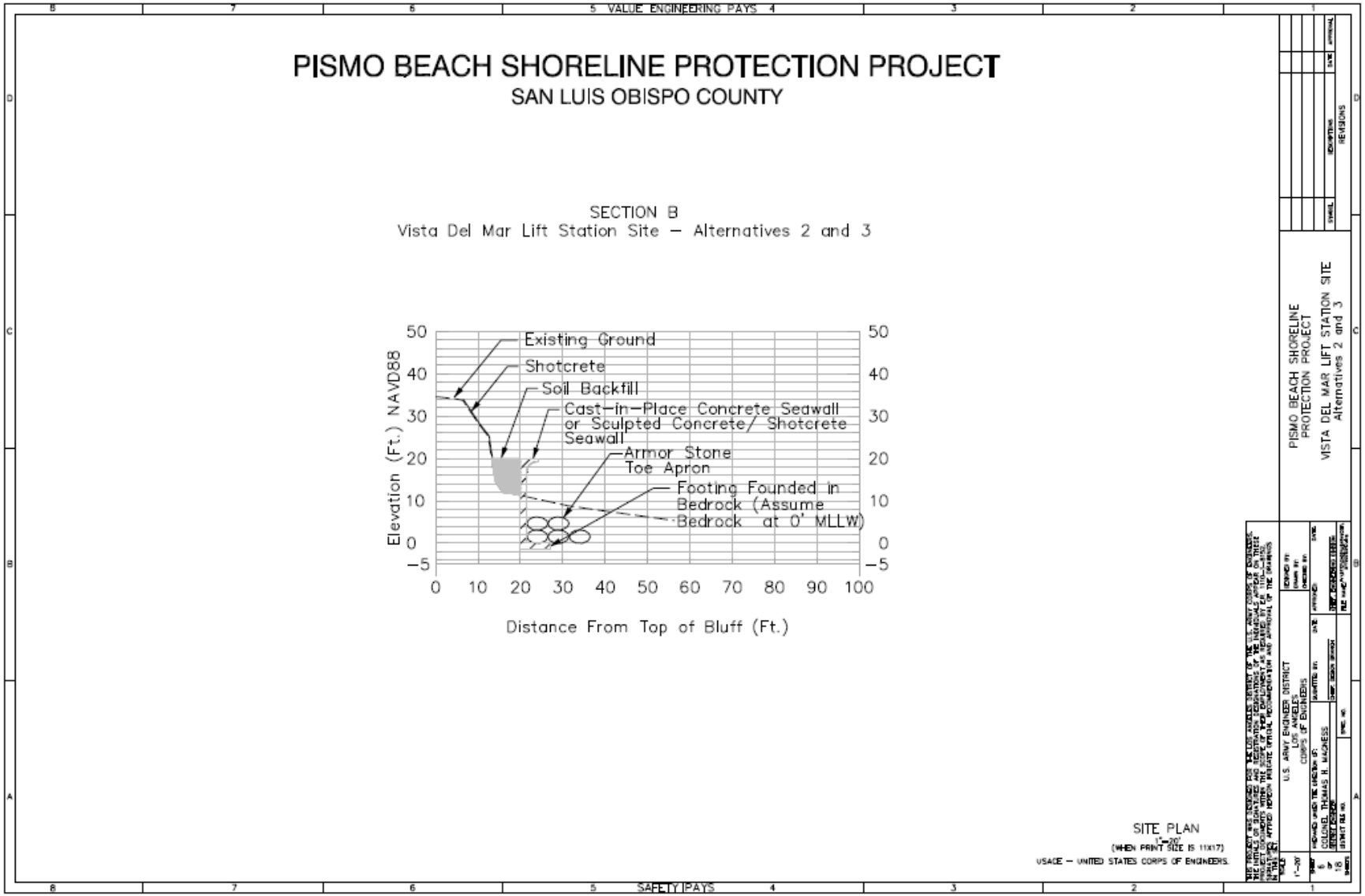


Figure 2-15:
Ocean Park Seawall Alternative Cross-section

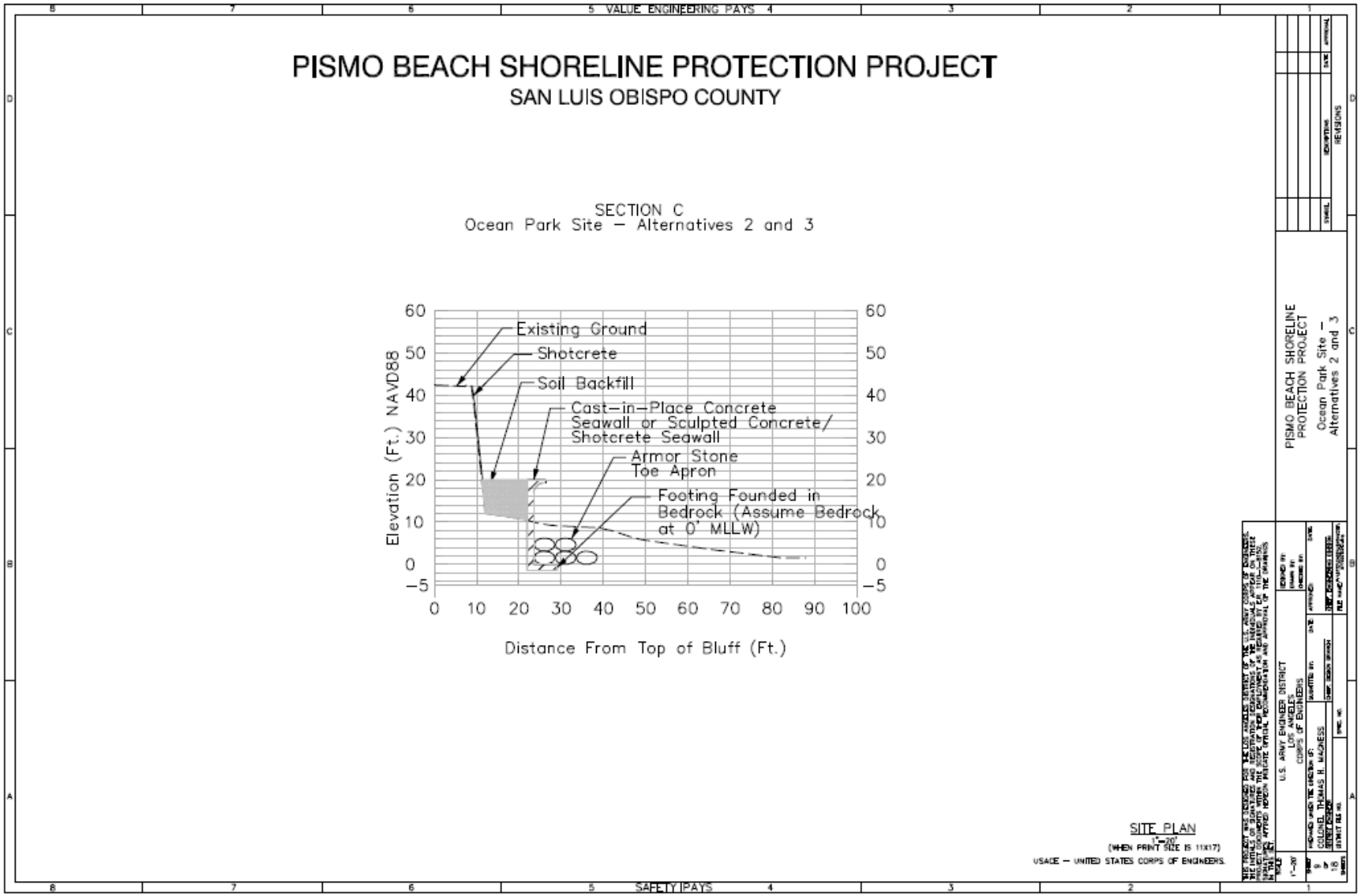


Figure 2-16:
Price Street - North Seawall Alternative Cross-section

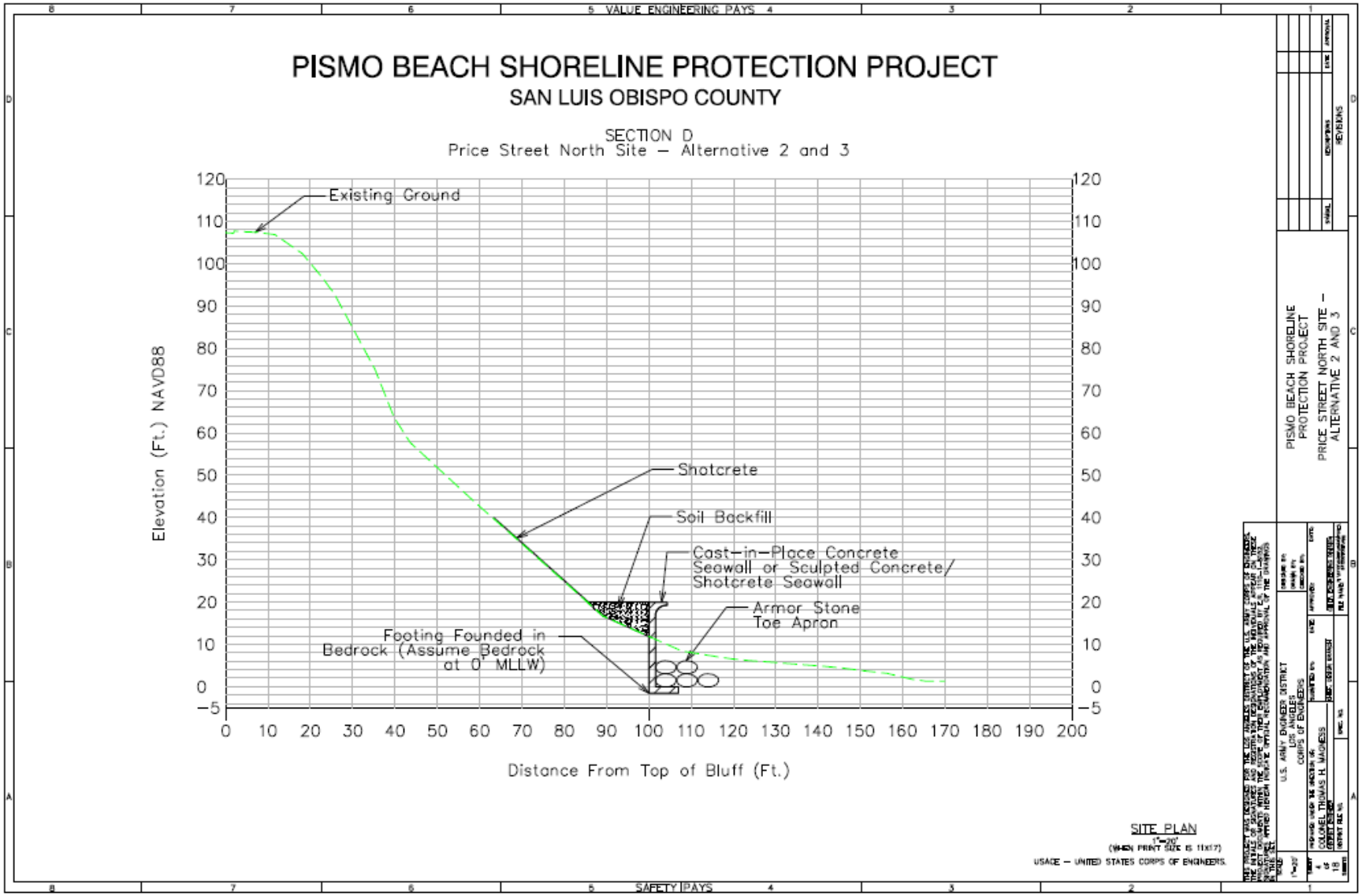


Figure 2-17:
Price Street - South Seawall Alternative Cross-section

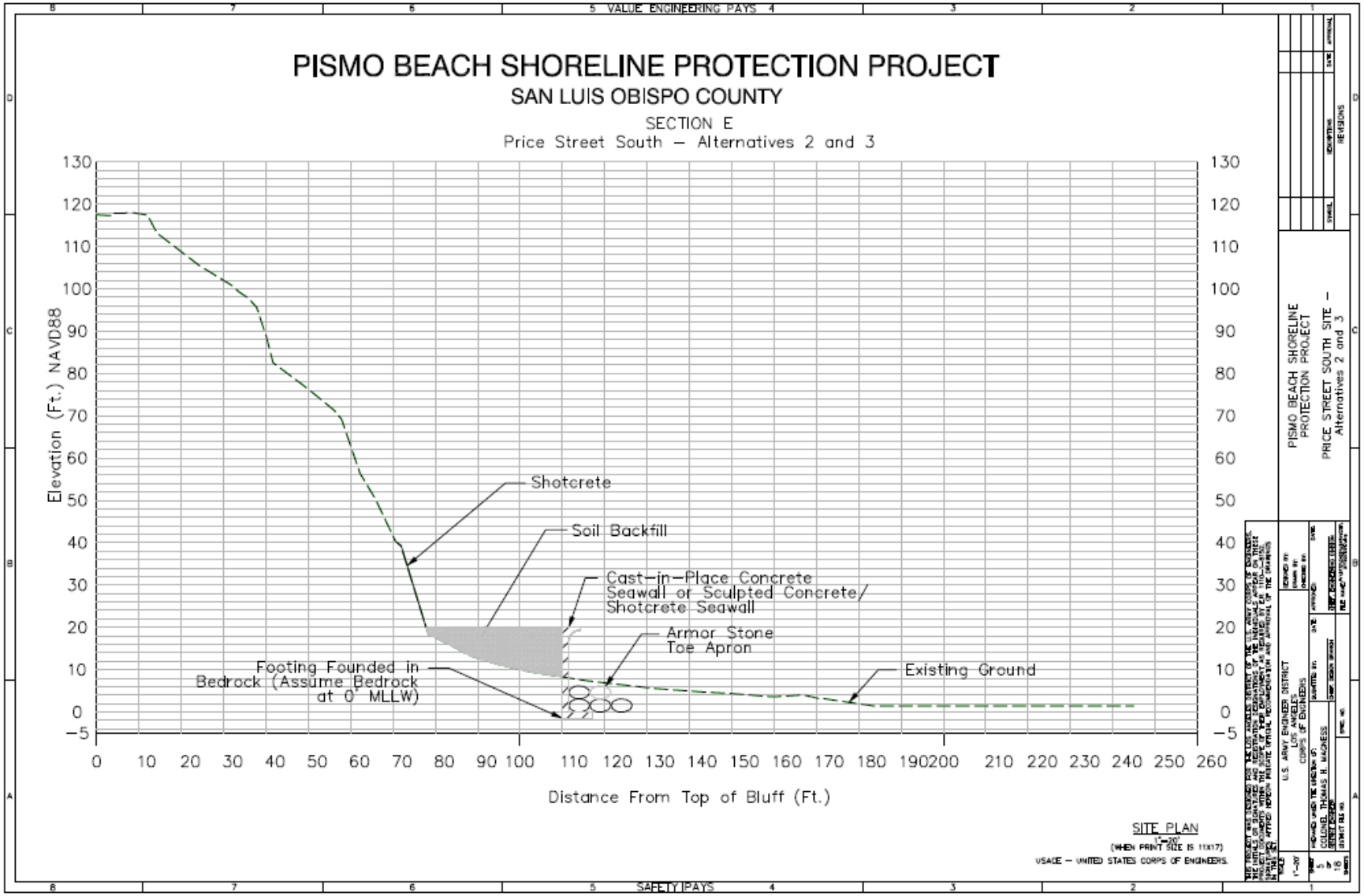
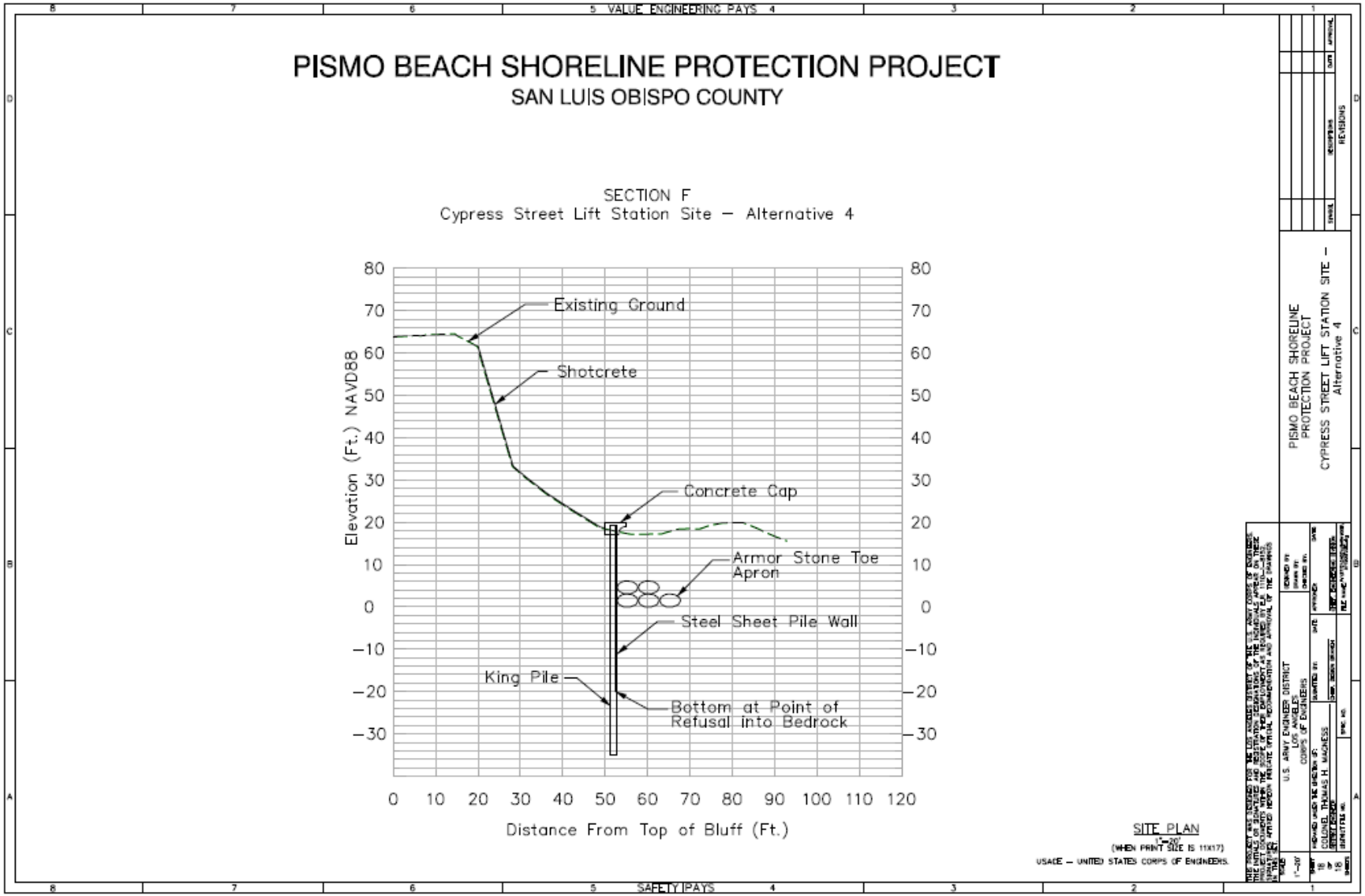


Figure 2-18:
Sculpted Concrete/Shotcrete Wall at Florin Street in Pismo Beach

2.4 ALTERNATIVE 4: STEEL SHEET PILE WALL (CYPRESS STREET LIFT STATION SITE ONLY)

Alternative 4, a steel sheet pile wall, is proposed only at the Cypress Street Lift Station site. Steel sheet pile walls could not be constructed at the other sites because the other five sites have limited beach access for driving sheet-pile walls. In addition, the steel wall would be visible at the other five sites and is not considered to be visually appealing. At the Cypress Street Lift Station site, a steel sheet pile wall (instead of a concrete wall) is proposed because: a) pile-driving from the beach is possible at this site, b) aesthetic issues would not be a factor because the steel wall would be mostly buried by sand, c) it has less of a construction footprint than a concrete wall, and d) it is less expensive than the vertical concrete or sculpted wall alternatives. At the Cypress Street Lift Station site, a steel sheet pile seawall could be driven in place close to the bluff face and would most likely be covered by sand. Figure 2-19 shows a cross-section for the sheet pile wall alternative. The sheet pile wall would have an armor stone toe apron and a concrete cap. Shotcrete would be applied to the upper slopes to protect the bluff from erosion caused by extreme wave run-up. Figure 2-12 shows the footprint of the seawall at Cypress Street. Table 2-1 shows the characteristics of the steel sheet pile wall at the Cypress Street Lift Station site.

Figure 2-19:
Cypress Street Lift Station Sheet Pile Wall Alternative Cross-section



2.5 CONSTRUCTION OF ALTERNATIVES

Construction of the alternatives would be similar. The alternatives differ in the amount of equipment, the number of workers, and construction duration. Table 2-2 compares the equipment, number of workers and construction duration at each site.

Table 2-2:
Construction Equipment Details

Alternative	Equipment	Equipment Size (hp)	# of Workers	Construction Duration	
				All Sites Except Price St. North and South	Price St. North and South Sites
1 - Rock Revetment	Truck Crane Loader (2) Excavator Concrete Pump truck (shotcrete op)	600 300 (ea.) 400 300	8 to 10	3 months	5 months
2 - Vertical Concrete Wall	Truck Crane Loader/ Forklift Excavator Concrete Pump truck Compressor	600 300 400 300 150	10 to 12	4 months	7 months
3 - Sculpted Concrete / Shotcrete Wall	Truck Crane Loader/ Forklift Excavator Concrete Pump truck Compressor	600 300 400 300 150	12 to 14	5 months	8 months
4 - Steel Sheetpile Wall	Truck Crane Loader/ Forklift Excavator Welding Machine (2) Compressor Concrete Pump truck	600 300 400 100 (ea.) 150 300	8 to 10	4 months (applicable to Cypress St. Lift Station only)	N/A

Construction at the Price Street sites would take longer than at the other sites because of the access difficulties at these sites and the height of the bluffs, which are over 100 feet high in the Price Street area. At both the Price Street - North site and the Price Street - South site,

construction work would need to be staged from the top of the bluff. A large landside bluff-top crane would lower construction material and equipment down to the beach. The contractor may choose to place an elevated, temporary work platform on the beach and use an additional smaller crane to service the workers on the platform. Workers and equipment could be stationed on this platform to place wall or revetment material and continue operations during high tides.

For all sites, both the revetment and seawall alternatives would require trench excavation work for rock placement down to 0 feet MLLW. For all sites except the Cypress Street Lift Station site, the seawall alternative would require drilling for seawall embedment into the bedrock. Excavated material would be removed from the cut location and placed on the beach or used as backfill landward of the seawall. Excavated trench material would not need to be hauled off site. For all sites and all alternatives, (assuming the bluff face at all sites is relatively stable), shotcrete would be applied to the bluff face above the wall to minimize erosion caused by extreme wave run-up. Shotcrete is concrete or mortar applied with a pressure hose.

For the St. Andrews Lift Station, Vista del Mar Lift Station, and Ocean Park sites, construction work also would use a land crane located on the top of the bluff. The bluff toe access at these sites is significantly better than at the Price Street sites. The bluffs' crest-to-toe elevations are only 25 to 35 feet in height. Construction material would be lowered into place using the crane. Small construction equipment would be lowered onto the sand during low tides, and some work could occur from the beach.

The staging area at each of the sites would be similar for all alternatives. Figure 2-20 to Figure 2-25 show the staging area at each site. At all sites except Cypress Street Lift Station, the staging area would cause closure of part of the adjacent street. At the Cypress Street Lift Station site, staging most likely would occur at the beach level. This site is more accessible than the other five sites, and construction equipment and material would be able to cross the sand for construction access. At the Price Street sites, Price Street may need to be closed completely at times.

Construction activities will need to be conducted during lower tides. All or part of the beach at each site would need to be closed during construction activities.

Rock, concrete, and soil would need to be hauled in by truck. Table 2-3 shows the number of truck trips for each alternative at each site. The most likely rock source would be Santa Margarita, approximately 23 miles from Pismo Beach. Figure 2-26 to Figure 2-29 show the probable haul routes for trucks.

2.6 INITIAL CONSTRUCTION

Federal funding for the proposed Project is through the Continuing Authorities Program (CAP), which imposes funding limitations for projects it funds. The limit for shoreline protection projects (Section 103 WRDA 1986) is a federal contribution of up to $5 million. The limit includes all costs from problem identification through the end of construction. This cost limit constrains the Project to two sites. The City of Pismo Beach has selected the two exposed sewer lift stations, St. Andrews Lift Station (Site 1) and Vista del Mar Lift Station (Site 2) as their

highest priority sites. The Price Street North (Site 4) and Price Street South (Site 5) sites have benefits in common that can only be realized if both sites are constructed at the same time.

An economic analysis was prepared for the Project (USACE, 2010). The analysis estimated costs and benefits for each alternative for each site. The following sites and alternatives have positive net benefits and Benefit Cost (BC) ratios greater than one: Site 1, alternatives 1 and 2; Site 2, alternatives 1, 2, & 3; and the combined Sites 4 and 5, alternatives 1, 2, and 3. All the other sites and alternatives have BC ratios less than one. The sites and alternatives with Benefit Cost ratios greater than one have a Federal project interest based upon National Economic Development (NED) criteria.

Based on the results of the economic analysis (USACE, 2010) and this EA/MND, the following sites and alternatives were proposed in the Draft EA/MND for initial construction:

1. St. Andrews Lift Station with the rock revetment alternative; and

2. Vista del Mar Lift Station with the sculpted concrete wall alternative.

The rock revetment alternative was selected for the St. Andrews Lift Station site. Two alternatives at this site (rock revetment and concrete vertical wall) have BC ratios greater than one and meet NED criteria. The rock revetment alternative was selected due to its lower cost, to the existence of rock at the site, and the lack of public access to the beach at this site.

Based on public input to the Draft EA/MND regarding the high use of an informal public access path and significant public beach use at the St. Andrews Lift Station site, the construction of a sculpted sea wall rather than a revetment was selected for the site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

The sculpted concrete wall alternative was selected for the Vista del Mar Lift Station site. All three alternatives have BC ratios greater than one and meet NED criteria. The rock revetment alternative was not selected because this site has more of a beach and the revetment footprint is larger and more intrusive onto the beach, which does have public access that could be affected. The vertical concrete wall alternative at the Vista del Mar Lift Station is considered to be aesthetically less pleasing, and the sculpted concrete wall is preferred even with its additional costs.

Construction at the remaining four sites may be pursued in the future with alternative funding sources. Therefore, those sites are retained in this Draft EA/MND to allow for a thorough review of all sites and alternatives that can be used for future construction. Construction at the two Price Street sites (north and south) is the more likely in the short term of the four remaining sites.

Figure 2-20:
St. Andrews Lift Station Staging Area

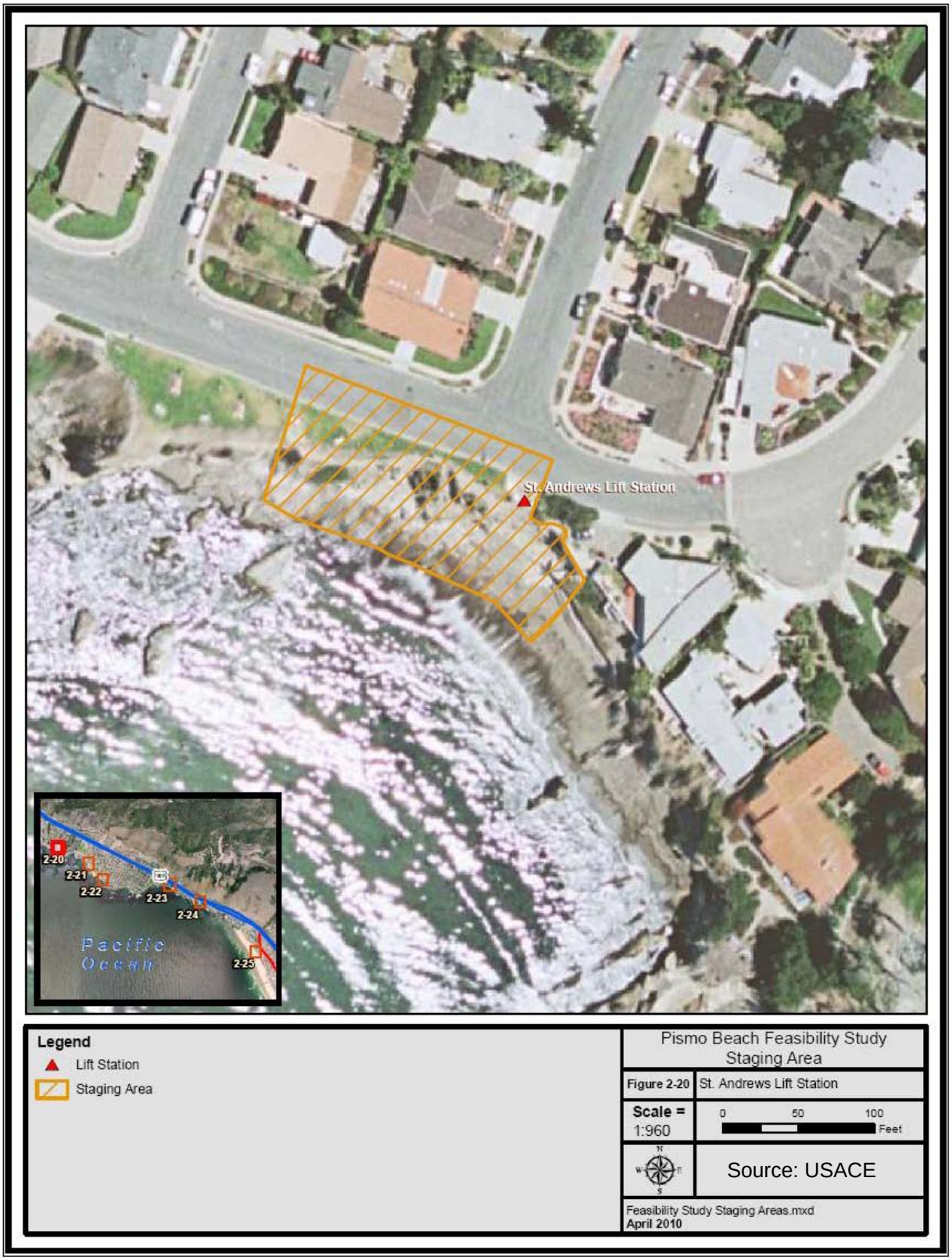


Figure 2-21:
Vista del Mar Lift Station Staging Area

Figure 2-22:
Ocean Park Staging Area

Figure 2-23:
Price Street - North Staging Area

Figure 2-24:
Price Street - South Staging Area

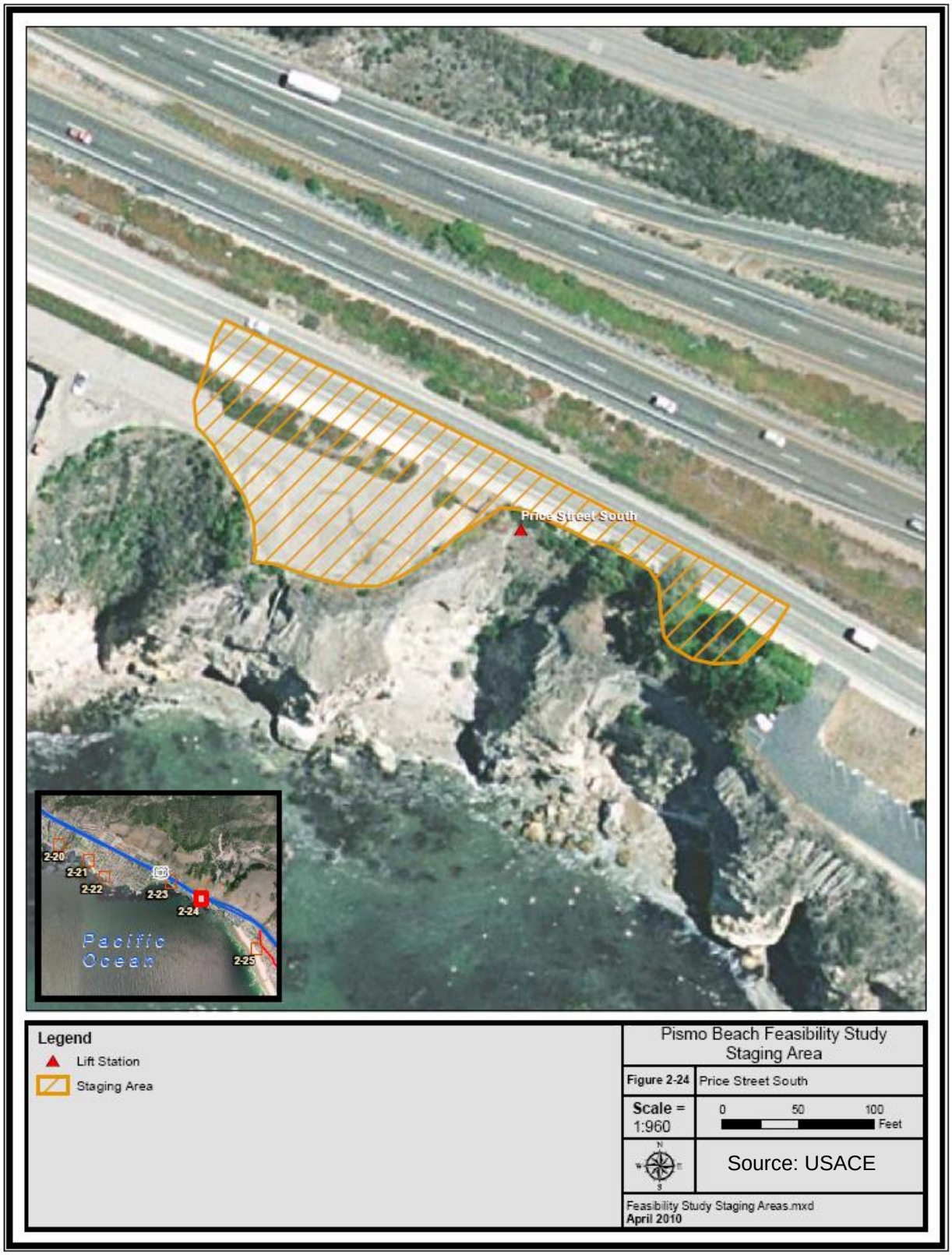


Figure 2-25:
Cypress Street Lift Station Staging Area

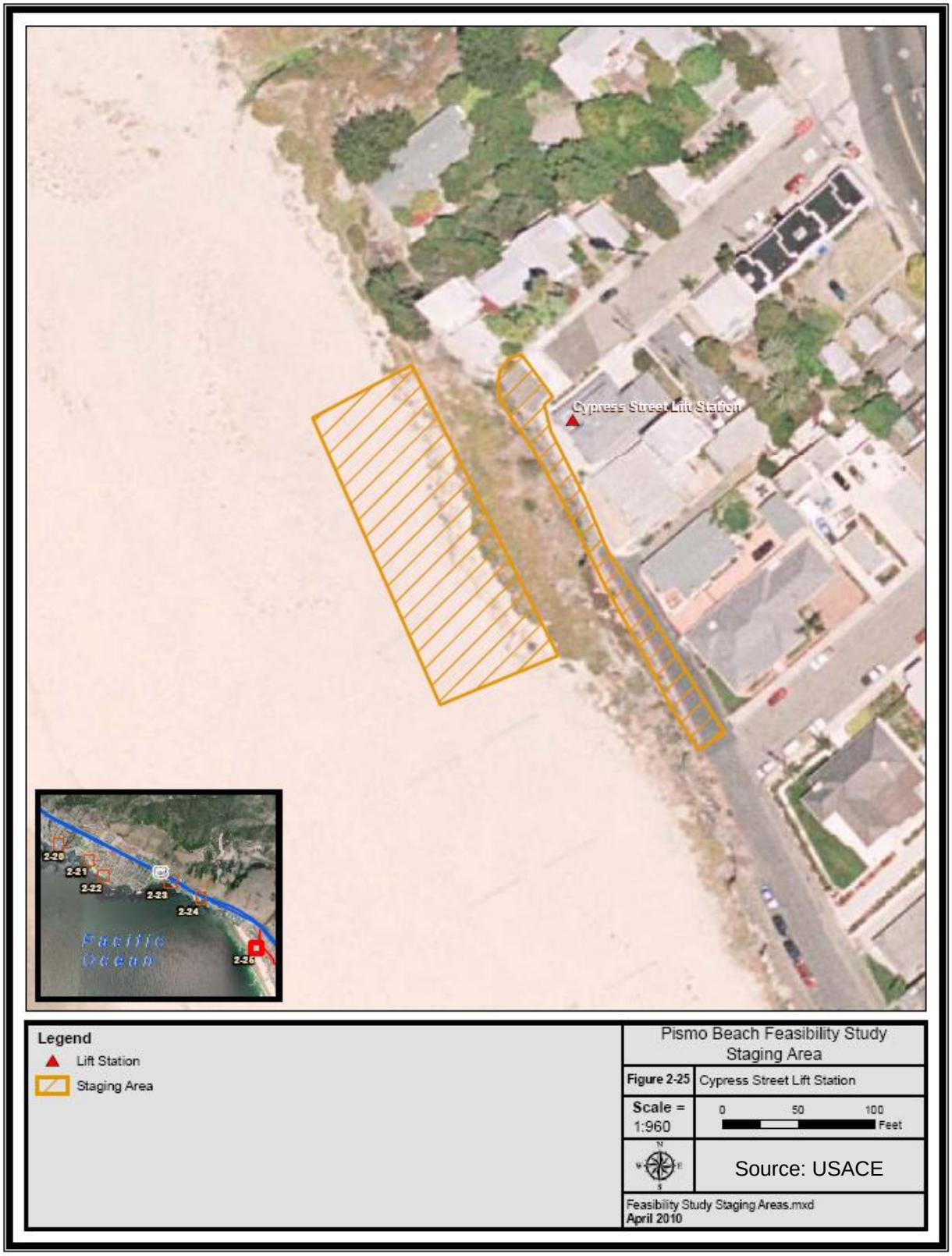


Table 2-3:
Construction Details – Truck Trips

Location	Alternative	Number of Truck Trips				Total # of Truck Trips Per Alternative Per Site	Number of Trucking Days		
		Rock Haul Truck Trips	Concrete Truck Trips	Sheetpile Delivery Truck Trips	Soil Haul Truck Trips		Rock Haul Trucking Days *	Concrete Trucking Days**	Soil Haul Trucking Days***
St. Andrews Lift Station	Alt 1	250	0	0	0	250	9	0	0
	Alt 2	60	70	0	40	170	2	2	2
	Alt 3	60	80	0	40	180	2	2	2
Vista del Mar Lift Station	Alt 1	200	0	0	0	200	7	0	0
	Alt 2	50	50	0	30	130	2	2	1
	Alt 3	50	60	0	30	140	2	2	1
Ocean Park	Alt 1	180	0	0	0	180	6	0	0
	Alt 2	40	80	0	30	150	2	2	1
	Alt 3	40	90	0	30	160	2	3	1
Price St - North	Alt 1	420	0	0	0	420	14	0	0
	Alt 2	90	220	0	70	380	3	6	3
	Alt 3	90	230	0	70	390	3	6	3
Price St - South	Alt 1	260	0	0	0	260	9	0	0
	Alt 2	60	130	0	70	260	2	4	3
	Alt 3	60	150	0	70	280	2	4	3
Cypress Street Lift Station	Alt 1	1,040	280	0	0	1,320	35	7	0
	Alt 4	220	280	20	0	520	8	7	0

** based on 30 rock trucks per day*
*** based on 40 concrete trucks per day*
**** based on 30 soil trucks per day*

Figure 2-26:
St. Andrews Lift Station Haul Route

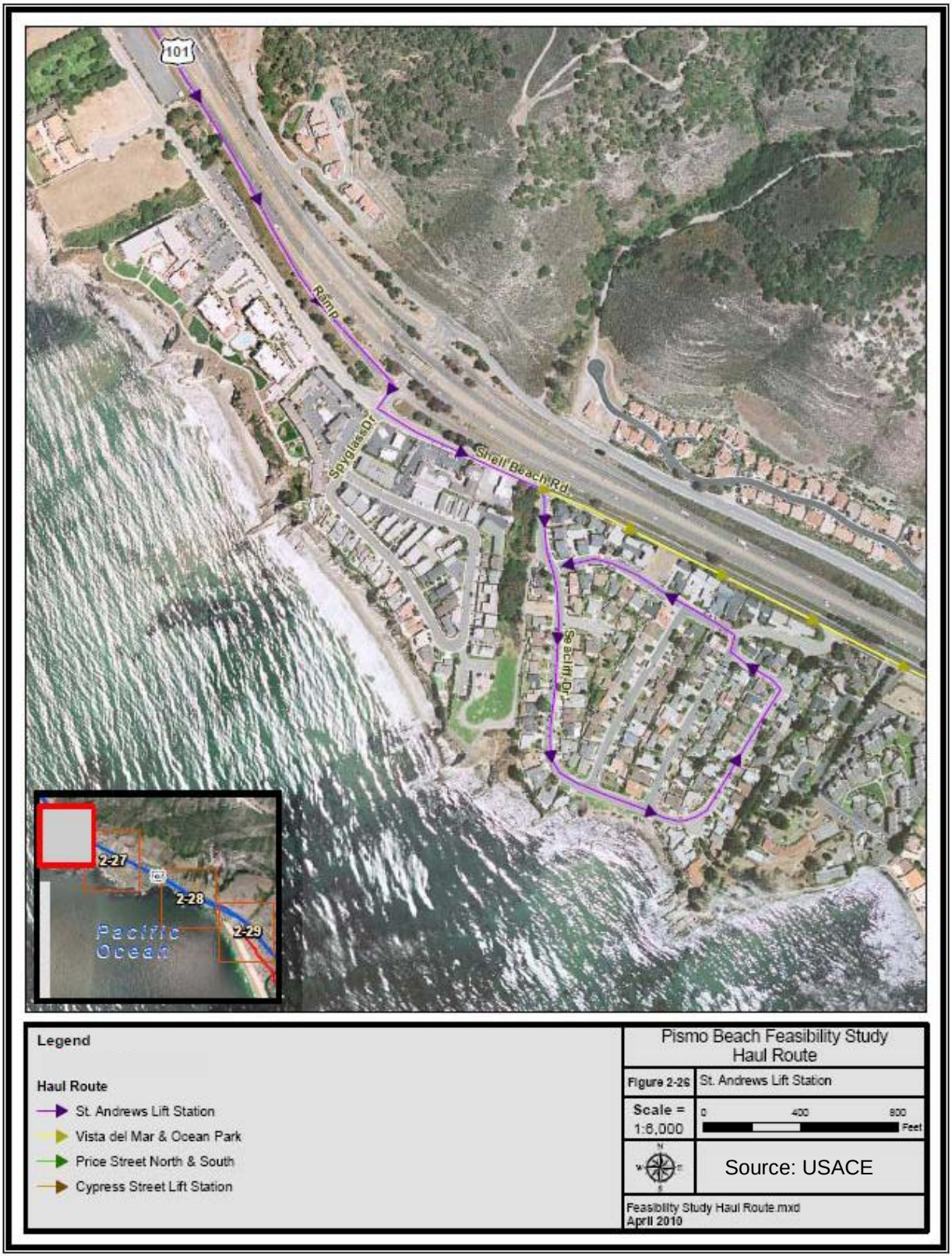


Figure 2-27:
Vista del Mar Lift Station and Ocean Park Haul Route

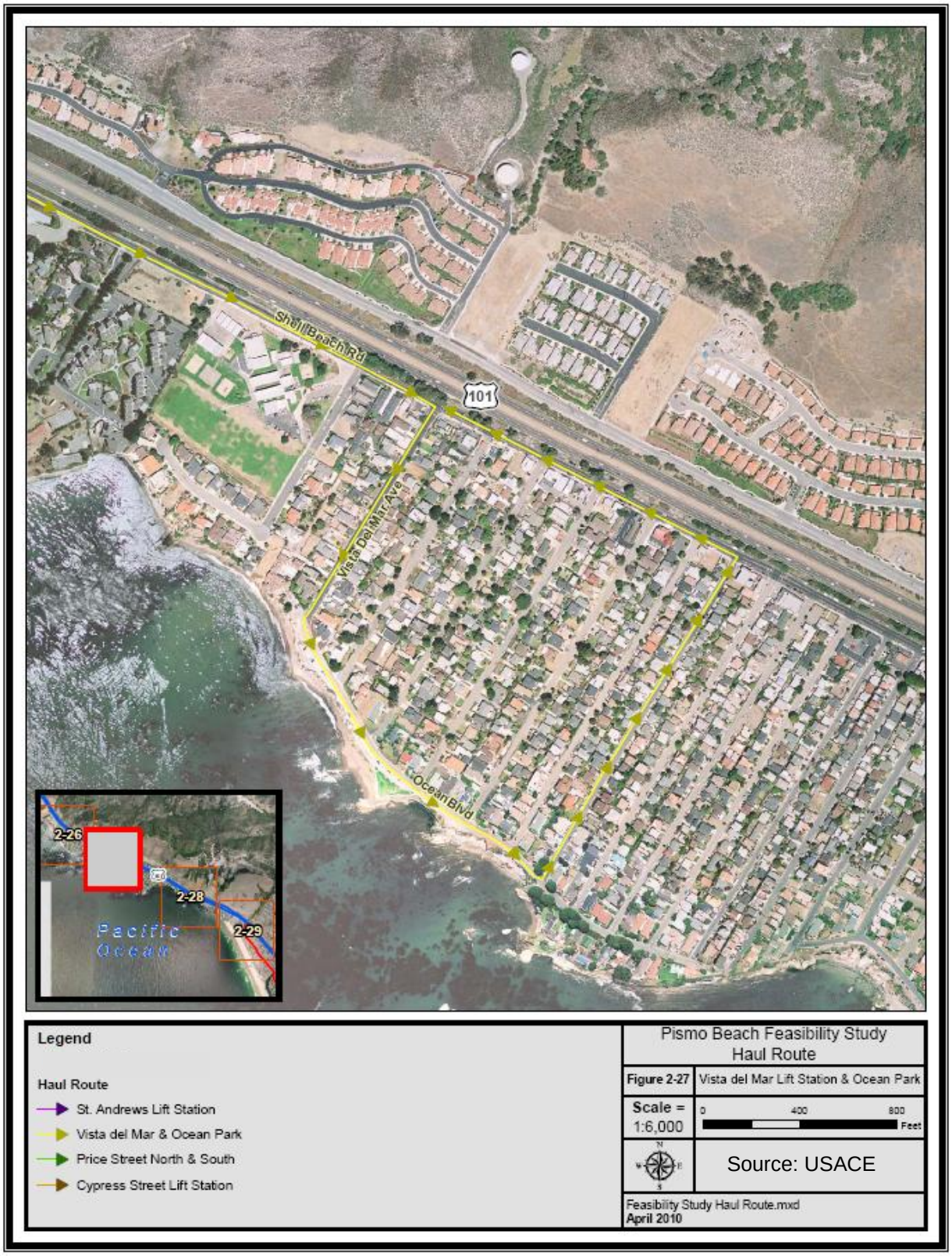


Figure 2-28:
Price Street - North and Price Street - South Haul Route

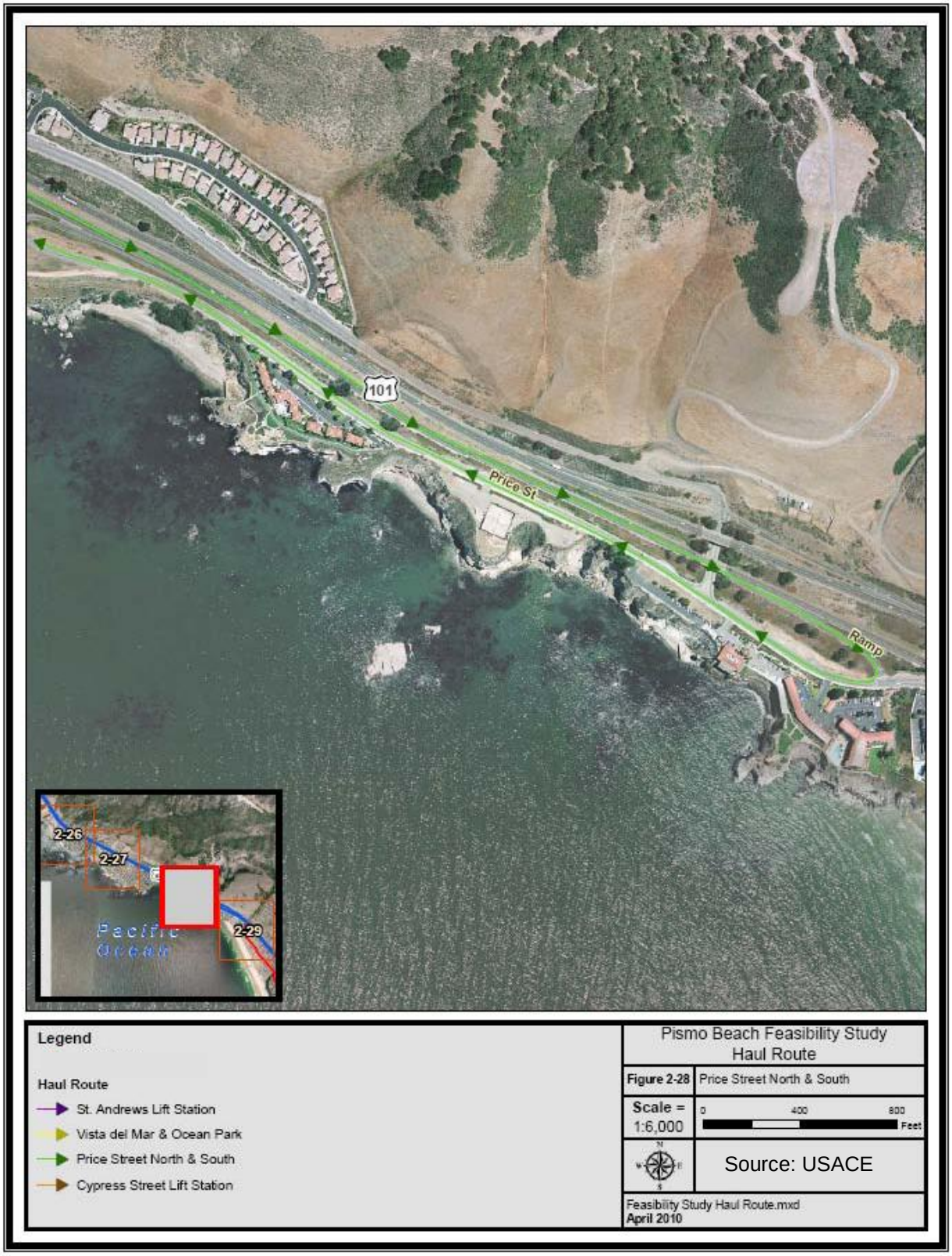
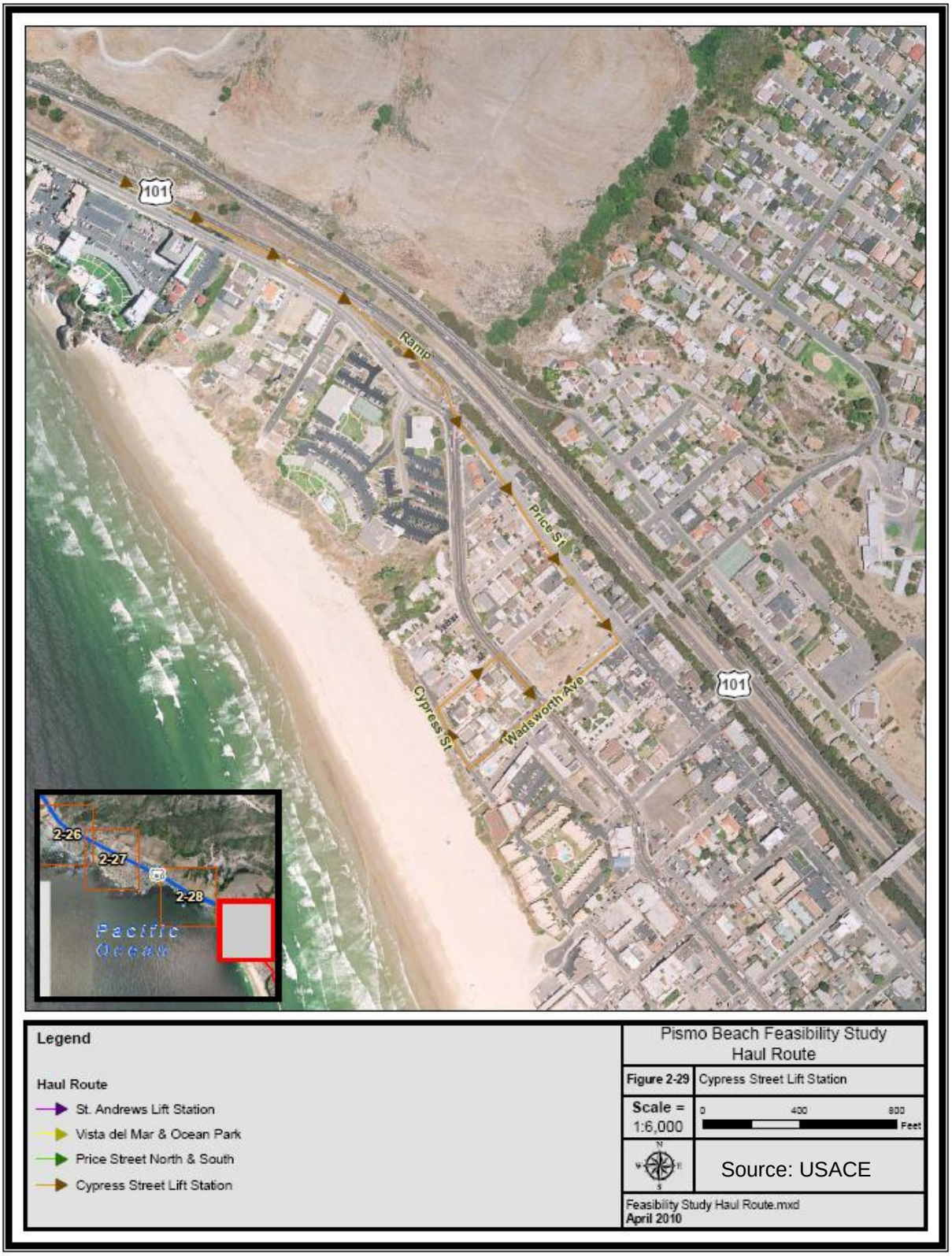


Figure 2-29:
Cypress Street Lift Station Haul Route



SECTION 3.0 – DESCRIPTION OF OTHER ALTERNATIVES

3.1 NO ACTION

Under the No Action alternative, the bluffs at the six eroding sites in Pismo Beach would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the construction of sea walls and/or revetment without proper planning or technical or environmental review.

3.2 OTHER ALTERNATIVES CONSIDERED

3.2.1 Offshore Breakwater

Offshore breakwaters protect shorelines by reducing wave energy and the transport of sand off the beach. An offshore breakwater was not considered further for shore protection at Pismo Beach because breakwater construction would impact numerous valuable coastal resources, including surf grass, kelp beds that provide habitat for the federally threatened sea otter, and offshore rocks that provide seabird roosting sites and harbor seal haul-out sites. In addition, the use of an offshore breakwater for shore protection would require sand nourishment for bluff toe protection from high water levels. Sand nourishment would have additional impacts compared to the structure itself. Because of these environmental impacts and uncertain effectiveness of the offshore breakwater in protecting the bluffs, with or without the additional required sand nourishment, this alternative was eliminated from further consideration.

3.2.2 Groin

Groins provide shore protection by holding sand on the beach in their lee. However, like the offshore breakwater alternative, construction of a groin in the intertidal/shallow subtidal has the potential to impact valuable marine resources, including kelp and surfgrass. Furthermore, groins are dependent upon longshore sediment transport to retain sand in the area that needs protection. Very little sediment transport occurs in the Project area. Therefore, groins would not provide the necessary bluff protection to meet the Project purpose and need. Because of the environmental impacts and the fact that groins would be ineffective in protecting the bluffs, this alternative was eliminated from further consideration.

3.2.3 Beach Nourishment

Sand nourishment often is used to create wide, sandy beaches that provide bluff protection under severe storm wave conditions. However, it would not be practical to attempt to establish a wide, sandy beach along the base of the Pismo Beach sites because of the high wave energy in this area and the fact that the wave energy is directed strongly south. These large, southerly waves would transport the sand rapidly away from the study sites toward Pismo State Beach. In other words, the natural erosional state of the Project area precludes wide, sandy beaches. This alternative was not analyzed further because the sand would not be retained long enough to provide reliable bluff protection.

3.2.4 Managed Retreat

Managed retreat would consist of relocation of the lift stations, other utilities, and roadways. Managed retreat would not be a practical or cost effective alternative because the cost of purchasing private land to relocate infrastructure, the cost of relocating lift stations, utilities and transportation rights of way, repaving roadways, and planning and documentation would be significantly more than the recommended plan and would have a benefit to cost ratio significantly less than one. Because of the unfavorable benefit to cost ratio, the USACE would not be able to participate in a managed retreat project. Additionally, the City of Pismo Beach cannot afford to relocate the lift stations and could not support a managed retreat alternative on their own.

SECTION 4.0 – ENVIRONMENTAL SETTING AND ENVIRONMENTAL CONSEQUENCES

4.1 GEOLOGY

4.1.1 Environmental Setting

4.1.1.1 Physical Setting and Topography

The Project area is located along the shoreline in the northern portion of the City of Pismo Beach in San Luis Obispo County, California (Figure 1-1 and Figure 1-2). Pismo Beach is situated on a narrow marine terrace bordered by the beach and ocean on one side and the hills on the other. The shoreline of Pismo Beach consists of wide, sandy beach at the southern end and high seacliffs, rocky coast, and narrow beaches at the northern end. The seacliffs are in an active state of erosion and vary in height from 10 feet to over 100 feet above low, crested beach berms (USACE 2002).

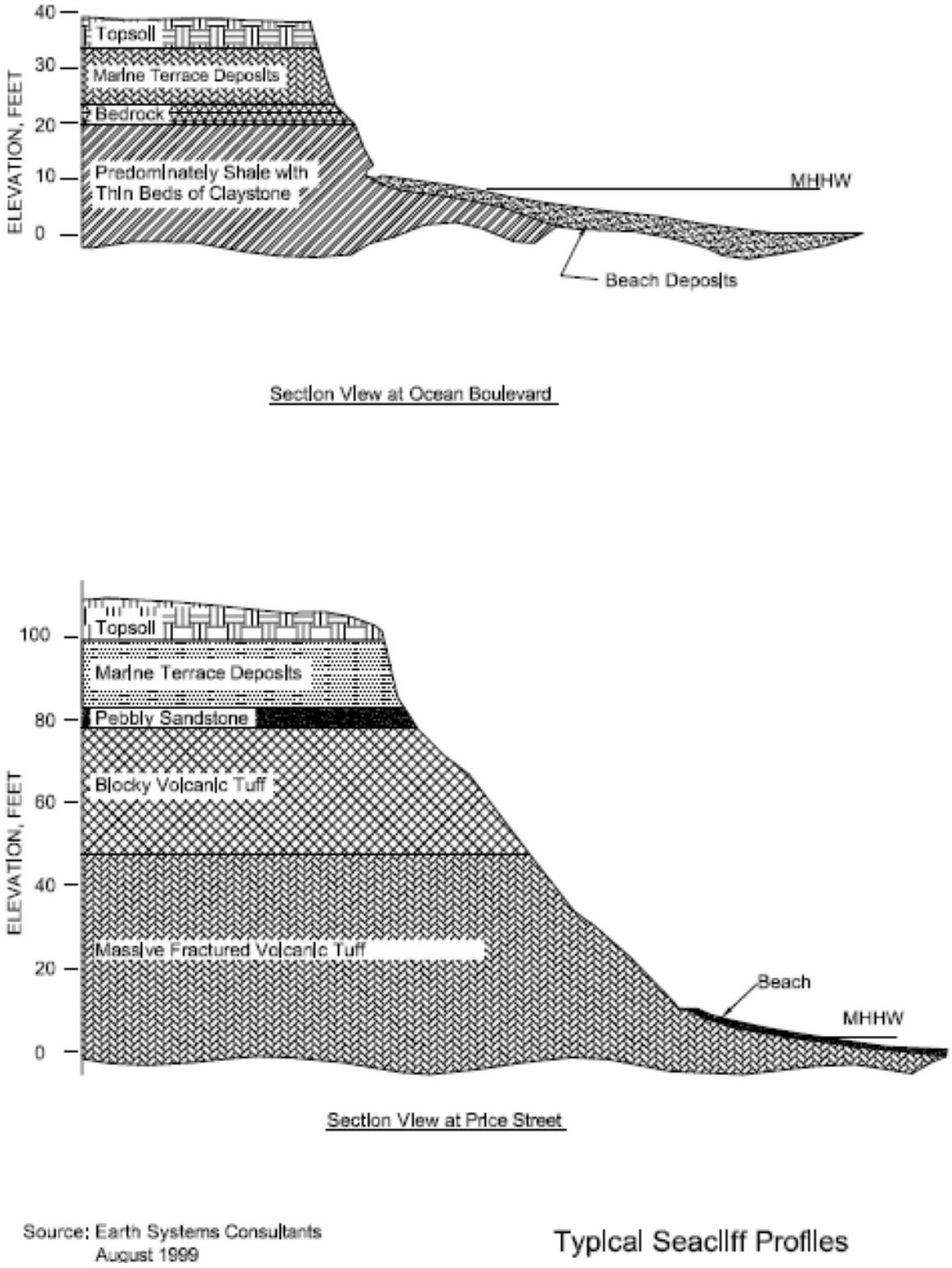
Geology

Pismo Beach is located along the southwest flank of the San Luis Range within the southern end of the Coast Range Province (USACE 2002). This geologic unit consists of northwest oriented ridges and valleys. The mountains have an average elevation of 2,000 feet and are separated from the ocean by a narrow wave-cut terrace that abruptly ends as seacliffs at the shoreline. The two major rock types that predominate throughout the province are Jurassic through Pleistocene sedimentary rocks and the Franciscan Formation and associated granitic-like rocks (USACE 2002).

The Project area consists of the eroding cliffs and intertidal beach and rocks along the northern Pismo Beach shoreline. A broad, sandy beach extends along the southern portion of the Project area to approximately the northern end of Pismo State Beach. The remainder of the Project area consists of rocky coast with narrow pocket beaches, prominent headlands and offshore rocks, islets, and reefs. The numerous small embayments contain thin lenses of steeply sloping profiles of coarse sand and cobble that overlie a shallow bedrock nearshore platform (USACE 2002). The beaches are formed by sand deposited on top of the wave-cut platforms by the ocean currents. The cliffs in the Project area are eroding from wave activity during storms, drainage from the clifftops, and related development activities (City of Pismo Beach 1993).

The geology of the seacliffs in the Project area varies with location (USACE 2002) (Figure 4-1). In the southern portions of the Project area along Price Street, the base of the bluff consists of volcanic tuff overlain by sandstone and marine terrace deposits. To the northwest in the Shell Beach portion of the Project area, the foundation material consists of Monterey shale. The base rock is interbedded with soft, fractured, and highly erodible clay stone. Marine terrace sediments cap the upper portion of the section.

Figure 4-1:
Typical Seacliff Profiles



Source: Earth Systems Consultants
August 1999

Typical Seacliff Profiles

Soils

The soils mapped in the Project area are shown in Figure 4-2. Two soils types are dominant along the Project area shoreline: beach sand and the Still gravelly sandy clay loam soil type (USDA Natural Resources Conservation Service 2009). Beach sand is mapped in the southern portion of the Project area between Cypress Street and the northern end of Pismo State Beach. Beach sand also is mapped in the pocket beach in front of the Price Street - North site. The soil mapped in the rest of the Project area is the Still gravelly sandy clay loam soil type, which is characteristic of the bluff areas.

Faults

The City of Pismo Beach is located in a seismically active area, but no active faults are known to be present within Pismo Beach (City of Pismo Beach 1993). The closest faults with reported historic seismic activity are the offshore and northern San Luis Obispo County faults within the Hosgri-San Simeon fault zone, the active Los Osos fault zone that is mapped along Los Osos Valley Road, the Oceano fault, and the San Andreas fault mapped along the boundary of eastern San Luis Obispo County (Fugro West 2002).

4.1.2 Environmental Consequences

4.1.2.1 Significance Criteria

An impact to geology will be considered significant if:

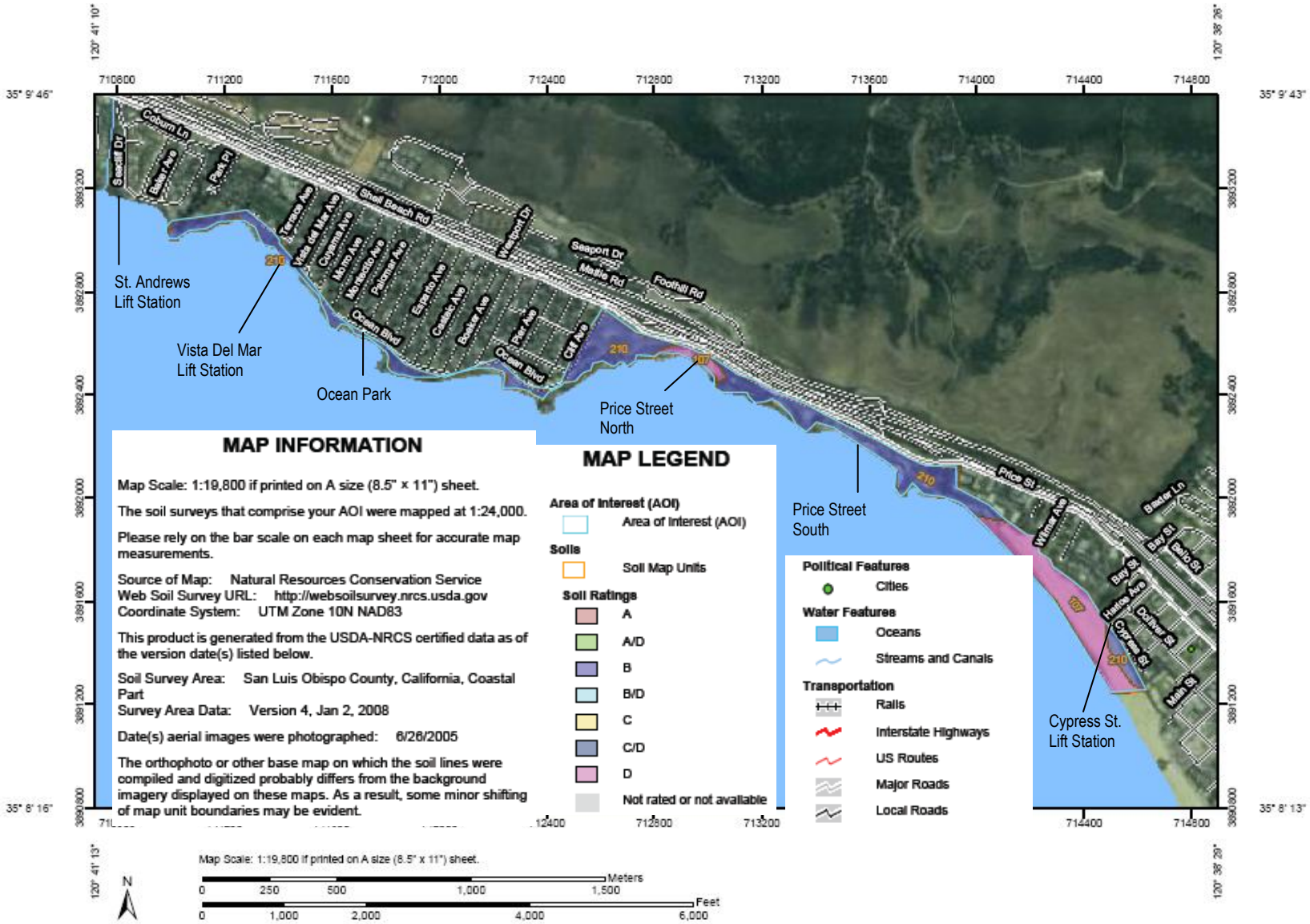
- unique geologic features were adversely affected;
- known mineral resources were rendered inaccessible;
- a geologic process such as landsliding or erosion were triggered or accelerated; or
- substantial alteration of topography occurred.

4.1.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

The bluffs at the St. Andrews Lift Station site are experiencing severe erosion. The erosion has exposed pipes. A seawall has been constructed to protect the bluffs, but erosion is still occurring. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that currently is occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a revetment at the St. Andrews Lift Station would be insignificant.

Figure 4-2:
Soils Map



Alternative 2: Vertical Sea Wall

The impacts to geology of a vertical sea wall at the St. Andrews Lift Station site would be similar to those of the rock revetment. Construction of a vertical sea wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The vertical sea wall would help to halt the erosion that currently is occurring. The sea wall would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. As was true of the revetment, the length of the seawall was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a vertical sea wall at the St. Andrews Lift Station would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to geology of a sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be the same as those of a vertical sea wall and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluff at the St. Andrews Lift Station site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an emergency revetment or seawall were constructed to reduce erosion at the site, it might not be designed to prevent flanking and scour around the end of the structure.

4.1.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

The bluffs at the Vista del Mar Lift Station site are experiencing severe erosion. The erosion has exposed pipes. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that is currently occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a revetment at the Vista del Mar Lift Station would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to geology of a vertical sea wall at the Vista del Mar Lift Station site would be similar to those of the rock revetment. Construction of a vertical sea wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The vertical sea wall would help to halt the erosion that is currently occurring. The sea wall would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. Like the revetment, the alongshore length of the sea wall at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion

around the end of the structure. The impacts to geology of a vertical sea wall at the Vista del Mar Lift Station would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to geology of a sculpted concrete/shotcrete wall at the Vista del Mar Lift Station site would be the same as those of a vertical sea wall and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluff at the Vista del Mar Lift Station site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an emergency revetment or seawall were constructed to reduce erosion at the site, it might not be designed to prevent flanking and scour around the end of the structure.

4.1.2.4 Ocean Park

Alternative 1: Rock Revetment

The bluffs at the Ocean Park site are experiencing severe erosion. A seawall has been constructed to protect the bluffs below a house adjacent to the site. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that currently is occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a revetment at the Ocean Park site would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to geology of a vertical sea wall at the Ocean Park site would be similar to those of the rock revetment. Construction of a vertical sea wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The vertical sea wall would help to halt the erosion that is currently occurring. The sea wall would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the sea wall at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a vertical sea wall at the Ocean Park site would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to geology of a sculpted concrete/shotcrete wall at the Ocean Park site would be the same as those of a vertical sea wall and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluff at the Ocean Park site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an emergency revetment or seawall were constructed to reduce erosion at the site, it might not be designed to prevent flanking and scour around the end of the structure.

4.1.2.5 Price Street – North

Alternative 1: Rock Revetment

The bluffs at the Price Street -North site are experiencing severe erosion. A revetment has been constructed at the foot of the bluffs, but erosion is still occurring. The proposed revetment would replace the existing undersized, ineffective revetment and would be properly designed to substantially reduce erosion at this site. Some of the stone from the existing revetment may be salvaged for the new revetment. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that is currently occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a revetment at the Price Street - North site would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to geology of a vertical sea wall at the Price Street - North site would be similar to those of the rock revetment. Construction of a vertical sea wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The vertical sea wall would help to halt the erosion that is currently occurring. The sea wall would replace the existing ineffective revetment. The sea wall would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the sea wall at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a vertical sea wall at the Price Street - North site would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to geology of a sculpted concrete/shotcrete wall at the Price Street - North site would be the same as those of a vertical sea wall and would be insignificant. The new sea wall would replace the existing ineffective sea wall.

No Action Alternative

Under the No Action alternative, the bluff at the Price Street - North site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an additional emergency revetment or seawall were constructed to reduce

erosion at the site, it might not be designed to prevent flanking and scour around the end of the structure.

4.1.2.6 Price Street – South

Alternative 1: Rock Revetment

The bluffs at the Price Street - South site are experiencing severe erosion. A small crib wall has been constructed to protect the top bluffs, but wave erosion is still occurring. The new revetment would protect the base of the bluffs, and the existing crib wall would remain in place. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that is currently occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a revetment at the Price Street - South site would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to geology of a vertical sea wall at the Price Street - South site would be similar to those of the rock revetment. Construction of a vertical sea wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The vertical sea wall would help to halt the wave erosion that currently is occurring at the base of the bluff. The existing crib wall is designed to reduce erosion at the top of the bluffs and would remain in place. The new sea wall would be confined to the area necessary to stop the severe erosion and would not create a substantial alteration of topography. The alongshore length of the new sea wall at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a vertical sea wall at the Price Street - South site would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to geology of a sculpted concrete/shotcrete wall at the Price Street - South site would be the same as those of a vertical sea wall and would be insignificant. The existing crib wall at the top of the bluff would remain in place.

No Action Alternative

Under the No Action alternative, the bluff at the Price Street - South site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an emergency revetment or seawall were constructed to reduce erosion at the site, it might not be designed to prevent flanking and scour around the end of the structure.

4.1.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The bluffs at Cypress Street Lift Station are experiencing severe erosion. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that is currently occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not create a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a revetment at the Cypress Street Lift Station site would be insignificant.

Alternative 4: Steel Sheet Pile Wall

The impacts to geology of a steel sheet pile wall at the Cypress Street Lift Station site would be similar to those of the rock revetment. Construction of a steel sheet pile wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The steel sheet pile wall would help to halt the erosion that currently is occurring. The steel sheet pile wall would be confined to the area necessary to stop the severe erosion and would not create a substantial alteration of topography. The alongshore length of the sheet pile wall at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a steel sheet pile wall at the Cypress Street Lift Station site would be insignificant.

No Action Alternative

Under the No Action alternative, the bluff at the Cypress Street Lift Station site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an emergency revetment or seawall were constructed to reduce erosion at the site, it might not be designed to prevent flanking and scour around the end of the structure.

4.2 OCEANOGRAPHY AND WATER QUALITY

4.2.1 Environmental Setting

4.2.1.1 Tides

Tides along the central California coast are of the mixed-semidurnal type. A typical 24-hour day will have two high and two low tides, each of different magnitude.

Table 4-1 shows tides at nearby Port San Luis (Fugro West 2002).

Table 4-1: Tidal Characteristics at Port San Luis Wharf

Datum or Level	Elevation (ft. MLLW)
Highest Measured Water Level (January, 1973)	**7.77**
Mean Higher High Water (MHHW)	5.39
Mean High Water (MHW)	4.68
Mean Tide Level (MTL)	2.83
National Geodetic Vertical datum -1929 (NGVD)	2.73
Mean Low Water (MLW)	1.04
Mean Lower Low Water (MLLW)	0.00
Lowest Measured Water Level (January, 1951)	-2.20

4.2.1.2 Waves

Wind waves and swells along the central California coast generally are produced by six basic meteorological patterns: 1) extratropical storm swells in the northern hemisphere (north or northwest swell); 2) wind swells generated by northwest winds in the outer coastal waters (wind swell); 3) westerly (west sea); 4) southeasterly (southeast sea) local seas; 5) storm swells of tropical storms or hurricanes off the Mexican coast; and 6) southerly swells originating in the southern hemisphere (USACE 2002).

Extratropical storm swells (north or northwest swell) have the greatest influence of the various weather patterns along the central California coast. These extratropical storm swells are the source of the predominant wave action during the winter. The extratropical cyclone of the Northern Hemisphere is related to low pressure centers that develop along the polar front. Storm swells are generated some distance from the central California coast in the North Pacific. Usually, these storms will traverse the mid-Pacific before turning northeastward toward the Gulf of Alaska, with swell decaying on the average of 1,500 miles to the coast of central California. However, under some weather conditions, storms can move in much closer to the coast, and on rare occasions may move directly across central California, following a northeast, east or southeast trajectory.

In general, the modal deep-water approach direction of these waves to central California is between 275º and 285º. However, these North Pacific low-pressure systems exhibit considerable variation from year to year. In seasons when the storm centers follow a more northerly route in the eastern Pacific, wave conditions will be quiet in the Pismo Beach area (USACE 2002). Pismo Beach is protected from northwesterly swells by the coastline near Port San Luis (Fugro West 2002). More southerly storm tracks through the mid and/or eastern Pacific will result in frequent periods of high wave conditions. The largest winter waves come from almost due west (270º). In contrast, during the summer months, a smaller secondary peak occurs from Southern Hemisphere swell.

4.2.1.3 Currents

Nearshore currents in the Project area are predominantly from north to south because of the prevailing northwesterly wave and wind approach direction (USACE 2002). Velocities may

range from 5 to 50 centimeters per second. Wind-driven currents may be strong enough to transport significant amounts of sediment.

4.2.1.4 Littoral Processes

The Pismo Beach shoreline is located within the Santa Maria littoral cell which extends from Point Buchon in the north to Point Conception at the southern end (USACE 2002). In spite of the high wave energy along the central California coast, the general shore normal orientation of the beaches results in relatively low net littoral transport rates. The estimated net alongshore rate is 40,000 to 65,000 cubic yards of sediment per year. The predominate direction of transport is downcoast (southeast).

Sediment sources to the littoral sub-cell are limited to delivery from nearby creeks, material derived from seacliff erosion, and a possible net onshore transport component that may exist further south within the sub-cell (USACE 2002). About 8,000 cubic yards per year has been estimated to be delivered from upcoast creeks and rivers. A minor amount of sediment is thought to be contributed by bluff erosion due to the remnant sand content contained in the sloughed marine terrace deposits.

The beaches in the Project area consist of thin lenses of sand overlying bedrock (USACE 2002). Sediment probes measured at several sites in the Project area during a March 2000 reconnaissance survey indicated that the sand and cobble thickness was only two to three feet (USACE 2002). Because of the thin layer of sediment cover, the beaches in the Project area would be expected to experience significant seasonal changes as sand moves inshore and offshore in response to changes in the wave climate. The energetic winter sea and swell carries the sand offshore, leaving the rocky nearshore platform exposed. During the calmer and longer period wave environment of summer and early fall, onshore sand transport and beach re-building occurs.

4.2.1.5 Water Quality

Waterbodies in Pismo Beach fall under the jurisdiction of the California Regional Water Quality Control Board, Central Coast Region (RWQCB). The RWQCB sets water quality objectives and beneficial uses for surface and ground water in the Central Coast Water Quality Control Plan (RWQCB 1994). Designated beneficial uses of coastal waters between Point San Luis and Point Sal include contact and non-contact water recreation (REC-1, REC-2); industrial service supply (IND); navigation (NAV); marine habitat (MAR); shellfish harvesting (SHELL); commercial and sports fishing (COMM); rare, threatened, or endangered species (RARE); and wildlife habitat (WILD).

Ocean water quality in the Project area is generally good. When a waterbody is not meeting established water quality standards, it is placed on an impaired waters list mandated by Section 303(d) of the Clean Water Act. The Pacific Ocean at Pismo Beach is on the California 303(d) list of impaired waterbodies for indicator bacteria from an unknown source (State Water Resources Control Board 2006).

4.2.2 Environmental Consequences

4.2.2.1 Significance Criteria

An impact to oceanography will be considered significant if alteration of water quality results in:

- deleterious effects on human, animal, or plant life;
- substantial impairment of beneficial recreational use of the beach and/or ocean;
- exceedances of water quality objectives from the California Ocean Plan; creation of pollution, contamination; or
- a nuisance as defined in Section 13050 of the California Water Code.

4.2.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

Construction of the rock revetment will require construction equipment to work close to the ocean. Spills or leaks from this equipment could introduce fuels, lubricants, or other contaminants to the ocean. If an accident occurred, a substantial amount of fuel could spill into the ocean. A large fuel spill could result in deleterious effects on marine life, including potential oiling of plants or animals, as well as substantial impairment of beneficial recreational use of the ocean. In addition, a substantial spill could result in exceedance of standards in the California Ocean Plan, such as visible oil and grease. The potential impact of spills and leaks could be mitigated to insignificant through implementation of the following mitigation measure:

- Preparation and adherence to a Spill Prevention, Containment and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill.
    - Construction and maintenance fluids (oils, antifreeze, fuels) shall be stored in closed containers and disposed of promptly away from the ocean.
    - Fluids released because of spills, equipment failure (broken hose, punctured tank), or accident due to waves or refueling should be immediately controlled, contained, and cleaned-up. All contaminated materials should be disposed of promptly away from the ocean. Equipment refueling shall not occur close to the ocean. If that is not possible, barriers shall be placed around the site.

In addition, construction work near the ocean could result in debris or dirt entering the ocean. Significant debris or dirt would degrade the beneficial uses of nearshore ocean waters. The potential impact of dirt or debris could be mitigated to insignificant through implementation of the following mitigation measure:

- Preparation and adherence to a Storm Water Pollution Prevention Plan. This plan shall specify Best Management Practices (BMPs), including collection and storage of all debris

away from the ocean and erosion control measures to prevent dirt or construction materials from entering the ocean.

Once construction is completed, the revetment would slow or halt bluff erosion in a localized area. Bluff erosion contributes very little sediment to Project area beaches because, based on visual observations, less than half of the bluff sediment consists of sand-sized particles (Moffat and Nichol 2010). Therefore, revetment construction at the St. Andrews Lift Station site would not result in measurable loss of sediment at Project area beaches. When the bluff faces erode, they become silt, which washes out to the deeper ocean depths. Therefore, bluff protection by construction of a rock revetment would have a minor beneficial effect on ocean water quality by slightly reducing the amount of silt that enters the ocean.

Alternative 2: Vertical Sea Wall

The impacts to oceanography and water quality of a vertical sea wall at the St. Andrews Lift Station site would be similar to those of a rock revetment. During construction of the vertical sea wall, potential would be present for degradation of water quality and ocean beneficial uses due to leaks and spills from construction equipment, debris, and erosion. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for this site.

Once the sea wall is constructed, it will slow or prevent bluff erosion at the St. Andrews Lift Station site. Vertical sea wall construction at the St. Andrews Lift Station site would not result in measurable loss of sediment at Project area beaches. Bluff toe protection at this site would result in a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion into ocean waters.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to oceanography and water quality at the St. Andrews Lift Station site would be the same as for the rock revetment and the vertical sea wall. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for this site. Bluff protection would result in a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion into ocean waters.

No Action Alternative

Under the No Action alternative, the bluff face at the St. Andrews Lift Station site will continue to erode and introduce silt into the ocean. The introduction of silt to ocean water constitutes a minor adverse impact to water quality because silt can interfere with the feeding and breathing of marine organisms and can reduce kelp recruitment by coating rocks. However, the amount of silt from bluff erosion at this site is minor. Only a small portion of the sediment that enters the ocean from bluff erosion is sand-sized. Therefore, the contribution of bluff erosion to Project area beaches under the No Action alternative is minor.

4.2.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

Construction of the rock revetment will require construction equipment to work close to the ocean. Spills or leaks from this equipment could introduce fuels, lubricants, or other contaminants to the ocean. If an accident occurred, a substantial amount of fuel could spill into the ocean. A large fuel spill could result in deleterious effects on marine life, including potential oiling of plants or animals, as well as substantial impairment of beneficial recreational use of the ocean. In addition, a substantial spill could result in exceedance of standards in the California Ocean Plan, such as visible oil and grease. In addition, construction work near the ocean could result in debris or dirt entering the ocean. Significant debris or dirt would degrade the beneficial uses of nearshore ocean waters. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once construction is completed, the revetment would slow or halt bluff erosion in a localized area. Bluff erosion contributes very little sediment to Project area beaches because, based on visual observations, less than half of the bluff sediment consists of sand-sized particles (Moffat and Nichol 2010). Therefore, revetment construction at the Vista del Mar Lift Station site would not result in measurable loss of sediment at Project area beaches. When the bluff faces erode, they become silt, which washes out to the deeper ocean depths. Therefore, bluff protection by construction of a rock revetment would have a minor beneficial effect on ocean water quality by slightly reducing the amount of silt that enters the ocean.

Alternative 2: Vertical Sea Wall

The impacts to oceanography and water quality of a vertical sea wall at the Vista del Mar Lift Station site would be similar to those of a rock revetment. During construction of the vertical sea wall, potential would be present for degradation of water quality and ocean beneficial uses due to leaks and spills from construction equipment, debris, and erosion. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once the sea wall is constructed, it will slow or prevent bluff erosion at the Vista del Mar Lift Station site. Vertical sea wall construction at the site would not result in measurable loss of sediment at Project area beaches. Bluff toe protection at this site would result in a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion into ocean waters.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to oceanography and water quality at the Vista del Mar Lift Station site would be the same as the rock revetment and the vertical sea wall. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site. The impacts after construction would be a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion to ocean waters.

No Action Alternative

Under the No Action alternative, the bluff face at the Vista del Mar Lift Station site will continue to erode and introduce silt into the ocean. The introduction of silt to ocean water constitutes a minor adverse impact to water quality because silt can interfere with the feeding and breathing of marine organisms and can reduce kelp recruitment by coating rocks. However, the amount of silt from bluff erosion at this site is minor. Only a small portion of the sediment that enters the ocean from bluff erosion is sand-sized. Therefore, the contribution of bluff erosion to Project area beaches under the No Action alternative is minor.

4.2.2.4 Ocean Park

Alternative 1: Rock Revetment

Construction of the rock revetment will require construction equipment to work close to the ocean. Spills or leaks from this equipment could introduce fuels, lubricants or other contaminants to the ocean. If an accident occurred, a substantial amount of fuel could spill into the ocean. A large fuel spill could result in deleterious effects on marine life, including potential oiling of plants or animals, as well as substantial impairment of beneficial recreational use of the ocean. In addition, a substantial spill could result in exceedance of standards in the California Ocean Plan, such as visible oil and grease. In addition, construction work near the ocean could result in debris or dirt entering the ocean. Significant debris or dirt would degrade the beneficial uses of nearshore ocean waters. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once construction is completed, the revetment would slow or halt bluff erosion in a localized area. Bluff erosion contributes very little sediment to Project area beaches because, based on visual observations, less than half of the bluff sediment consists of sand-sized particles (Moffat and Nichol 2010). Therefore, revetment construction at the Ocean Park site would not result in measurable loss of sediment at Project area beaches. When the bluff faces erode, they become silt, which washes out to the deeper ocean depths. Therefore, bluff protection by construction of a rock revetment would have a minor beneficial effect on ocean water quality by slightly reducing the amount of silt that enters the ocean.

Alternative 2: Vertical Sea Wall

The impacts to oceanography and water quality of a vertical sea wall at the Ocean Park site would be similar to those of a rock revetment. During construction of the vertical sea wall, potential would be present for degradation of water quality and ocean beneficial uses due to leaks and spills from construction equipment, debris, and erosion. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once the sea wall is constructed, it will slow or prevent bluff erosion at the Ocean Park site. Vertical sea wall construction at the site would not result in measurable loss of sediment at

Project area beaches. Bluff toe protection at this site would result in a minor beneficial effect of reducing the introduction of silt from bluff erosion into ocean waters.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to oceanography and water quality at the Ocean Park site would be the same as the rock revetment and the vertical sea wall. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site. The impacts after construction would be a minor beneficial effect of reducing the introduction of silt from bluff erosion into ocean waters.

No Action Alternative

Under the No Action alternative, the bluff face at the Ocean Park site will continue to erode and introduce silt into the ocean. The introduction of silt to ocean water constitutes a minor adverse impact to water quality because silt can interfere with the feeding and breathing of marine organisms and can reduce kelp recruitment by coating rocks. However, the amount of silt from bluff erosion at this site is minor. Only a small portion of the sediment that enters the ocean from bluff erosion is sand-sized. Therefore, the contribution of bluff erosion to Project area beaches under the No Action alternative is minor.

4.2.2.5 Price Street – North

Alternative 1: Rock Revetment

Construction of the rock revetment will require construction equipment to work close to the ocean. Spills or leaks from this equipment could introduce fuels, lubricants, or other contaminants to the ocean. If an accident occurred, a substantial amount of fuel could spill into the ocean. A large fuel spill could result in deleterious effects on marine life, including potential oiling of plants or animals, as well as substantial impairment of beneficial recreational use of the ocean. In addition, a substantial spill could result in exceedance of standards in the California Ocean Plan, such as visible oil and grease. In addition, construction work near the ocean could result in debris or dirt entering the ocean. Significant debris or dirt would degrade the beneficial uses of nearshore ocean waters. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once construction is completed, the revetment would slow or halt bluff erosion in a localized area. Bluff erosion contributes very little sediment to Project area beaches because, based on visual observations, less than half of the bluff sediment consists of sand-sized particles (Moffat and Nichol 2010). Therefore, revetment construction at the Price Street - North site would not result in measurable loss of sediment at Project area beaches. When the bluff faces erode, they become silt, which washes out to the deeper ocean depths. Therefore, bluff protection by construction of a rock revetment would have a minor beneficial effect on ocean water quality by slightly reducing the amount of silt that enters the ocean.

Alternative 2: Vertical Sea Wall

The impacts to oceanography and water quality of a vertical sea wall at the Price Street - North site would be similar to those of a rock revetment. During construction of the vertical sea wall, there would be a potential for degradation of water quality and ocean beneficial uses from leaks and spills from construction equipment, debris, and erosion. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once the sea wall is constructed, it will slow or prevent bluff erosion at the Price Street - North site. Vertical sea wall construction at the site would not result in measurable loss of sediment at Project area beaches. Bluff toe protection at this site would result in a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion into ocean waters.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to oceanography and water quality at the Price Street - North site would be the same as the rock revetment and the vertical sea wall. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site. The impacts after construction would be a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion to ocean waters.

No Action Alternative

Under the No Action alternative, the bluff face at the Price Street - North site will continue to erode and introduce silt into the ocean. The introduction of silt to ocean water constitutes a minor adverse impact to water quality because silt can interfere with the feeding and breathing of marine organisms and can reduce kelp recruitment by coating rocks. However, the amount of silt from bluff erosion at this site is minor. Only a small portion of the sediment that enters the ocean from bluff erosion is sand-sized. Therefore, the contribution of bluff erosion to Project area beaches under the No Action alternative is minor.

4.2.2.6 Price Street – South

Alternative 1: Rock Revetment

Construction of the rock revetment will require construction equipment to work close to the ocean. Spills or leaks from this equipment could introduce fuels, lubricants, or other contaminants to the ocean. If an accident occurred, a substantial amount of fuel could spill into the ocean. A large fuel spill could result in deleterious effects on marine life, including potential oiling of plants or animals, as well as substantial impairment of beneficial recreational use of the ocean. In addition, a substantial spill could result in exceedance of standards in the California Ocean Plan, such as visible oil and grease. In addition, construction work near the ocean could result in debris or dirt entering the ocean. Significant debris or dirt would degrade the beneficial uses of nearshore ocean waters. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once construction is completed, the revetment would slow or halt bluff erosion in a localized area. Bluff erosion contributes very little sediment to Project area beaches because, based on visual observations, less than half of the bluff sediment consists of sand-sized particles (Moffat and Nichol 2010). Therefore, revetment construction at the Price Street - South site would not result in measurable loss of sediment at Project area beaches. When the bluff faces erode, they become silt, which washes out to the deeper ocean depths. Therefore, bluff protection by construction of a rock revetment would have a minor beneficial effect on ocean water quality by slightly reducing the amount of silt that enters the ocean.

Alternative 2: Vertical Sea Wall

The impacts to oceanography and water quality of a vertical sea wall at the Price Street - South site would be similar to those of a rock revetment. During construction of the vertical sea wall, potential would be present for degradation of water quality and ocean beneficial uses due to leaks and spills from construction equipment, debris, and erosion. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once the sea wall is constructed, it will slow or prevent bluff erosion at the Price Street - South site. Vertical sea wall construction at the site would not result in a measurable loss of sediment at Project area beaches. Bluff toe protection at this site would result in a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion into ocean waters.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to oceanography and water quality at the Price Street - South site would be the same as the rock revetment and the vertical sea wall. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site. The impacts after construction would be a minor beneficial effect of slightly reducing the introduction of silt from bluff erosion to ocean waters.

No Action Alternative

Under the No Action alternative, the bluff face at the Price Street - South site will continue to erode and introduce silt into the ocean. The introduction of silt to ocean water constitutes a minor adverse impact to water quality because silt can interfere with the feeding and breathing of marine organisms and can reduce kelp recruitment by coating rocks. However, the amount of silt from bluff erosion at this site is minor. Only a small portion of the sediment that enters the ocean from bluff erosion is sand-sized. Therefore, the contribution of bluff erosion to Project area beaches under the No Action alternative is minor.

4.2.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

Construction of the rock revetment will require construction equipment to work close to the ocean. Spills or leaks from this equipment could introduce fuels, lubricants, or other contaminants onto the beach or into the ocean. If an accident occurred, a substantial amount of fuel could spill into the ocean. Except for extreme high tide and wave conditions, the wide beach at Cypress Street Lift Station makes the chances of a spill or leak entering ocean waters lower than at the other five sites, but the introduction of pollutants to the ocean from an equipment spill or leak still is possible.

In addition, construction work near the ocean could result in debris or dirt entering the ocean. Significant debris or dirt would degrade the beneficial uses of nearshore ocean waters. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once construction is completed, the revetment would slow or halt bluff erosion in a localized area. Bluff erosion contributes very little sediment to Project area beaches because, based on visual observations, less than half of the bluff sediment consists of sand-sized particles (Moffat and Nichol 2010). Therefore, revetment construction at the Cypress Street Lift Station site would not result in measurable loss of sediment at Project area beaches. When the bluff faces erode, they become silt, which washes out to the deeper ocean depths. Therefore, bluff protection by construction of a rock revetment would have a minor beneficial effect on ocean water quality by slightly reducing the amount of silt that enters the ocean.

Alternative 4: Steel Sheet Pile Wall

The impacts to oceanography and water quality of a steel sheet pile wall at the Cypress Street Lift Station site would be similar to those of a rock revetment. During construction of the steel sheet pile wall, a slight potential would be present for degradation of water quality and ocean beneficial uses due to leaks and spills from construction equipment, debris, and erosion. These impacts could be reduced to insignificant through implementation of mitigation measures identified for the rock revetment alternative for the St. Andrews Lift Station site.

Once the sea wall is constructed, it will slow or prevent bluff erosion at the Cypress Street Lift Station site. Steel sheet pile wall construction at the site would not result in measurable loss of sediment at Project area beaches. Bluff toe protection at this site would result in a minor beneficial effect of reducing the introduction of silt from bluff erosion into ocean waters.

No Action Alternative

Under the No Action alternative, the bluff face at the Cypress Street Lift Station site will continue to erode and introduce silt into the ocean. The wide beach present at this site reduces the likelihood of erosive events to storm events that occur at very high tide stages. The introduction of silt to ocean water constitutes a minor adverse impact to water quality because silt can interfere with the feeding and breathing of marine organisms and can reduce kelp recruitment by coating rocks. However, the amount of silt from bluff erosion at this site is

extremely minor. Only a small portion of the sediment that enters the ocean from bluff erosion is sand-sized. Therefore, the contribution of bluff erosion to Project area beaches under the No Action alternative is negligible.

4.3 AIR QUALITY

4.3.1 Environmental Setting

4.3.1.1 Meteorology

San Luis Obispo County (County) constitutes a land area of approximately 3,316 square miles with varied topography and climate. From a geographical and meteorological standpoint, the County can be divided into three general regions: the Coastal Plateau, the Upper Salinas River Valley, and the East County Plain. Air quality in each of these regions is characteristically different, although the physical features that divide them provide only limited barriers to the transport of pollutants between regions. The proposed Project is located in the Coastal Plateau region.

The Coastal Plateau is about 5 to 10 miles wide and varies in elevation from sea level to about 500 feet. It is bounded on the northeast by the Santa Lucia Mountain Range, which extends almost the entire length of the County. About 75 percent of the County population and a corresponding portion of the commercial and industrial facilities are located within the Coastal Plateau. With higher population density and closer spacing of urban areas, emissions of air pollutants per unit area are generally higher here than in other regions of the County.

The climate of the County can be generally characterized as Mediterranean, with warm, dry summers and cooler, relatively damp winters. Along the coast, mild temperatures are the rule throughout the year due to the moderating influence of the Pacific Ocean. This effect is diminished inland in proportion to distance from the ocean or by major intervening terrain features, such as the coastal mountain ranges.

Local and regional weather conditions, including wind speed and direction, atmospheric stability, air temperature, and the presence or absence of temperature inversions can all contribute to the dispersion or concentration of air pollutants. The speed and direction of local winds are controlled by the location and strength of the Pacific High pressure system, local and regional topography, and by circulation patterns resulting from temperature differences between the land and sea.

4.3.1.2 Topography

The Coastal Plateau varies in elevation from sea level to about 500 feet. It is bounded on the northeast by the Santa Lucia Mountain Range. San Luis Hill juts into the Pacific Ocean just north of Pismo Beach.

4.3.1.3 Winds

The Pacific High Pressure System is a persistent high pressure area which commonly resides over the eastern Pacific Ocean. Seasonal variations in the strength and position of this pressure

cell cause seasonal changes in the weather patterns of the area. In spring and summer months (May through September), the Pacific High is located far offshore and enhances cool daytime onshore winds from the northwest. However, the summer onshore winds die down in the evening and the wind direction reverses— resulting in weak easterly land breezes. From November through April, the Pacific High tends to migrate southward, allowing northern storms to move across the County.

In addition, the decline in onshore surface winds in the fall allows an occasional weak offshore flow. The combination of daily onshore breezes and nightly offshore flow can result in a "sloshing" effect, which allows pollutants to accumulate over the ocean and be carried onshore with the return of sea breezes.

4.3.1.4 Temperature and Precipitation

The nearest National Weather Service Cooperative Observer Program (COOP) weather station to the Project is the station in Pismo Beach, located approximately two miles southwest of the Project. At the Pismo Beach station (WRCC 2009), average recorded rainfall during the Period of Record (1949 to 2006) measured 17.14 inches, with 92 percent of precipitation occurring between November and April. Monthly average maximum temperatures at this station vary by only 9.0 degrees Fahrenheit (°F); 72.3 °F to 53.2 °F annually; and monthly average minimum temperatures vary only by 10.9 °F annually; i.e. from 42.4 °F to 53.2 °F.

4.3.2 <u>Air Quality Standards</u>

Table 4-2 shows State and federal air quality standards.

The U.S. Environmental Protection Agency (EPA) sets National Ambient Air Quality Standards (NAAQS), also known as federal standards, for six common air pollutants, called criteria air pollutants. The six federal criteria pollutants are ozone, particulate matter (both PM_{10} and $PM_{2.5}$), nitrogen dioxide, carbon monoxide, lead, and sulfur dioxide. The NAAQS were set to protect public health, including that of sensitive individuals. The California Air Resources Board (CARB) also administers California ambient air quality standards (CAAQS) for the 10 air pollutants designated in the California Clean Air Act. The 10 State air pollutants are the 6 federal criteria pollutants listed above plus visibility reducing particles, hydrogen sulfide, sulfates, and vinyl chloride.

Table 4-2: Ambient Air Quality Standards for Criteria Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard
Ozone (O_3)	1 hour	0.09 ppm	—
	8 hour	0.070 ppm	0.075 ppm
Respirable particulate matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3
	Mean	20 µg/m^3	—
Fine particulate matter ($PM_{2.5}$)	24 hour	—	35 µg/m^3
	Mean	12 µg/m^3	15.0 µg/m^3
Carbon monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm	—
	Mean	0.030 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1 hour	0.25 ppm	—
	24 hour	0.04 ppm	0.14 ppm
	Mean *	—	0.030 ppm
Lead	30-day	1.5 µg/m^3	—
	Rolling 3-month	—	0.15 µg/m^3 **
	Quarter	—	1.5 µg/m^3
Sulfates	24 hour	25 µg/m^3	---
Hydrogen sulfide	1 hour	0.03 ppm	---
Vinyl chloride**	24 hour	0.01 ppm	---
Visibility-reducing particles	8 hour	Extinction coefficient of 0.23 per kilometer, visibility of ten miles or more due to particles when relative humidity is less than 70%.	---

Abbreviations:
ppm = parts per million
µg/m^3 = micrograms per cubic meter
30-day = 30-day average
Quarter = Calendar quarter
* Mean = Annual Arithmetic Mean
* National lead standard, rolling 3-month average: final rule signed October 15, 2008.
** The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
Source: CARB 2009.

4.3.2.1 Attainment Status

EPA has identified nonattainment and attainment areas for each criteria air pollutant. Under amendments to the Federal Clean Air Act (FCAA), the EPA has classified air basins or portions thereof as "attainment," "nonattainment," or "unclassifiable," based on whether or not the national standards have been achieved. The EPA uses two categories to designate areas with respect to $PM_{2.5}$ and NO_2, which include (1) does not meet the standard (nonattainment) and (2) cannot be classified or better than national standards (unclassifiable/attainment). The EPA uses four categories to designate for sulfur dioxide, but the only two that are applicable in California are nonattainment or unclassifiable. The EPA uses three categories to designate for ozone and PM_{10}: attainment, nonattainment, and unclassifiable. The FCAA uses the classification system to design clean-up requirements appropriate for the severity of the pollution and set realistic deadlines for reaching clean-up attainment.

The State designation criteria specify four categories: nonattainment, nonattainment-transitional, attainment, and unclassified. A nonattainment designation indicates one or more violations of the State standard have occurred. A nonattainment-transitional designation is a subcategory of nonattainment that indicates improving air quality, with only occasional violations or exceedances of the State standard. In contrast, an attainment designation indicates no violations of the State standard. Finally, an unclassified designation indicates either no air quality data or an incomplete set of air quality data.

Table 4-3 shows State and federal designations for San Luis Obispo County.

4.3.2.2 Baseline Air Quality

Existing local air quality, historical trends, and projections of air quality are best evaluated by reviewing relevant air pollutant concentrations from near the Project area. The San Luis Obispo Air Pollution Control District (SLOAPCD) lists several ambient air pollutants of local concern in the County in their Annual Report (SLOAPCD 2007): ozone, particulate matter, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and carbon monoxide (CO).

The nearest air monitoring station is the San Luis Obispo station, located on South Higuera Street, approximately 7 miles north of the Project. The San Luis Obispo station currently measures ozone PM_{10}, and $PM_{2.5}$. CO was measured until 2006.

Table 4-3: Designations/Classifications for San Luis Obispo County

Pollutant	State Designation	Federal Designation
Ozone	Nonattainment (Moderate)	Unclassifiable/Attainment
Respirable PM (PM_{10})	Nonattainment	Unclassifiable
Fine PM ($PM_{2.5}$)	Attainment	Unclassifiable/Attainment
Carbon Monoxide (CO)	Attainment	Unclassifiable/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassifiable/Attainment
Sulfur Dioxide	Attainment	Unclassifiable
Sulfates	Attainment	**No Federal Standard**
Lead	Attainment	
Hydrogen Sulfide (H_2S)	Attainment	
Visibility reducing Particles	Unclassified	

Source: CARB 2006.

Table 4-4: Air Quality Monitoring

Air Pollutant/Location	2006	2007	2008
Ozone (O_3)			
Max 1 Hour (ppm)	0.070	0.071	**0.109**
Days > CAAQS (0.09 ppm)	0	0	**1**
Max 8 Hour (ppm)	0.059	0.063	**0.076**
Days > NAAQS (0.075 ppm)	0	0	**1**
Days > CAAQS (0.070 ppm)	0	0	**2**
Particulate Matter (PM_{10})			
Max Daily California Measurement	**70.0**	31.0	41.2
Days > CAAQS (50 µg/m^3)	**1**	0	0
Days > NAAQS (150 µg/m^3)	0	0	0
Particulate Matter ($PM_{2.5}$)			
Max Daily Measurement	24.2	19.2	18.4
Days > NAAQS (35 µg/m^3)	0	0	0
Carbon Monoxide (CO)			
Max 8 Hour (ppm)	0.78	–	–
Days > NAAQS (9 ppm[1])	0	–	–
Days > CAAQS (9.0 ppm)	0	–	–

Abbreviations:
> = exceed ppm = parts per million µg/m^3 = micrograms per cubic meter
CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard
Mean = Annual Arithmetic Mean
Source: CARB 2009b

Table 4-4 summarizes 2006 through 2008 published monitoring data from the CARB's Aerometric Data Analysis and Management System (ADAM) from the San Luis Obispo station. As shown in Table 4-4, ambient air pollution concentrations in the San Luis Obispo area have exceeded the State 8-hour ozone standard twice and the federal 8-hour ozone standard once in 2008. The State 1-hour ozone standard was also exceeded one time during 2008. In addition, levels of PM_{10} exceeded the State standard one day in 2006. $PM_{2.5}$ federal standard levels were not exceeded in the last three years.

4.3.2.3 Sensitive Receptors

The location of a development project is a major factor in determining whether it will result in localized air quality impacts. The potential for adverse air-quality impacts increases as the distance between the source of emission and members of the public decreases. Impacts on sensitive receptors are of particular concern. Sensitive receptors are defined as facilities that house or attract children, the elderly, people with respiratory illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. During Project activities, sensitive receptors, such as family residences, would be in proximity to the activity. A description of sensitive receptors for each site is presented below.

- **St. Andrews Lift Station:** Three residences are located within 100 feet of the St. Andrews Lift Station site. The only school within 1 mile of the site is the Shell Beach Elementary School on Shell Beach Road, 0.25 mile from the site.

- **Vista del Mar Lift Station:** Three residences are located within 100 feet of the Vista del Mar Lift Station site. The only school within 1 mile of the site is also the Shell Beach Elementary School, 0.15 mile from the site.

- **Ocean Park:** Two residences are located within 100 feet of the Ocean Park site. The only school within 1 mile of the site is also the Shell Beach Elementary School, 0.4 mile from the site.

- **Price Street - North:** The closest residences to the Price Street - North site is across Highway 1, approximately 400 feet. The Shell Beach Elementary School is approximately one mile from the site.

- **Price Street – South:** No residences are located close to the Price Street - South site; however, the Judkins Middle School, on Wadsworth, is approximately one mile from the site.

- **Cypress Street Lift Station:** Four residences are located within 100 feet of the Cypress Street Lift Station site. A preschool (Happy Time Co-op) is approximately 0.25 mile from the site, and Judkins Middle School is approximately 0.35 mile from the site.

4.3.3 Environmental Consequences

4.3.3.1 Significance Criteria

The Clean Air Act (CAA) as amended specifies in Section 176(a) that no department, agency, or instrumentality of the federal government shall engage in, support in any way, or provide financial assistance for, license or permit, or approve any activity which does not conform to an implementation plan after it has been approved or promulgated under Section 110 of this title. "Conformity" is defined in Section 176(c) of the CAA as conformity to the State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of such standards, and that the activity will not:

- cause or contribute to any new violation of a standard in any area;
- increase the frequency or severity of any existing violation of any standard in any area; or
- delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Construction at the six sites would be sequential. No two sites would be under construction at the same time. Therefore, emissions from construction at the sites are not additive. Each site is evaluated alone with respect to whether it exceeds significance criteria.

4.3.3.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

Construction of a rock revetment at the St. Andrews Lift Station site would place large stones at the base of the bluffs that would protect bluffs from wave-induced scour by effectively dissipating wave energy within voids between stones. The crest height of the revetment would be +22-feet MLLW. The armor stone size of the revetment is 5 tons. Approximately 3,500 tons of rock would be used on approximately 0.18 acre of beach.

The rock revetment activity would include the use of off-road equipment, i.e. a truck crane, two loaders, an excavator, and a concrete pump truck, for approximately three months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the rock revetment alternative at the St. Andrews Lift Station is presented in Table 4-5.

Since the activity of Alternative 1 at the St. Andrews Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions is only 0.72 ton per quarter (tpq), which is well below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed diesel particulate matter (DPM) and, as such, emissions of DPM from the activity of Alternative 1 at the St. Andrews Lift Station site are less than the threshold of

0.13 tpq. Therefore, air quality impacts from the activity of Alternative 1 at the St. Andrews Lift Station site are less than significant.

Table 4-5: Construction-related Emissions for Alternative 1 at the St. Andrews Lift Station

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030
On-road Vehicles	0.61	4.28	16.30	0.16	0.15	0.001	0.013	0.014	0.000	0.000
Fugitive Dust	----	----	----	0.43	----	----	----	----	0.020	----
TOTAL	**7.73**	**28.13**	**71.08**	**3.22**	**2.74**	**0.082**	**0.285**	**0.638**	**0.050**	**0.030**

The St. Andrews Lift Station site is situated in a populated area, and it would be problematic to find a staging area more than 1,000 feet from sensitive receptors. Upon consultation with Andrew Mutziger, Air Quality Specialist with the SLOAPCD (2010), it was agreed that moving the staging area to a location more than 1,000 feet from sensitive receptors would potentially create a greater air quality impact by increasing the amount of diesel traffic on the streets of Pismo Beach. Therefore, it was agreed that the following measures would be applied to reduce the potential impacts.

- All off-road construction equipment shall:
  - be maintained in proper tune, according to manufacturer's specification;
  - fueled with CARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road); and
  - meet CARB's Tier 2 certified engine level or cleaner and comply with State Off-Road Regulations.
- All on-road heavy-duty trucks servicing the site shall:
  - meet CARB's 2007 or cleaner certification standard for heavy-duty diesel engines and
  - comply with the State On-Road .

Construction or trucking companies with fleets that that do not have engines in their fleet that meet the engine standards identified in the above two measures (e.g., captive or NO_X exempt area fleets) may be eligible by proving alternative compliance.

Alternative 2: Vertical Sea Wall

Alternative 2 would construct a vertical wall made out of concrete at the toe of the bluffs at the St. Andrews Lift Station site. The crest height of the vertical wall would be +20-feet MLLW. Approximately 800 tons of rock would be used on approximately 0.06 acre of beach.

The vertical sea wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately four months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the Vertical Sea Wall Alternative at the St. Andrews Lift Station are presented in Table 4-6.

Table 4-6: Construction-related Emissions for Alternative 2 at the St. Andrews Lift Station

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.103	0.345	0.892	0.051	0.050
On-road Vehicles	2.00	12.39	54.07	0.51	0.47	0.001	0.018	0.012	0.000	0.000
Fugitive Dust	----	----	----	0.11	----	----	----	----	0.005	----
TOTAL	**8.77**	**35.10**	**112.71**	**3.95**	**3.76**	**0.104**	**0.364**	**0.904**	**0.056**	**0.050**

Since the activity of Alternative 2 at the St. Andrews Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.01 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the St. Andrews Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 2 at the St. Andrews Lift Station site are less than significant.

The St. Andrews Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for this site would be applied for this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

Alternative 3 also would construct a vertical wall made out of concrete at the toe of the bluffs at the St. Andrews Lift Station site. The difference between Alternative 2 and Alternative 3 is that the sculpted concrete/shotcrete wall would be constructed to match the alignment of the adjacent bluff toes more closely, and it would have a shotcrete surface colored to blend in with the natural bluffs. The crest height of the vertical wall would be +20-feet MLLW. Approximately 800 tons of rock would be used on approximately 0.06 acre of beach.

The sculpted concrete/shotcrete wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately five months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the Sculpted Concrete/Shotcrete Wall Alternative at the St. Andrews Lift Station is presented in Table 4-7.

Table 4-7: Construction-related Emissions for Alternative 3 at the St. Andrews Lift Station

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.159	0.555	1.357	0.077	0.076
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.001	0.025	0.013	0.000	0.000
Fugitive Dust	----	----	----	0.09	----	----	----	----	0.004	----
TOTAL	**10.38**	**41.78**	**125.47**	**4.65**	**4.48**	**0.160**	**0.581**	**1.370**	**0.081**	**0.076**

Since the activity of Alternative 3 at the St. Andrews Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.53 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the St. Andrews Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 3 at the St. Andrews Lift Station site are less than significant.

The St. Andrews Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for this site would be applied for this alternative.

No Action Alternative

Under the No Action alternative, the bluffs at the St. Andrews Lift Station site would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the hasty construction of sea walls and/or revetment without proper planning and technical and environmental review.

4.3.3.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

Construction of a rock revetment at the Vista del Mar Lift Station would place large stones at the base of the bluff. The crest height of the revetment would be +22-feet MLLW. Approximately 4,000 tons of rock would be used on approximately 0.17 acre of beach.

The rock revetment activity would include the use of off-road equipment, i.e. a truck crane, two loaders, an excavator, and a concrete pump truck, for approximately three months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the rock revetment alternative at the Vista del Mar Lift Station is presented in Table 4-8.

Table 4-8:
Construction-related Emissions for Alternative 1 at the Vista del Mar Lift Station

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030
On-road Vehicles	0.61	4.28	16.30	0.16	0.15	0.001	0.013	0.015	0.000	0.000
Fugitive Dust	----	----	----	0.41	----	----	----	----	0.019	----
TOTAL	**7.73**	**28.13**	**71.08**	**3.19**	**2.74**	**0.082**	**0.285**	**0.640**	**0.049**	**0.030**

Since the activity of Alternative 1 at the Vista del Mar Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 0.72 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 1 at the Vista del Mar Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 1 at the Vista del Mar Lift Station site are less than significant.

The Vista del Mar Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 2: Vertical Sea Wall

Alternative 2 would construct a vertical wall made out of concrete at the toe of the bluffs at the Vista del Mar Lift Station site. The crest height of the vertical wall would be +20-feet MLLW. Approximately 900 tons of rock would be used on approximately 0.06 acre of beach.

The vertical sea wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately four months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust was also estimated.

A summary of emissions for the vertical sea wall alternative at the Vista del Mar Lift Station is presented in Table 4-9.

Table 4-9:
Construction-related Emissions for Alternative 2 at the Vista del Mar Lift Station

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.103	0.345	0.892	0.051	0.050
On-road Vehicles	2.00	12.39	54.07	0.51	0.47	0.001	0.018	0.011	0.000	0.000
Fugitive Dust	----	----	----	0.11	----	----	----	----	0.005	----
TOTAL	**8.77**	**35.10**	**112.71**	**3.95**	**3.76**	**0.104**	**0.363**	**0.903**	**0.056**	**0.050**

Since the activity of Alternative 2 at the Vista del Mar Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.01 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the Vista del Mar Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 2 at the Vista del Mar Lift Station site are less than significant.

The Vista del Mar Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

Alternative 3 also would construct a vertical wall made out of concrete at the toe of the bluffs at the Vista del Mar Lift Station site. The difference between Alternative 2 and Alternative 3 is that

the sculpted concrete/shotcrete wall would be constructed to match the alignment of the adjacent bluff toes more closely, and it would have a shotcrete surface colored to blend in with the natural bluffs. The crest height of the vertical wall would be +20-feet MLLW. Approximately 900 tons of rock would be used on approximately 0.06 acre of beach.

The sculpted concrete/shotcrete wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately five months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the sculpted concrete/shotcrete wall alternative at the Vista del Mar Lift Station is presented in Table 4-10.

Table 4-10:
Construction-related Emissions for Alternative 3 at the Vista del Mar Lift Station

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.159	0.555	1.357	0.077	0.076
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.001	0.025	0.013	0.000	0.000
Fugitive Dust	----	----	----	0.09	----	----	----	----	0.004	----
TOTAL	**10.38**	**41.78**	**125.47**	**4.65**	**4.48**	**0.160**	**0.581**	**1.370**	**0.081**	**0.076**

Since the activity of Alternative 3 at the Vista del Mar Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.53 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the Vista del Mar Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 3 at the Vista del Mar Lift Station site are less than significant.

The Vista del Mar Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

<u>No Action Alternative</u>

Under the No Action alternative, the bluffs at the Vista del Mar site would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the hasty

construction of sea walls and/or revetment without proper planning and technical and environmental review.

4.3.3.4 Ocean Park

Alternative 1: Rock Revetment

Construction of a rock revetment at the Ocean Park site would place large stones at the base of the bluff. The crest height of the revetment would be +22-feet MLLW. Approximately 5,000 tons of rock would be used on approximately 0.20 acre of beach.

The rock revetment activity would include the use of off-road equipment, i.e. a truck crane, two loaders, an excavator, and a concrete pump truck, for approximately three months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the rock revetment alternative at the Ocean Park site is presented in Table 4-11.

Table 4-11:
Construction-related Emissions for Alternative 1 at the Ocean Park Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030
On-road Vehicles	0.61	4.28	16.30	0.16	0.15	0.001	0.014	0.018	0.000	0.000
Fugitive Dust	----	----	----	0.48	----	----	----	----	0.022	----
TOTAL	**7.73**	**28.13**	**71.08**	**3.26**	**2.74**	**0.082**	**0.286**	**0.643**	**0.052**	**0.030**

Since the activity of Alternative 1 at the Ocean Park site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 0.73 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 1 at the Ocean Park site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 1 at the Ocean Park site are less than significant.

The Ocean Park site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 2: Vertical Sea Wall

Alternative 2 would construct a vertical wall made out of concrete at the toe of the bluffs at the Ocean Park site. The crest height of the vertical wall would be +20-feet MLLW. Approximately 1,100 tons of rock would be used on approximately 0.08 acre of beach.

The vertical sea wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately four months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the vertical sea wall alternative at the Ocean Park site is presented in Table 4-12.

Table 4-12:
Construction-related Emissions for Alternative 2 at the Ocean Park Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.103	0.345	0.892	0.051	0.050
On-road Vehicles	2.00	12.39	54.07	0.51	0.47	0.001	0.019	0.014	0.000	0.000
Fugitive Dust	----	----	----	0.14	----	----	----	----	0.007	----
TOTAL	**8.77**	**35.10**	**112.71**	**3.98**	**3.76**	**0.104**	**0.364**	**0.906**	**0.057**	**0.050**

Since the activity of Alternative 2 at the Ocean Park site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.01 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the Ocean Park site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 2 at the Ocean Park site are less than significant.

The Ocean Park site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

Alternative 3 would also construct a vertical wall made out of concrete at the toe of the bluffs at the Ocean Park site. The difference between Alternative 2 and Alternative 3 is that the sculpted concrete/shotcrete wall would be constructed to match the alignment of the adjacent bluff toes

more closely, and it would have a shotcrete surface colored to blend in with the natural bluffs. The crest height of the vertical wall would be +20-feet MLLW. Approximately 1,100 tons of rock would be used on approximately 0.08 acre of beach.

The sculpted concrete/shotcrete wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately five months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the sculpted concrete/shotcrete wall alternative at the Ocean Park site is presented in Table 4-13.

Table 4-13:
Construction-related Emissions for Alternative 3 at the Ocean Park Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.159	0.555	1.357	0.077	0.076
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.001	0.026	0.016	0.000	0.000
Fugitive Dust	----	----	----	0.12	----	----	----	----	0.005	----
TOTAL	**10.38**	**41.78**	**125.47**	**4.67**	**4.48**	**0.160**	**0.581**	**1.372**	**0.083**	**0.076**

Since the activity of Alternative 3 at the Ocean Park site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.53 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 3 at the Ocean Park site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 3 at the Ocean Park site are less than significant.

The Ocean Park site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

No Action Alternative

Under the No Action alternative, the bluffs at the Ocean Park site would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the hasty construction of sea walls and/or revetment without proper planning and technical and environmental review.

4.3.3.5 Price Street – North

Alternative 1: Rock Revetment

Construction of a rock revetment at the Price Street - North site would place large stones at the base of the bluff. The crest height of the revetment would be +22-feet MLLW. Approximately 8,300 tons of rock would be used on approximately 0.39 acre of beach.

The rock revetment activity would include the use of off-road equipment, i.e. a truck crane, two loaders, an excavator, and a concrete pump truck, for approximately five months. Construction at the Price Street - North site would take longer than at the other sites because of the access difficulties and the height of the bluffs, which are over 100 feet high in the Price Street area. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the rock revetment alternative at the Price Street - North site is presented in Table 4-14.

Table 4-14:
Construction-related Emissions for Alternative 1 at the Price Street - North Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.135	0.453	1.041	0.050	0.049
On-road Vehicles	0.61	4.28	16.30	0.16	0.15	0.001	0.023	0.031	0.000	0.000
Fugitive Dust	----	----	----	0.56	----	----	----	----	0.026	----
TOTAL	**7.73**	**28.13**	**71.08**	**3.35**	**2.74**	**0.137**	**0.476**	**1.072**	**0.076**	**0.050**

Since the activity of Alternative 1 at the Price Street - North site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.21 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 1 at the Price Street - North site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 1 at the Price Street - North site are less than significant.

The Price Street - North site is situated away from populated areas, and finding a staging area more than 1,000 feet from sensitive receptors may be possible. To reduce the potential impact of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 2: Vertical Sea Wall

Alternative 2 would construct a vertical wall made out of concrete at the toe of the bluffs at the Price Street - North site. The crest height of the vertical wall would be +20-feet MLLW. Approximately 1,800 tons of rock would be used on approximately 0.22 acre of beach.

The vertical sea wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately seven months. Construction at the Price Street - North site would take longer than at the other sites because of the access difficulties at the site and the height of the bluffs, which are over 100 feet high in the Price Street area. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the vertical sea wall alternative at the Price Street - North site is presented in Table 4-15.

Table 4-15:
Construction-related Emissions for Alternative 2 at the Price Street - North Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.180	0.604	1.561	0.089	0.088
On-road Vehicles	2.00	12.39	54.07	0.51	0.47	0.002	0.034	0.030	0.001	0.001
Fugitive Dust	----	----	----	0.23	----	----	----	----	0.010	----
TOTAL	**8.77**	**35.10**	**112.71**	**4.07**	**3.76**	**0.182**	**0.638**	**1.590**	**0.099**	**0.088**

Since the activity of Alternative 2 at the Price Street - North site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.77 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the Price Street - North site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 2 at the Price Street - North are less than significant.

The Price Street - North site is situated away from populated areas, and finding a staging area more than 1,000 feet from sensitive receptors may be possible. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

Alternative 3 also would construct a vertical wall made out of concrete at the toe of the bluffs at the Price Street - North site. The difference between Alternative 2 and Alternative 3 is that the sculpted concrete/shotcrete wall would be constructed to match the alignment of the adjacent bluff toes more closely, and it would have a shotcrete surface colored to blend in with the natural bluffs. The crest height of the vertical wall would be +20-feet MLLW. Approximately 1,800 tons of rock would be used on approximately 0.22 acre of beach.

The sculpted concrete/shotcrete wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately eight months. Construction at the Price Street - North site would take longer than at the other sites because of the access difficulties and the height of the bluffs, which are over 100 feet high in the Price Street area. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the sculpted concrete/shotcrete wall alternative at the Price Street - North site is presented in Table 4-16.

Table 4-16:
Construction-related Emissions for Alternative 3 at the Price Street - North Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.255	0.888	2.171	0.123	0.122
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.002	0.043	0.032	0.001	0.001
Fugitive Dust	----	----	----	0.20	----	----	----	----	0.009	----
TOTAL	**10.38**	**41.78**	**125.47**	**4.76**	**4.48**	**0.257**	**0.932**	**2.203**	**0.133**	**0.122**

Since the activity of Alternative 3 at the Price Street - North site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are 2.46 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 3 at the Price Street - North Site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 3 at the Price Street - North Site are less than significant.

The Price Street - North site is situated away from populated areas, and finding a staging area more than 1,000 feet from sensitive receptors may be possible. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

No Action Alternative

Under the No Action alternative, the bluffs at the Price Street - North site would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the hasty construction of sea walls and/or revetment without proper planning and technical and environmental review.

4.3.3.6 Price Street – South

Alternative 1: Rock Revetment

Construction of a rock revetment at the Price Street - South site would place large stones at the base of the bluff. The crest height of the revetment would be +22-feet MLLW. Approximately 5,200 tons of rock would be used on approximately 0.16 acre of beach.

The rock revetment activity would include the use of off-road equipment, i.e. a truck crane, two loaders, an excavator, and a concrete pump truck, for approximately five months. Construction at the Price Street - South site, like the Price Street - North site, would take longer than at the other sites because of the access difficulties and the height of the bluffs, which are over 100 feet high in the Price Street area. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the rock revetment alternative at the Price Street - South site is presented in Table 4-17.

Table 4-17:
Construction-related Emissions for Alternative 1 at the Price Street - South Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.135	0.453	1.041	0.050	0.049
On-road Vehicles	0.61	4.28	16.30	0.16	0.15	0.001	0.020	0.020	0.000	0.000
Fugitive Dust	----	----	----	0.23	----	----	----	----	0.011	----
TOTAL	**7.73**	**28.13**	**71.08**	**3.01**	**2.74**	**0.136**	**0.474**	**1.061**	**0.061**	**0.050**

Since the activity of Alternative 1 at the Price Street - South site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.20 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 1 at the Price Street - South site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 1 at the Price Street - South site are less than significant.

The Price Street - South site is situated away from populated areas, and finding a staging area more than 1,000 feet from sensitive receptors may be possible. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 2: Vertical Sea Wall

Alternative 2 would construct a vertical wall made out of concrete at the toe of the bluffs at the Price Street - South site. The crest height of the vertical wall would be +20-feet MLLW. Approximately 1,100 tons of rock would be used on approximately 0.16 acre of beach.

The vertical sea wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately seven months. Construction at the Price Street - South site, like the Price Street - North site, would take longer than at the other sites because of the access difficulties and the height of the bluffs, which are over 100 feet high in the Price Street area. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the vertical sea wall alternative at the Price Street - South site is presented in Table 4-18.

Table 4-18:
Construction-related Emissions for Alternative 2 at the Price Street - South Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.180	0.604	1.561	0.089	0.088
On-road Vehicles	2.00	12.39	54.07	0.51	0.47	0.001	0.032	0.022	0.000	0.000
Fugitive Dust	----	----	----	0.17	----	----	----	----	0.008	----
TOTAL	**8.77**	**35.10**	**112.71**	**4.00**	**3.76**	**0.182**	**0.636**	**1.582**	**0.097**	**0.088**

Since the activity of Alternative 2 at the Price Street - South site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.76 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 2 at the Price Street - South site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 2 at the Price Street - South site are less than significant.

The Price Street - South site is situated away from populated areas, and finding a staging area more than 1,000 feet from sensitive receptors may be possible. To reduce the potential impacts

of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

Alternative 3 also would construct a vertical wall made out of concrete at the toe of the bluffs at the Price Street - South site. The difference between Alternative 2 and Alternative 3 is that the sculpted concrete/shotcrete wall would be constructed to match the alignment of the adjacent bluff toes more closely, and it would have a shotcrete surface colored to blend in with the natural bluffs. The crest height of the vertical wall would be +20-feet MLLW. Approximately 1,100 tons of rock would be used on approximately 0.16 acre of beach.

The sculpted concrete/shotcrete wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, a concrete pump truck, and a compressor, for approximately eight months. Construction at the Price Street - South site, like the Price Street - North site, would take longer than at the other sites because of the access difficulties and the height of the bluffs, which are over 100 feet high in the Price Street area. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the sculpted concrete/shotcrete wall alternative at the Price Street - South site is presented in Table 4-19.

Table 4-19:
Construction-related Emissions for Alternative 3 at the Price Street - South Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.255	0.888	2.171	0.123	0.122
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.002	0.042	0.024	0.001	0.001
Fugitive Dust	----	----	----	0.14	----	----	----	----	0.007	----
TOTAL	**10.38**	**41.78**	**125.47**	**4.70**	**4.48**	**0.256**	**0.930**	**2.195**	**0.130**	**0.122**

Since the activity of Alternative 3 at the Price Street - South site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 2.45 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 3 at the Price Street - South site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 3 at the Price Street - South site are less than significant.

The Price Street - South site is situated away from populated areas, and finding a staging area more than 1,000 feet from sensitive receptors may be possible. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

No Action Alternative

Under the No Action alternative, the bluffs at the Price Street - South site would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the hasty construction of sea walls and/or revetment without proper planning and technical and environmental review.

4.3.3.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

Construction of a rock revetment at the Cypress Street Lift Station site would place large stones at the base of the bluff. The crest height of the revetment would be +20-feet MLLW. Approximately 20,700 tons of rock would be used on approximately 0.87 acre of beach.

The rock revetment activity would include the use of off-road equipment, i.e. a truck crane, two loaders, an excavator, and a concrete pump truck, for approximately three months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, soil haul trucks, and employee vehicles. Emission of fugitive dust also was estimated. A summary of emissions for the rock revetment alternative at the Cypress Street Lift Station site is presented in Table 4-20.

Table 4-20:
Construction-related Emissions for Alternative 1 at the Cypress Street Lift Station Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001
Fugitive Dust	----	----	----	2.10	----	----	----	----	0.096	----
TOTAL	**8.52**	**32.67**	**92.64**	**5.08**	**2.93**	**0.085**	**0.301**	**0.715**	**0.127**	**0.030**

Since the activity of Alternative 1 at the Cypress Street Lift Station site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 0.80 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are assumed DPM and, as such, emissions of DPM from the activity of Alternative 1 at the Cypress

Street Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 1 at the Cypress Street Lift Station site are less than significant.

The Cypress Street Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce the potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

Alternative 4: Steel Sheet Pile Wall

Alternative 4 would construct a steel sheet pile wall at the Cypress Street Lift Station site. Steel sheet pile walls could not be constructed at the other sites because the other five sites have limited beach access for driving sheet pile walls and because the steel wall would be visible and is not considered visually appealing. At Cypress Street Lift Station, a steel sheet pile seawall could be driven in place close to the bluff face, where it would most likely be covered by sand. The sheet pile wall would have an armor stone toe apron and a concrete cap. The crest height of the vertical wall would be +20-feet MLLW. Approximately 4,400 tons of rock would be used on approximately 0.15 acre of beach.

The steel sheet pile wall activity would include the use of off-road equipment, i.e. a truck crane, a loader/forklift, an excavator, two welding machines, a concrete pump truck, and a compressor, for approximately four months. Additionally, the activity would produce emissions from on-road vehicles, including rock haul trucks, concrete trucks, sheet pile delivery trucks, and employee vehicles. Emission of fugitive dust also was estimated.

A summary of emissions for the steel sheet pile wall alternative at the Cypress Street Lift Station site is presented in Table 4-21.

Table 4-21:
Construction-related Emissions for Alternative 4 at the Cypress Street Lift Station Site

Source	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$
Off-road Construction Equipment	8.00	26.92	66.14	3.98	3.94	0.122	0.409	1.006	0.061	0.060
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000
Fugitive Dust	----	----	----	0.27	----	----	----	----	0.012	----
TOTAL	**9.47**	**36.07**	**105.73**	**4.63**	**4.29**	**0.123**	**0.430**	**1.043**	**0.073**	**0.060**

Since the activity of Alternative 4 at the Cypress Street Lift Station Site is greater than 90 days, significance is determined by comparing to the quarterly emissions thresholds. ROG plus NO_X emissions are only 1.17 tpq, which is below the Tier 1 levels of 2.5 tpq; and the fugitive dust is well below the PM_{10} threshold of 2.5 tpq. All PM_{10} emissions not related to fugitive dust are

assumed DPM and, as such, emissions of DPM from the activity of Alternative 4 at the Cypress Street Lift Station site are less than the threshold of 0.13 tpq. Therefore, air quality impacts from the activity of Alternative 4 at the Cypress Street Lift Station site are less than significant.

The Cypress Street Lift Station site is situated in a populated area; it would be difficult to identify a reasonably located staging area more than 1,000 feet from sensitive receptors. To reduce potential impacts of staging within 1,000 feet, emission reduction measures identified for the rock revetment alternative for the St. Andrews Lift Station site would be applied for this alternative.

No Action Alternative

Under the No Action alternative, the bluffs at the Cypress Street Lift Station site would receive no planned protection. The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access. Emergency attempts to control the erosion may result in the hasty construction of sea walls and/or revetment without proper planning and technical and environmental review.

4.3.4 Climate Change Analysis

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). GHGs are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Currently, there are no federal standards for GHG emissions, and no federal regulations have been set at this time. Currently, control of GHGs is generally regulated at the State level by setting emission reduction targets for existing sources of GHGs, setting policies to promote renewable energy and increase energy efficiency, and developing statewide action plans. The Project will generate emissions of CO_2 in the form of vehicle exhaust during construction. The following approach is used to address the threshold and assess the significance of the Project's cumulative contribution to global climate change:

1. **Inventory:** An inventory of GHG emissions generated by the Project will be presented for informational purposes. The inventory will be compared to the inventory for California and the United States and a local inventory, if available.

2. **Climate Change Impacts on Project:** The potential impacts of climate change on the proposed Project will be assessed.

4.3.4.1 GHG Emissions Inventory

Even though purchased electricity may emit a small amount of indirect GHG emissions, and construction equipment would emit minor amounts of CH_4 and N_2O, the predominant GHG emission during construction would be CO_2 from construction equipment. Currently, no federal standards exist for GHGs emissions. To date, there is little guidance and no local, regional, State, or federal regulations to establish a threshold of significance to determine the impacts of individual project GHG emissions on global warming. No science-based GHG significance thresholds have been established, nor has the Federal government or the State adopted any by regulation. The USACE has established the following position under NEPA:

> In the absence of an adopted or science-based GHG standard, the USACE will not propose a new GHG standard or make a NEPA impact determination for GHG emissions anticipated to result from any of the actions identified under the proposed project. Rather, in compliance with the NEPA implementing regulations, the anticipated GHG emissions will be disclosed without expressing a judgment as to their significance.

GHG emissions were estimated. Table 4-22 shows the estimated total CO_2 emissions from construction activity from the proposed Project.

Table 4-22: GHG Summary for Proposed Project

Site/Alternative	CO_2 Emissions in tonnes		
	Off-road	On-road	Total
St Andrews Lift Station			
Rock Revetment	342	14	356
Vertical Concrete Wall	426	18	444
Sculpted Concrete/Shotcrete Wall	615	26	641
Vista del Mar Lift Station			
Rock Revetment	342	14	356
Vertical Concrete Wall	426	18	444
Sculpted Concrete/Shotcrete Wall	615	25	640
Ocean Park			
Rock Revetment	342	15	357
Vertical Concrete Wall	426	19	445
Sculpted Concrete/Shotcrete Wall	615	26	641
Price Street - North			
Rock Revetment	745	25	770
Vertical Concrete Wall	745	35	780
Sculpted Concrete/Shotcrete Wall	984	44	1028
Price Street - South			
Rock Revetment	570	32	602
Vertical Concrete Wall	745	32	777
Sculpted Concrete/Shotcrete Wall	984	41	1025
Cypress Street Lift Station			
Rock Revetment	342	41	383
Steel Sheet Pile Wall	462	25	487
Source: CGI 2010			

4.3.4.2 Climate Change Impacts on Project

Worldwide, average temperatures are likely to increase by 3 °F to 7 °F by the end of the twenty-first century (IPCC 2007). However, a global temperature increase does not directly translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependent on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought, and similar warming effects; whereas another region may experience a relative cooling. According to the IPCC's Working Group II Report, climate change impacts to North America may include diminishing snowpack, increasing evaporation, exacerbated shoreline erosion, exacerbated inundation from sea level rising, increased risk and frequency of wildfire, increased risk of insect outbreaks, increased experiences of heat waves, and rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations (IPCC 2007).

Due to the Project's location and purpose, sea-level rise is of particular importance. In 2009, the California Climate Change Center published a draft paper on the impacts of sea-level rise on the California Coast (CCCC 2009). Over the past century, sea level has risen nearly eight inches along the California coast; and general circulation model scenarios suggest very substantial increases in sea level as a significant impact of climate change over the coming century. The CCCC study includes a detailed analysis of the current population, infrastructure, and property at risk from projected sea-level rise if no actions are taken to protect the coast. The study bases its conclusions on medium to medium-high GHG emissions scenarios, where the mean sea level along the California coast is projected to rise from 1.0 to 1.4 meters (3.2 to 4.6 feet) by the year 2100. Some areas on the coast are specifically prone to flooding and property damage, and some are highly susceptible to erosion.

The successful implementation of the proposed Project would reduce the effects of erosion in the Project area and, therefore, would be a beneficial impact with regards to climate change's effects on the Project area.

4.3.4.3 Sea Level Rise

Future sea level rise was taken into account in the design of the alternatives (Moffatt and Nichol 2010). A design life of 50 years was assumed for all alternatives, and thus a 50-year sea level rise projection was used to determine the design water level. A range of 50-year relative sea level rise projections was calculated for the Pismo Beach area. The low range of the projected sea level rise is 0.51 feet in 50 years, the intermediate rate is 1.13 feet, and the high rate is 1.75 feet. Bluffs are more vulnerable to storm-wave induced erosion during high tides because the maximum amount of wave energy that reaches a bluff is related to the depth of water at the toe of the bluff. Thus, the design water level was calculated using a 50-year recurrence extreme water level and a 50-year sea level rise.

Because sea level rise was taken into account in the design of the alternatives, the analysis of the impacts of those alternatives includes the analysis of sea level rise. However, over the 50-year time period, the sea level rise would result in a gradual loss of beach. This loss would occur with or without the construction of a rock revetment or a sea wall.

4.4 BIOLOGICAL RESOURCES

4.4.1 Environmental Setting

The proposed Project involves providing bluff protection at six critically eroding sites along the shoreline bluffs in the northern portion of the City of Pismo Beach. Habitats in the Project area include the bluffs and the adjacent intertidal and shallow subtidal shoreline. The southern portion of the Project area, which includes the Cypress Street Lift Station site, has upper beach dunes, sandy beach intertidal and shallow soft bottom subtidal habitat. From the northern end of Pismo State Beach at the other five Project sites, the marine habitat consists of rocky intertidal shore with small pocket beaches. Offshore are prominent rocks, rocky subtidal habitat, and kelp beds.

This section first describes the terrestrial habitats of the bluffs and upper beach for the general Project area. The marine habitats, fishes, marine birds, and marine mammals for the general Project area are described next, followed by a discussion of federally listed species that may occur in the Project area. Finally, the vegetation and marine resources at the individual six sites are described.

4.4.1.1 Terrestrial

Vegetation

Ten terrestrial plant communities were identified in the Project area from Memory Park at the corner of Seacliff Drive and Paddock Avenue at the northern end to the intersection of San Luis Avenue and Cypress Street at the southern end during a November 3 and 4, 2009, reconnaissance survey. These plant communities were determined in accordance with the categories set forth in Holland (1986) and Gray and Bramlet (1992). An overview of the communities present throughout the total Project area is presented below.

Central Coastal Scrub

Central Coastal Scrub consists of shrubs between three to six feet in height, which are usually quite dense. This community is found on exposed, often south-facing slopes with shallow, rocky soils (Holland 1986). The Central Coastal Scrub in the Project area was dominated by native coyote brush (*Baccharis pilularis*) with California sagebrush (*Artemisia californica*) also abundant, and lesser amounts of lance-leaved dudleya (*Dudleya lanceolata*), California buckwheat (*Eriogonum fasciculatum*), telegraph weed (*Heterotheca grandiflora*), prostrate coastal goldenbush (*Isocoma menziesii* var. *sedoides*), and giant wild rye (*Leymus condensatus*), present. Nonnative species present within this community included: onionweed (*Asphodelus fistulosus*), flax-leaved horseweed (*Conyza bonariensis*), fennel (*Foeniculum vulgare*), shortpod mustard (*Hirschfeldia incana*), sweet-alyssum (*Lobularia maritima*), boobialla (*Myoporum insulare*) and tree tobacco (*Nicotiana glauca*).

Coastal Bluff Scrub

This community consists of low prostrate plants that are often gray in color. Coastal Bluff Scrub occurs on exposed bluffs and cliffs immediately adjacent to the ocean and often receives salt spray (Gray and Bramlet 1992). Holland (1986) describes Southern Coastal Bluff Scrub as

receiving moisture-laden winds and can intergrade with Venturan Coastal Sage Scrub, or on finer-grained soils with Valley and Foothill Grassland. The dominant native plant species within this community in the Project area included seacliff buckwheat (*Eriogonum parviflorum*) and prostrate coastal goldenbush. Other less abundant native species included: western bindweed (*Calystegia macrostegia*), lance-leaved dudleya, California buckwheat, seaside woolly sunflower (*Eriophyllum staechadifolium*), and California poppy (*Eschscholzia californica*). Nonnative species included: shortpod mustard, cheeseweed (*Malva parviflora*), myoporum (*Myoporum laetum*), and fountain grass (*Pennisetum setaceum*).

Disturbed Coastal Bluff Scrub

Coastal Bluff Scrub areas characterized as Disturbed were mapped on exposed bluffs and dominated by nonnative weed species with only minimal native vegetation present. The majority of the bluffs present within the Project area were considered Disturbed. The dominant plant species included hottentot-fig (*Carpobrotus edulis*), with some areas exhibiting a monoculture of this species, while other areas were characterized by a diverse grouping of weedy ruderal species. Native species recorded on the Disturbed bluffs included: Watson's saltbush (*Atriplex watsonii*), coyote brush, western bindweed, seacliff buckwheat, California poppy, wild heliotrope (*Heliotropium curassavicum*), lance-leaved dudleya, giant wild rye, wishbone bush (*Mirabilis* sp.), and arroyo willow. Some of the more common additional nonnative species included: onionweed, Australian saltbush (*Atriplex semibaccata*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), shortpod mustard, sunman (*Lampranthus aurantiacus*), sweet-alyssum, Italian ryegrass (*Lolium multiflorum*), crystalline iceplant (*Mesembryanthemum crystallinum*), tree tobacco, fountain grass, radish (*Raphanus sativa*), and castor bean (*Ricinus communis*), among others.

Disturbed Dune Scrub

Central Dune Scrub habitat consists of scattered shrubs, subshrubs, and herbs, generally less than three feet in height and often developing considerable cover (Holland 1986). Central Dune Scrub is farther from the coast than Central Foredune habitat. The Dune Scrub habitat in the Project area was on the beach at the southern end of the Project area near the Cypress Street Lift Station site. These dunes are considered Disturbed due to the frequency of foot traffic and because they are comprised of a minimum of 25 percent of the total cover of nonnative sea rocket (*Cakile maritima*). The native species present within this habitat included beach-bur (*Ambrosia chamissonis*) and California sea-blite (*Suaeda californica*).

Arroyo Willow Scrub

Arroyo Willow Scrub is dominated by arroyo willow trees (*Salix lasiolepis*) and saplings of riparian forest (Gray and Bramlet 1992). This community typically requires a permanent supply of fresh water, which, in the Project area, appears to be supplied by subterranean water flow seeping out of the rocks. This community in the Project area was characterized by 85 percent vegetative cover dominated by arroyo willow trees. An understory of herbaceous species was lacking due to the thick canopy overhead. Few prostrate coastal goldenbush shrubs were present along the edges of the willow canopy as the habitat transitioned into Coastal Bluff Scrub, as well

as scattered annual beard grass (*Polypogon monspeliensis*) where the habitat transitioned into Freshwater Seep habitat.

Freshwater Seep

A Freshwater Seep is described in Holland (1986) as consisting of mostly perennial herbs, especially sedges and grasses, usually forming complete cover, often low-growing but sometimes taller, growing throughout the year in areas with mild winters. The Freshwater Seeps in the Project area were inundated by subterranean water flow seeping through the rocks. Native species present included: spearscale (*Atriplex triangularis*), saltgrass (*Distichlis spicata*), Pacific silverweed (*Potentilla anserina* var. *pacifica*), and bulrush (*Scirpus* sp.).

Ornamental Landscaping

Ornamental Landscaping includes areas where the vegetation is dominated by nonnative horticultural plants (Gray and Bramlet 1992). Typically, the species composition consists of introduced trees, shrubs, and garden flowers. Ornamental Landscaping species within the Project area included: acacia (*Acacia* sp.), variegated agave (*Agave* sp.), onionweed, bougainvillea (*Bougainvillea spectabilis*), sea-fig (*Carpobrotus chilensis*), pampas grass (*Cortaderia selloana*), jade plant (*Crassula argentea*), fennel, English ivy (*Hedera helix*), toyon (*Heteromeles arbutifolia*), sunman, boobialla, myoporum, Bermuda buttercup (*Oxalis pes-caprae*), Victorian box (*Pittosporum undulatum*), and cape honeysuckle (*Tecomaria capensis*).

Turf Grass

Turf Grass is a type of Ornamental Landscaping in which nonnative grass species are regularly maintained. The turf grass patches within the Project area were typically within park areas, dominated by Bermuda grass and other lawn species.

Monterey Cypress

Within its native range on the Monterey Peninsula, the Monterey cypress (*Cupressus macrocarpa*) is a CNPS List 1B.2 species. Monterey cypress is considered sensitive in only two native occurrences on the Monterey Peninsula where it is known to grow naturally. Otherwise, this species is considered common as it has been widely planted for landscaping and has naturalized elsewhere. This evergreen tree grows naturally in closed-cone coniferous forests along the coast at elevations typically between 30 and 100 feet above mean sea level (amsl). This species was observed planted as an ornamental species adjacent to houses or other buildings throughout the Project area and within the buffer of the Cypress Street Lift Station and the Vista del Mar Lift Station sites. Although native to California, the Project site is outside of the native range for this species. Therefore, for the purposes of the Project, this species is not considered sensitive.

Monterey Pine

Within its native range, the Monterey pine (*Pinus radiata*) is a CNPS List 1B.1 species. This evergreen tree grows in closed-cone coniferous forests and cismontane woodland at elevations between 80 and 600 feet amsl. Monterey pine is known from only three native stands in

California: at Año Nuevo, Cambria, and the Monterey Peninsula. However, this species is in cultivation and is broadly used as a landscaping tree. Only one-half of the species' historical extent remains undeveloped on the Monterey Peninsula. Monterey pine is threatened by development, genetic contamination, pine pitch canker disease, and forest fragmentation, especially at Del Monte Forest and in San Luis Obispo County. Monterey pine was observed throughout the Project area planted as an ornamental tree and within the buffer of the Price Street - South site. The Project site is outside of the native range for this species. Therefore, for the purposes of this Project, this species is not considered sensitive.

Wildlife

As described above, terrestrial habitat in the Project area consists primarily of a narrow strip of sparsely vegetated bluffs between the shoreline and developed areas. Therefore, use of the Project area by terrestrial wildlife is expected to be limited. The willow scrub habitat, particularly at the Price Street - North site, contains the densest native vegetation to support birds and wildlife. It is likely that substantial numbers of birds visit these areas during migration. Birds seen in the willow habitat during the November 3 and 4, 2009, reconnaissance survey included black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Dendroica coronata*), white-crowned sparrows (*Zontrichia leucophrys*), ruby-crowned kinglet (*Regulus calendula*), and house finch (*Carpodacanus mexicanus*). American crows (*Corvus brachyrhynchos*) and rock doves (*Columba livia*) were common throughout the Project area. Peregrine falcons (*Falco peregrinus*) use the bluffs near the Price Street - South site, and osprey (*Pandion haliaetus*) also are sometimes seen there during migration (Schram 1998).

Because of the lack of continuity with other natural habitats, the bluffs in the Project area would not be expected to be a major movement corridor for terrestrial mammals. California ground squirrels (*Spermophilus becheyi*) and pocket gophers (*Thomomys bottae*) were observed during the reconnaissance survey. Other urban-adapted mammals such as raccoons (*Procyon lotor*) and opossums (*Didelphis virginiana*) likely occur in the Project area.

4.4.1.2 Marine

Habitats

The marine habitats at the southern end of the Project area seaward of the Cypress Street Lift Station site consist of intertidal sandy beach and subtidal soft bottom. Central California open coast sand beaches are very harsh environments because of high abrasion levels and the lack of firm substrate for attachment (Oakden 1999). Sandy beach biological communities exhibit low species diversity with large numbers of individuals of each species, which is characteristic of faunal assemblages in harsh environments. Most of the species characteristic of this sand beach environment are highly mobile and live buried in the sand much of the time. Central California beaches show marked patterns of zonation related to the amount of tidal inundation. The characteristic animals of the high intertidal zone are talitrid amphipod crustaceans, commonly known as beach hoppers. Beach wrack in this zone also supports insects, such as beetles and flies. The dominant species of the mid-intertidal zone is the cirolanid isopod, *Excirolana*. The swash zone, where wave breaking and runup often occur, is subjected to a high degree of water movement. The dominant species in the swash zone is the sand crab, *Emerita analoga*. The low

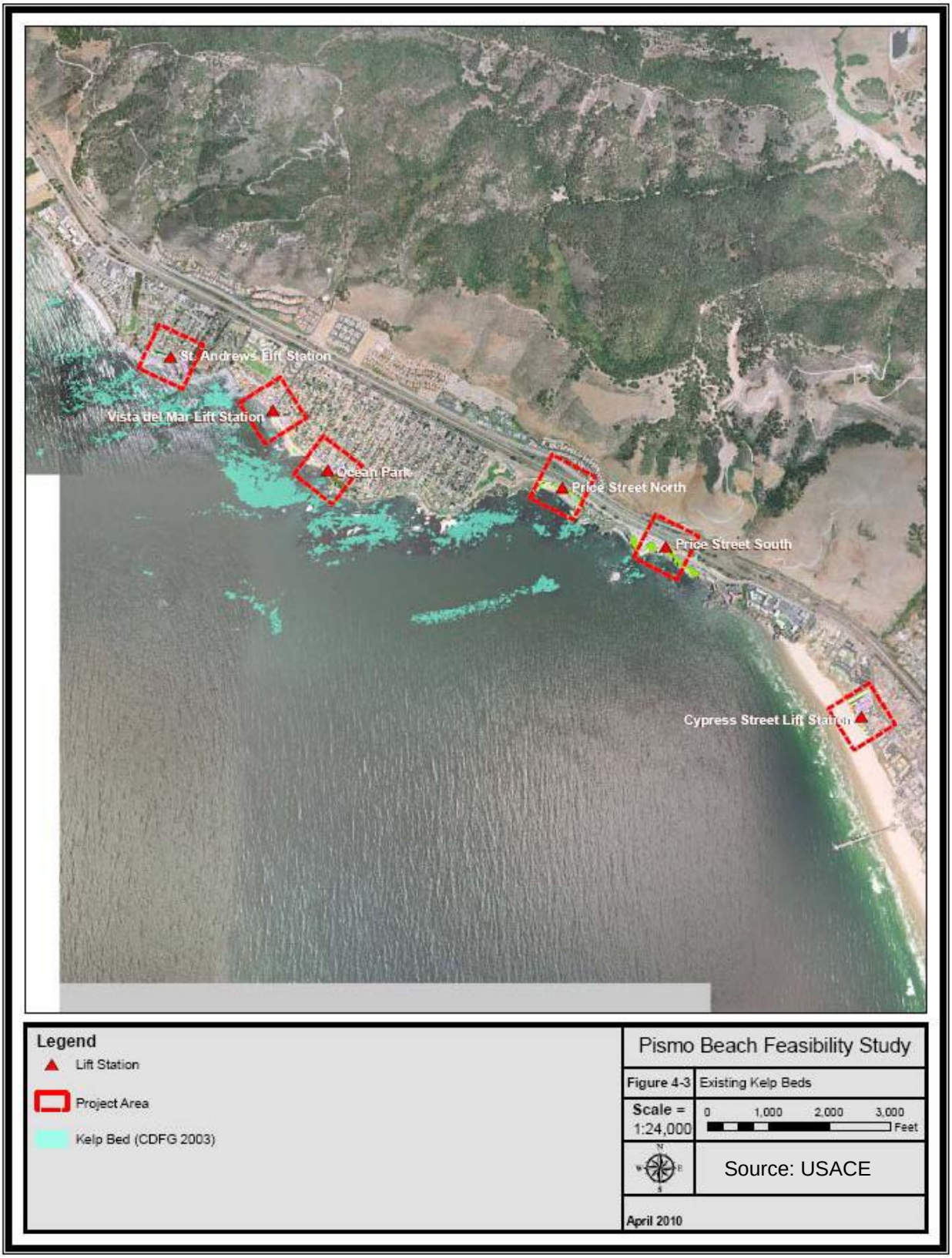
intertidal zone is exposed to the air only on the lowest tides. The low intertidal supports the most diverse species assemblage of sandy intertidal beaches. Characteristic low intertidal species include Pismo clams (*Tivella stultorum*), the mole crab *Blepharipoda occidentalis*, the bean clam *Donax gouldi*, moon snails (*Polinices lewisi*), and the polychaete worm *Euzonus* spp. (Oakden 1999). The shallow subtidal soft bottom habitats at depths up to about 30 feet in central California are characterized by highly mobile crustaceans, including sand-burrowing amphipods, cumaceans, and ostracods (Oliver and Kvitek 1999).

In the past, Pismo clams were collected intensively by clammers in the Pismo Beach area. Under the protection of the California State Parks Department, Pismo clams have recovered somewhat from this fishing pressure (City of Pismo Beach 1993). However, because Pismo clams are preyed upon by sea otters, it is unlikely that large clam beds will become re-established. Pismo clam surveys in the Pismo Beach area from 1992 through 2000 indicated low levels of recruitment (Pattison 2001).

The intertidal marine habitats in the Project area north of Pismo State Beach consist primarily of rocky intertidal with a few small pocket beaches. Rocky intertidal and subtidal habitats support a very high diversity of marine life (De Vogelaere 1999). In general, rocky intertidal habitats are characterized by four distinct zones of organisms related to the amount of tidal exposure. The splash zone is almost always exposed to air and has relatively few species. Characteristic organisms of the splash zone are periwinkles (*Littorina* spp.) and microscopic algae (De Vogelaere 1999). The high intertidal zone is exposed to air for long periods twice a day. The acorn barnacle *Balanus glandula* and the red algae *Endocladia muricata* and *Mastocarpus papillatus* are indicator species for this zone. The mid-intertidal zone is exposed to air briefly once or twice per day and supports a community characterized by the mussel *Mytilus californianus*, the goose neck barnacle *Pollicipes polymerus* and the starfish *Pisaster ochraceus*. The low intertidal is exposed to air only during the lowest tides and supports the most diverse species assemblage. Sponges and tunicates are common in this zone. Offshore, the habitat is rocky subtidal with many offshore rocks that emerge above the surface. Some of these rocks provide roosting and nesting spots for seabirds and haul-out sites for harbor seals.

Giant kelp (*Macrocystis pyrifera*) beds occur throughout the northern portion of the Project area (Figure 4-3). Surfgrass (*Phyllospadix torreyi* and *P. scouleri*) also is common in the low intertidal and shallow subtidal throughout the northern portion of the Project area. Surfgrass and giant kelp are considered to be particularly valuable marine habitats by the resource agencies because they provide shelter for fishes and invertebrates, attachment sites for sessile invertebrates, and also (both as living material and detritus) form the basis of many marine food chains. Surfgrass and giant kelp beds occur in limited areas along the California coast (usually on hard bottom substrate) compared to much more common soft bottom habitat.

Figure 4-3:
Kelp Beds



The shallow, rocky subtidal supports a more diverse assemblage of plants and animals than the rocky intertidal. Surfgrass extends into the shallow subtidal area, generally inshore of the giant kelp beds. Other characteristic inshore species include the feather boa kelp (*Egregia menzisii*), the intertidal giant kelp (*Macrocystis integrifolia*), and the bladder chain kelp (*Cystoseira osmundacea*). Several kelp species, such as the palm-like kelps *Pterygophora californica* and *Eisenia arborea*, occur as an understory layer beneath the giant kelp. The rocks and kelp provide attachment sites for turf algae and sessile invertebrates. Holes and crevices in the rocks provide shelter for crabs and other mobile invertebrates and fishes, as well as kelp stipes and holdfasts.

Fishes and Essential Fish Habitat

As discussed, subtidal habitat at the southern end of the Project area is soft bottom. In the northern portions of the Project area, the subtidal habitat is rocky with kelp beds.

Typical shallow sand bottom fishes offshore Pismo Beach include white croakers (*Genyonemus lineatus*), California halibut (*Paralichthys californicus*), pacific sanddab (*Citharichthys sordidus*), starry flounder (*Platichthys stellatus*), barred surfperch (*Amphisticus argenteus*), silver surfperch (*Hyperprosopon ellipticum*), and walleye surfperch (*H. rgenteum*) (Blunt 1980).

The California grunion *(Leuresthes tenuis*) is a nearshore fish that lays its eggs on sandy beaches in the high intertidal zone between March and August. During the grunion spawning season, eggs and developing embryos are buried in the sand to incubate between the highest tides of each month at the full and new moon (Martin 2006). Grunion are rare north of Point Conception but have a slight potential to spawn on the beach at the southern end of the Project area.

Kelp beds and shallow, rocky subtidal habitat area support a high diversity of fishes. Fishes typical of kelp beds offshore Pismo Beach include cabezon (*Scorpaenichthys marmoratus*), jacksmelt (*Atherinopsis californiensis*), kelp greenling (*Hexagrammos decagrammus*), lingcod (*Ophiodon elongotus*), painted greenling (*Oxylebius pictus*), black surfperch (*Embiotica jacksoni*), pile surfperch (*Damalichthys vacca*), rubberlip surfperch (*Rhacochiles toxotes*), striped surfperch (*Embiotica lateralis*), and several species of rockfishes (*Sebastes* spp.) (Blunt 1980).

In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, an assessment of Essential Fish Habitat (EFH) will be conducted for the proposed Project. The Project is located within an area designated as EFH for three Fishery Management Plans (FMPs): Coastal Pelagic Species Fishery Management Plan, Pacific Salmon Fishery Management Plan, and Pacific Coast Groundfish Fishery Management Plan.

Table 4-23 lists species managed under these plans. Many of the 89 species managed under these plans would be expected to occur offshore the Project area.

Table 4-23:Species Managed Under Fisheries Management Plans

COMMON NAME	SCIENTIFIC NAME	COMMON NAME	SCIENTIFIC NAME
COASTAL PELAGICS FISHERY MANAGEMENT PLAN			
Northern anchovy	*Engraulis mordax*	Pacific sardine	*Sardinops sagax*
Pacific (chub) mackerel	*Scomber japonicus*	Jack mackerel	*Trachurus symmetricus*
Market squid	*Loligo opalescens*		
PACIFIC SALMON FISHERY MANAGEMENT PLAN			
Chinook salmon	*Oncorhynchus ishawyischa*	Coho salmon	*Oncorhynchus kisutch*
Pink salmon	*Oncorhynchus orbuscha*		
PACIFIC GROUNDFISH FISHERY MANAGEMENT PLAN			
Arrowtooth flounder	*Atheresthes stomlas*	Butter sole	*Isopsetta isolepsis*
Curlfin sole	*Pleuronechthys decurrens*	Dover sole	*Microstomus pacificus*
English sole	*Parophrys vetulus*	Flathead sole	*Hippoglossoides elassodon*
Pacific sanddab	*Citharichthys sordidus*	Petrale sole	*Eopsetta jordani*
Rex sole	*Glyptocephalus zachirus*	Rock sole	*Lepidopsetta bilineata*
Sand sole	*Psettichthys melanostictus*	Starry flounder	*Plaitichthys stellatus*
Aurora rockfish	*Sebastes aurora*	Bank rockfish	*Sebastes rufus*
Black rockfish	*Sebastes melanops*	Black and yellow rockfish	*Sebastes chrysomelas*
Blackgill rockfish	*Sebastes melanostomus*	Blue rockfish	*Sebastes mystinus*
Bocaccio	*Sebastes paucispinis*	Bronzespotted rockfish	*Sebastes gilli*
Brown rockfish	*Sebastes auriculatus*	Calico rockfish	*Sebastes dallii*
California scorpionfish	*Scorpaena gutatta*	Canary rockfish	*Sebastes pinniger*
Chameleon rockfish	*Sebastes phillipsi*	Chilipepper	*Sebastes goodei*
China rockfish	*Sebastes nebulosus*	Copper rockfish	*Sebastes caurinus*
Cowcod rockfish	*Sebastes levis*	Darkblotched rockfish	*Sebastes crameri*
Dusky rockfish	*Sebastes ciliatus*	Dwarf-Red rockfish	*Sebastes rufinanus*
Flag rockfish	*Sebastes rubrivinctus*	Freckled rockfish	*Sebastes lentignosus*
Gopher rockfish	*Sebastes carnatus*	Grass rockfish	*Sebastes rastrelliger*
Greenblotched rockfish	*Sebastes rosenblatti*	Greenspotted rockfish	*Sebastes chlorostictus*
Greenstriped rockfish	*Sebastes elongatus*	Halfbanded rockfish	*Sebastes semicinctus*
Harlequin rockfish	*Sebastes variegates*	Honeycomb rockfish	*Sebastes umbrosus*
Kelp rockfish	*Sebastes atrovirens*	Longspine thornyhead	*Sebastolobus altivelis*
Mexican rockfish	*Sebastes macdonaldi*	Olive rockfish	*Sebastes serranoides*
Pacific ocean perch	*Sebastes alutus*	Pink rockfish	*Sebastes eos*
Pinkrose rockfish	*Sebastes simulator*	Puget Sound rockfish	*Sebastes emphaeus*
Pygmy rockfish	*Sebastes wilsoni*	Quillback rockfish	*Sebastes maliger*
Redbanded rockfish	*Sebastes babcocki*	Redstripe rockfish	*Sebastes proriger*
Rosethorn rockfish	*Sebastes helvomaculatus*	Rosy rockfish	*Sebastes rosaceus*
Rougheye rockfish	*Sebastes aleutianus*	Semaphore rockfish	*Sebastes melanosema*
Sharpchin rockfish	*Sebastes zacentrus*	Shortbelly rockfish	*Sebastes jordani*
Shortraker rockfish	*Sebastes borealis*	Shortspine thornyhead	*Sebastolobus alascanus*
Silvergrey rockfish	*Sebastes brevispinis*	Speckled rockfish	*Sebastes ovalis*
Splitnose rockfish	*Sebastes diploproa*	Squarespot rockfish	*Sebastes hopkinsi*
Starry rockfish	*Sebastes constellatus*	Stripetail rockfish	*Sebastes saxicola*
Swordspine rockfish	*Sebastes ensifer*	Tiger rockfish	*Sebastes nigrocinctus*
Treefish	*Sebastes serriceps*	Vermilion rockfish	*Sebastes miniatus*
Widow rockfish	*Sebastes entomelas*	Yelloweye rockfish	*Sebastes ruberrimus*
Yellowmouth rockfish	*Sebastes reedi*	Yellowtail rockfish	*Sebastes flavidus*
Cabezon	*Scorpaenichthys marmoratus*	Kelp greenling	*Hexagrammos decagrammus*
Lingcod	*Ophiodon elongatus*	Pacific cod	*Gadus macrocephalus*
Pacific whiting	*Merluccius productus*	Sablefish	*Anoplopoma fimbria*
Big skate	*Raja binoculata*	California skate	*Raja inornata*
Leopard shark	*Triakis semifasciata*	Longnose skate	*Raja rhina*
Soupfin shark	*Galeorhinus zyopterus*	Spiny dogfish	*Squalus acanthias*
Finescale codling	*Antimora microlepis*	Pacific rattail	*Coryphaenoides acrolepis*
Ratfish	*Hydrolagus colliei*		

Marine Mammals

At least 28 species of marine mammals occur along the central California coast (Harvey 1999). The species that would be most likely to occur in shallow waters offshore Pismo Beach include harbor seal (*Phoca vitulina*), southern sea otter (*Enhydra lutris nereis*), bottlenose dolphin (*Tursiops truncates*), and California sea lion (*Zalophus californianus*). Harbor seals haul out on the rocks throughout the Project area and also may use the pocket beaches. Sea otters are common in the kelp beds in the northern portion of the Project area. Sea otters, harbor seals, and bottlenose dolphins were observed in the Project area during the November 3 and 4, 2009, reconnaissance survey.

Marine Birds

The Project area supports a variety of seabirds and shorebirds. Large numbers of California brown pelicans (*Pelecanus occidentalis*), Brandt's cormorants (*Phalacrocorax pencillatus*), pelagic cormorants (*P. pelagicus*), double-crested cormorants (*P. auritus*), western gulls (*L. occidentalis)*, and Heermann's gulls (*L. heermanni*) roost on the bluffs and offshore rocks of the northern portion of the Project area. In the spring and summer, pigeon guillemots also are common on the cliffs and rocks (Schram 1998). Rhinoceros auklets (*Cerorhinca monocerata*) also have been seen near the Price Street - South site. Seabirds that nest in the Project area include western gulls, pigeon guillemots, pelagic cormorants, and a shorebird, black oystercatchers (*Haematopus bachmani*) (Carter et al., 1992). Offshore, in addition to the pelicans, cormorants, gulls, and pigeon guillemots, characteristic species include sooty shearwaters (*Puffinus griseus*), western grebes (*Aechmophorus occidentalis*), and surf scoters (*Melnitta perspicillata*) (Schram 1998).

Shorebirds typical of the sandy beach habitat at the south end of the Project area include sanderlings (*Calidris alba*), willets (*Catoptrophorus semipalmatus*), whimbrels (*Numenius pheopus*), and marbled godwits (*Limosa fedoa*). The rocky intertidal in the northern portion of the Project area is used by these species as well as by black oystercatchers, black and ruddy turnstones (*Arenaria melanocephala* and *A. interpres*), wandering tattlers (*Heteroscelus incanus*), surfbirds (*Aphriza virgata*), spotted sandpipers (*Actitis maculria*), and snowy egrets (*Egretta thula*).

4.4.1.3 Federal Listed Species

Vegetation

Seven threatened or endangered species have been identified as having a potential to occur in the vicinity of the Pismo Beach Shoreline Protection Study (USFWS 2009). These species include:

Morro manzanita (*Arctostaphylos morroensis*), marsh sandwort (*Arenaria paludicola*), Chorro Creek bog thistle (*Cirsium fontinale* var. *obispoense*), La Graciosa thistle (*Cirsium loncholepis*), Pismo clarkia (*Clarkia speciosa* ssp. *immaculata*), Indian Knob mountainbalm (*Eriodictyon altissimum*), and Gambel's water cress (*Rorippa gambellii*). Indian Knob mountainbalm and the La Graciosa thistle have a low potential to occur within the Project area. Minimal habitat was present within the Project area for Morro manzanita; however, this species was not observed

during the survey when it would have been conspicuous and is therefore considered absent from the site. The remaining four plant species are considered absent from the Project site due to a lack of suitable habitat present. A description of each of the threatened or endangered plant species with a potential to occur follows below.

Morro Manzanita (*Arctostaphylos morroensis*) – Federal Threatened – Morro manzanita is a federal-listed as threatened, CNPS List 1B.1 species. This evergreen shrub flowers from December to March. It is generally found within chaparral, cismontane woodlands, coastal dunes, and coastal scrub habitats in sandy loam soils at elevations between 15 to 675 feet above mean sea level. The range of this species includes San Luis Obispo County. Morro manzanita is threatened by urbanization and alteration of fire regimes. This species also is possibly threatened by encroachment of nonnative plants. No manzanita species were observed within the Project site when it would have been conspicuous; therefore, the Morro manzanita is considered absent from the Project site.

La Graciosa Thistle (*Cirsium loncholepis*) – Federal Endangered, State Threatened – La Graciosa thistle is a federal-listed endangered and state-listed as threatened, CNPS List 1B.1 species. This perennial herb flowers from May to August. It is generally found within cismontane woodland, coastal dunes, coastal scrub, marsh and swamp, and valley and foothill grassland habitats in mesic sandy soils at elevations between 13 to 721 feet amsl. This species can also be found on lake edges, riverbanks, and other wetlands. This range of this species includes Monterey, Santa Barbara, San Luis Obispo, and Ventura Counties. La Graciosa thistle is threatened by development, vehicles, groundwater pumping, and nonnative plants; and it is possibly threatened by grazing. This species has a low potential to be found in Central Coastal Scrub areas within the Project site because even though the appropriate scrub habitat and elevations occur, undisturbed Central Coastal Scrub in the Project area is confined to relatively small patches. This species was not observed during the November 2009 survey; however, the Coastal Central Scrub habitat at the Price Street - South site could not be closely surveyed because of a lack of beach access.

Marsh Sandwort (*Arenaria paludicola*) – Federal and State Endangered – Marsh sandwort is a federal-and state-listed as endangered, CNPS List 1B.1 species. This perennial herb flowers from May to August in freshwater swampy areas and boggy meadows at elevations upwards to approximately 600 feet amsl. The range of this species includes San Bernardino, Los Angeles, and Santa Barbara counties, to Washington. Marsh sandwort is threatened by development, erosion, and competition with nonnative plants. Due to a lack of suitable habitat within the Project site, this species is considered absent.

Pismo Clarkia (*Clarkia speciosa* ssp. *immaculata*) – Federal Endangered, State Rare – Pismo clarkia is a federal-listed as endangered, state-listed as rare, CNPS List 1B.1 species. It is an annual herb that blooms between May and June. It is generally found within chaparral, cismontane woodland, and grassland communities located on ancient sand dunes not far from the coast in San Luis Obispo County. Threats to this species include development, road maintenance, and possibly grazing. Due to a lack of suitable habitat within the Project site, this species is considered absent.

Chorro Creek Bog Thistle (*Cirsium fontinale* var. *obispoense*) – Federal and State Endangered – Chorro Creek bog thistle is a federal- and state-listed as endangered, CNPS List 1B.2 species. This perennial herb typically flowers from February to July. It is generally found within chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats in serpentine seeps and drainages at elevations between 115 to 1,250 feet amsl. The range of this species includes San Luis Obispo County. Chorro Creek bog thistle is threatened by grazing, development, and proposed water diversions. Due to the lack of suitable habitat onsite and the absence of serpentine soils, this species is considered absent from the Project site.

Gambel's Water Cress (*Rorippa* or *Nasturtium gambellii*) – Federal and State Endangered – Gambel's water cress is a federal- and state-listed as endangered, CNPS List 1B.1 species. This perennial rhizomatous herb flowers between April and September and is found along lakes and streambeds, in brackish or freshwater, and/or just above water level. Habitat includes marshes and swamps at elevations up to 1,100 feet amsl. The known range of this species exists in Los Angeles, Orange, Santa Barbara, San Bernardino, San Diego, and San Luis Obispo counties and Baja California, Mexico. This species is threatened by habitat loss and erosion. Due to a lack of suitable habitat within the Project site, this species is considered absent.

Indian Knob Mountainbalm (*Eriodictyon altissimum*) – Federal and State Endangered – Indian Knob mountainbalm is a federal- and state-listed as endangered, CNPS List 1B.1 species. This evergreen shrub typically flowers from March to June. It is generally found within chaparral, cismontane woodland, and coastal scrub habitats on Pismo sandstone soils at elevations between 260 to 885 feet amsl. This range of this species includes San Luis Obispo County. Indian Knob mountainbalm is threatened by urbanization, energy development, and vehicles, and possibly by alteration of fire regimes and nonnative plants. Appropriate habitat for this species occurs in the Project area, but the elevation onsite is lower than the elevation range of the species. Therefore, a low potential exists for this species to be found in Central Coastal Scrub habitats within the Project site.

Wildlife

Eight federally-listed wildlife species have been identified by the United States Fish and Wildlife Service as having the potential to occur in the Project area (USFWS 2009). Of these species, California red-legged frog (*Rana aurora draytonii*) and tidewater goby (*Eucyclogobius newberryi*) can be considered absent from the site because of a lack of habitat. The remaining six species have the potential to occur in the Project area. In addition, black abalone (*Haliotis cracherodii*) has recently been listed as federally endangered and has the potential to occur in the Project area.

Black Abalone (*Haliotis cracherodii*) – Federal Endangered – Black abalone are marine gastropods that occur in intertidal and shallow subtidal rocky habitat from northern California to Bahia Tortugas, Mexico. Black abalones inhabit rocky shores where bedrock provides deep, protective crevice structure (Schwaab 2010). Black abalone populations have declined dramatically since the 1970s from overfishing and a bacterial disease known as withering syndrome. Most of the central California coastline, including Pismo Beach, was recently proposed as Critical Habitat for black abalone (Schwaab 2010). The scoured cobble/boulder hard substrate of the pocket beaches at the Project sites is not suitable habitat for black abalones, and

none were seen during the November 2009 reconnaissance survey; however, the more extensive intertidal benches and tidepools adjacent to the Project sites could support black abalone.

South-Central California Coast Steelhead (*Oncorhynchus mykiss irideus*) – Federal Threatened – Steelhead are the ocean-going form of rainbow trout. They spawn in coastal streams but spend their adult lives in the ocean. The South-central California Coast Steelhead Evolutionarily Significant Unit (ESU) extends from the Pajaro River south to the Santa Maria River and includes those portions of coastal watersheds that are at least seasonally accessible to steelhead entering from the ocean. No streams occur within the Project area. However, Pismo Creek, approximately one-half mile south of the southern end of the Project area is designated Critical Habitat for the south-central California Coast steelhead (NMFS 2005). Steelhead have been collected in Pismo Creek in recent years (CDFG 2009). Steelhead, therefore, may be present in nearshore waters within the Project area.

Tidewater Goby (*Eucyclogobius newberryi)* – Federal Endangered – The tidewater goby occurs in brackish (i.e., salinity usually less than 10 parts per thousand) to freshwater habitats along the California coast from the mouth of the Smith River in Del Norte County to Aqua Hedionda Lagoon in San Diego County. This small fish is found in shallow lagoons and lower stream reaches where slow-moving or still, but not stagnant, water is found with high oxygen levels. No streams or lagoons and, therefore, no tidewater goby habitat, are found within the Project area. However, tidewater gobies do occur in Pismo Creek about one-half mile south of the Project area (CDFG 2009).

California Red-legged Frog (*Rana aurora draytonii*) – Federal Threatened – The California red-legged frog, one of two subspecies of red-legged frog, is the largest native frog in the western United States. It is endemic to California and Baja California, Mexico, at elevations ranging from sea level to about 5,000 feet. The California red-legged frog occurs in lowlands and foothills in or near permanent sources of deep water with dense shrubby or emergent riparian vegetation. Red-legged frogs have been found in several drainages inland of Highway 1 in Pismo Beach (CDFG 2009). The bluff and intertidal habitat of the Project area is not suitable for red-legged frogs.

Western Snowy Plover (*Charadrius alexandrinus nivosus*) – Federal Threatened – The coastal population of nesting western snowy plover was listed as federally threatened in 1993. This species formerly nested on open sandy beaches throughout coastal California from Humboldt County southward to San Diego County. The northern populations migrate south to central and southern California during the winter (Grinnell and Miller 1944). Critical habitat for snowy plovers was designated in 2005 (USFWS 2005). The Project area is not listed as critical habitat for snowy plovers and snowy plovers do not nest within the Project area. Oceano Dunes State Vehicle Recreation Area, approximately three miles south of the southern end of the Project area, supports snowy plover nesting (USFWS 2008). Snowy plovers may at times forage on the beach at the southern end of the Project area or in the rocky intertidal or pocket beaches near the northern sites.

Marbled Murrelet (*Brachyramphus marmoratus marmoratus*) – Federal Threatened and State Endangered – Marbled murrelets are relatively rare late summer, fall, and winter visitors to nearshore waters of San Luis Obispo and Santa Barbara Counties (Lehman 1994). The Project

area is near the southern end of its regular range (Zeiner et al., 1990). Marbled murrelets breed in old-growth coniferous forests from Monterey County north. This species may occasionally be present in nearshore waters offshore the Project area.

California Least Tern (*Sterna antillarum browni*) – Federal and State Endangered – The California least tern is listed as endangered by both the Federal government and the State of California. The California least tern ranges from the San Francisco Bay area southward into South America. Least terns are present in California between mid-April and mid-September. Least terns forage close to their breeding colonies in bays, harbors, and nearshore ocean waters. Least terns forage in the ocean from just beyond the surf line to up to one to two miles out to sea (Collins et al., 1979). The majority of least tern foraging in the ocean is within one mile of shore in water less than 60 ft deep (Atwood and Minsky 1983). Least terns do not nest within the Project area. The nearest least tern nesting site is at the Oceano Dunes State Vehicular Recreational Area, about three miles south of the southern end of the Project area. In 2008, the Oceano Dunes site had 55 breeding pairs and produced 70 fledglings (Marschalek 2009). Least terns may at times forage in the waters offshore the Project area.

Southern Sea Otter (*Enhydra lutris nereis*) – Federal Threatened – The southern sea otter is a subspecies that ranges from Año Nuevo Island to Point Conception. Currently, the population size off the coast of California is approximately 2,654 animals and is experiencing a slight decline from past years (USGS 2009). The total otters counted between Hazard Canyon and Pt. Sal in 2009 was 433, or a little over 16 percent of the population. Sea otters may commonly be seen along the central California coast, and individuals may utilize nearshore kelp beds as rafting and feeding areas. Sea otters are common in the kelp beds off the northern portion of the Project area.

4.4.1.4 Biological Resources at Individual Project Sites

St. Andrews Lift Station (Figure 4-4) - The station is located on a small patch of soil adjacent to Ornamental Landscaping vegetation. The area with the pipe is dominated by sparse cover of native prostrate coastal goldenbush and nonnative Bermuda grass. The pipe protrudes from the bluffs below and slightly west of the lift station. One native arroyo willow tree grows at this site. The station is adjacent to Memory Park, vegetated with nonnative Bermuda grass. Additional species growing within the buffer area for this site include native species, such as: western bindweed, and nonnative species such as: variegated agave (*Agave* sp.), Australian saltbush, brome (*Bromus* sp.), pampas grass, red-stemmed filaree (*Erodium cicutarium*), white cudweed (*Gnaphalium luteo-album*), sunman, rosemary, and common sow thistle (*Sonchus oleraceus*). Vegetation communities mapped within the 800-foot buffer of this station included: Coastal Bluff Scrub, Disturbed Coastal Bluff Scrub, Arroyo Willow Scrub, Turf Grass, and Ornamental Landscaping.

The intertidal habitat at this site is a pocket beach with rocky intertidal and tidepools at each end. The rocky intertidal supports surfgrass. A sea otter was observed offshore.

Vista del Mar Lift Station (Figure 4-5) – The vegetation at this site was sparse, dominated by native wild heliotrope on the rock face, with native prostrate coastal goldenbush on top of the bluffs. One native arroyo willow grows at the site. Additional species growing within the buffer area for this station include nonnative species, such as ripgut grass (Bromus diandrus), hottentot-

fig, bull thistle (Cirsium vulgare), flax-leaved horseweed, white cudweed, lavender (Lavandula sp.), cheeseweed, annual beard grass, rosemary (Rosmarinus officinalis), and Russian thistle (Salsola tragus). Vegetation communities mapped within the 800-foot buffer of this station included: Coastal Bluff Scrub, Disturbed Coastal Bluff Scrub, Monterey Cypress, and Ornamental Landscaping.

Marine habitats at this site include a red sand pocket beach with scattered low relief rocks at the southern end. Kelp beds occur offshore. A sea otter was observed by Chambers Group biologists in the kelp during the November, 2009, biological reconnaissance survey.

Ocean Park (Figure 4-6) - This lift station is immediately adjacent to Ocean Boulevard at a concrete wall that drops to a rocky beach below. English ivy and tree tobacco dominate the area. The adjacent Eldwayen Ocean Park is vegetated with Bermuda grass. A small patch of Mixed Willow Scrub with sparse arroyo willow trees is included within the buffer area. Additional species growing within the buffer area for this station include native species, such as: Menzies' goldenbush (*Isocoma menziesii* var. *menziesii*), and nonnative species such as: onionweed, flax-leaved horseweed, Bermuda grass, African daisy (*Osteospermum fruticosum*), rosemary, and sedum 'Autumn Joy' (*Sedum* sp.). Vegetation communities mapped within the 800-foot buffer of this station included: Coastal Bluff Scrub, Disturbed Coastal Bluff Scrub, Monterey Cypress, and Turf Grass.

The intertidal area was a cobble beach. Rocks and kelp beds were offshore. Brown pelicans, western gulls, and cormorants were roosting on the bluffs at this site and also on the offshore rocks. A sea otter was observed in the offshore kelp bed during the November, 2009, biological reconnaissance survey to assess biological resources at each of the sites.

Price Street - North (Figure 4-7) - This station contains a Freshwater Seep with approximately 85 percent vegetated cover dominated by native arroyo willow. Occasional large nonnative tree tobacco shrubs also were present, with the edges of the Freshwater Seep within the buffer area characterized by sparse but high quality Coastal Bluff Scrub. Additional species growing within the buffer area for this station include native species such as: California sagebrush, California buckwheat, telegraph weed, and prostrate coastal goldenbush, and nonnative species, such as: onionweed, foxtail chess (*Bromus madritensis* ssp. *rubens*), fennel, shortpod mustard, sweet-alyssum, boobialla, tree tobacco, and Russian thistle. Vegetation communities mapped within the 800-foot buffer of this station included: Coastal Bluff Scrub, Disturbed Coastal Bluff Scrub, Central Coastal Scrub, Arroyo Willow Scrub, Freshwater Seep, Monterey Cypress, and Ornamental Landscaping.

The riparian vegetation at this site supported a variety of birds, including black phoebe, yellow-rumped warbler, white crowned sparrow, ruby crowned kinglet, and house finch. A small pocket beach is at the base of the bluffs. Tidepools were present at the northwestern end of the site. These tidepools supported surfgrass and palm kelp (*Eisenia arborea*). A spotted sandpiper was observed foraging in the tidepools.

Figure 4-4:
Biological Resources at St. Andrews Lift Station

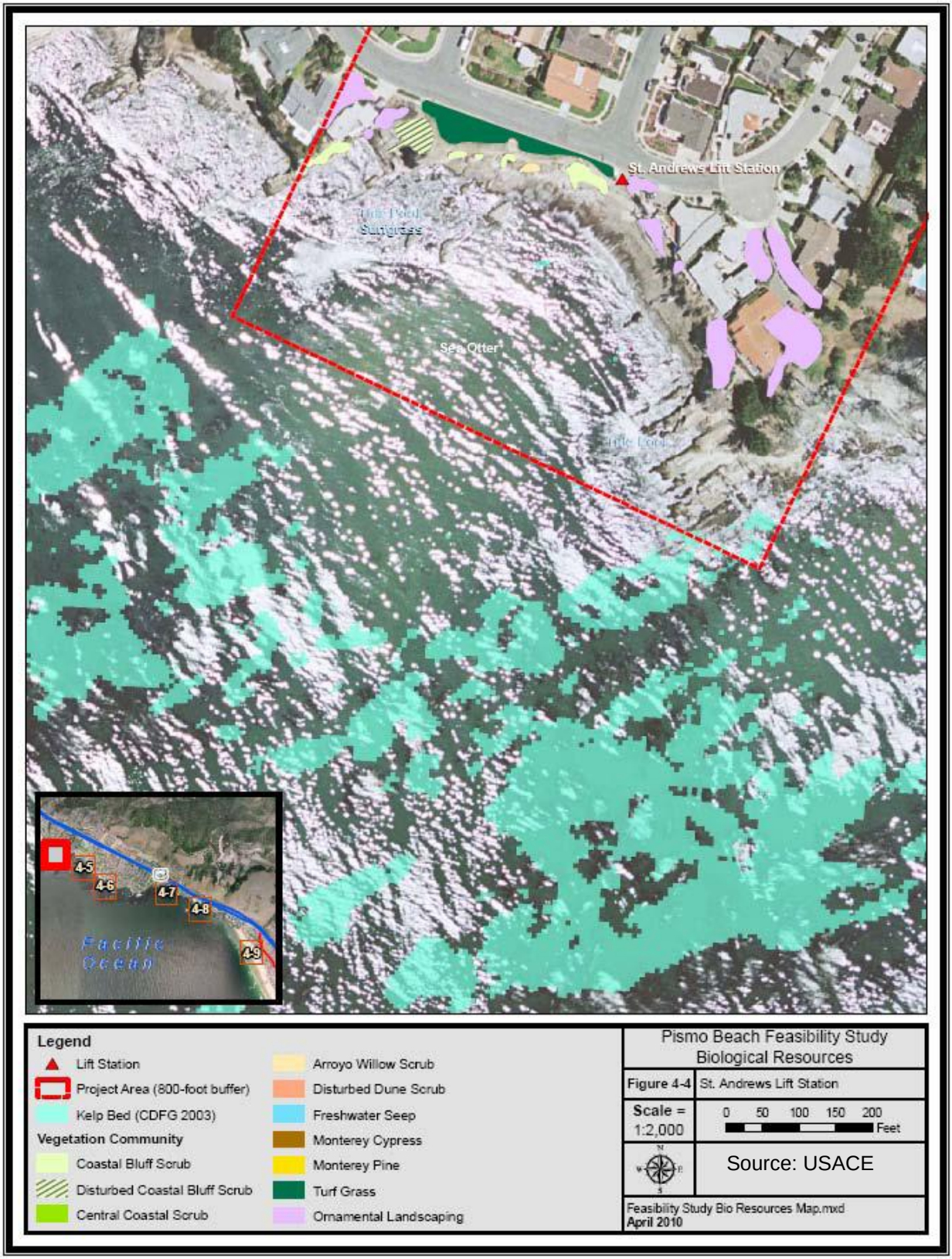


Figure 4-5:
Biological Resources at Vista del Mar Lift Station

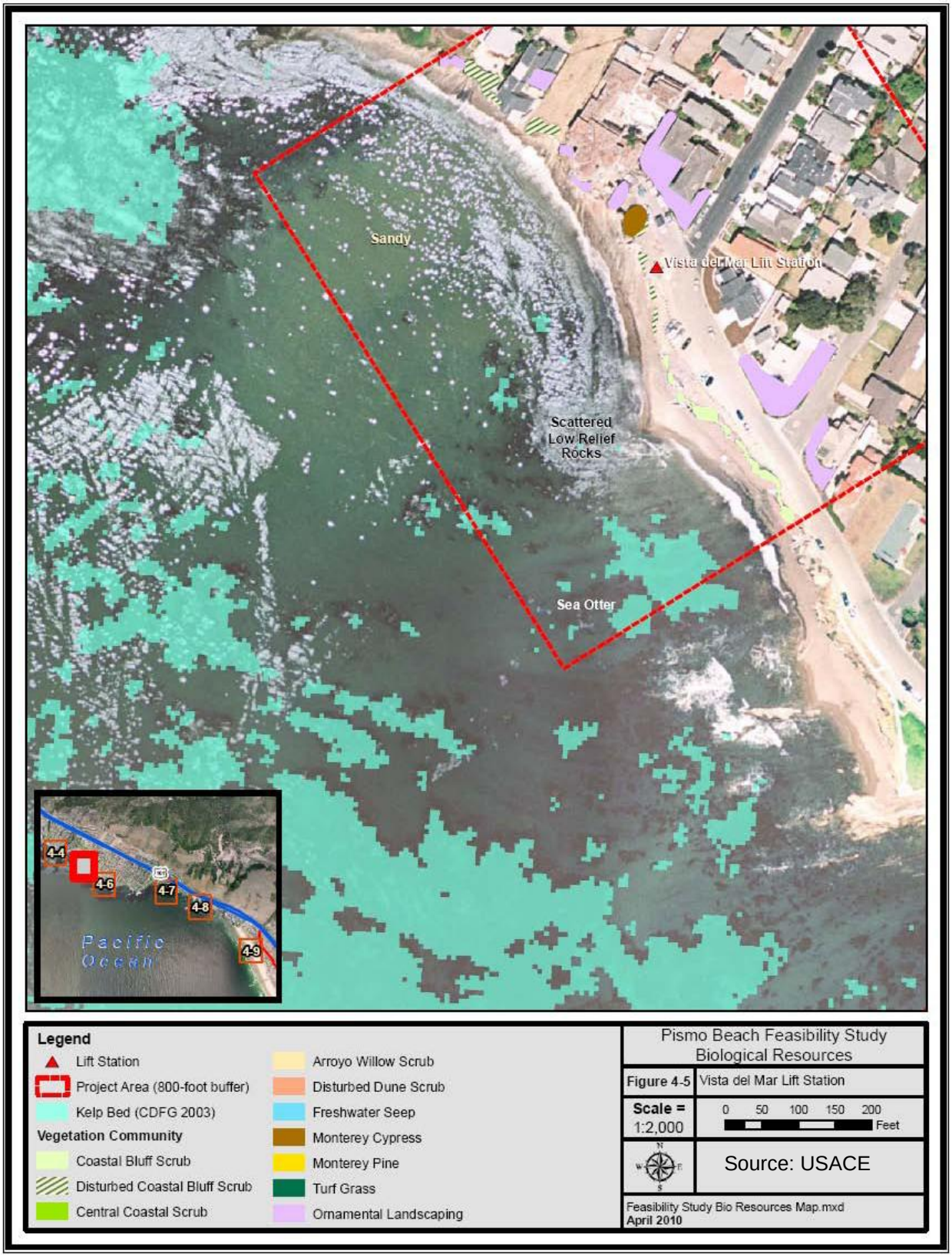


Figure 4-6:
Biological Resources at Ocean Park

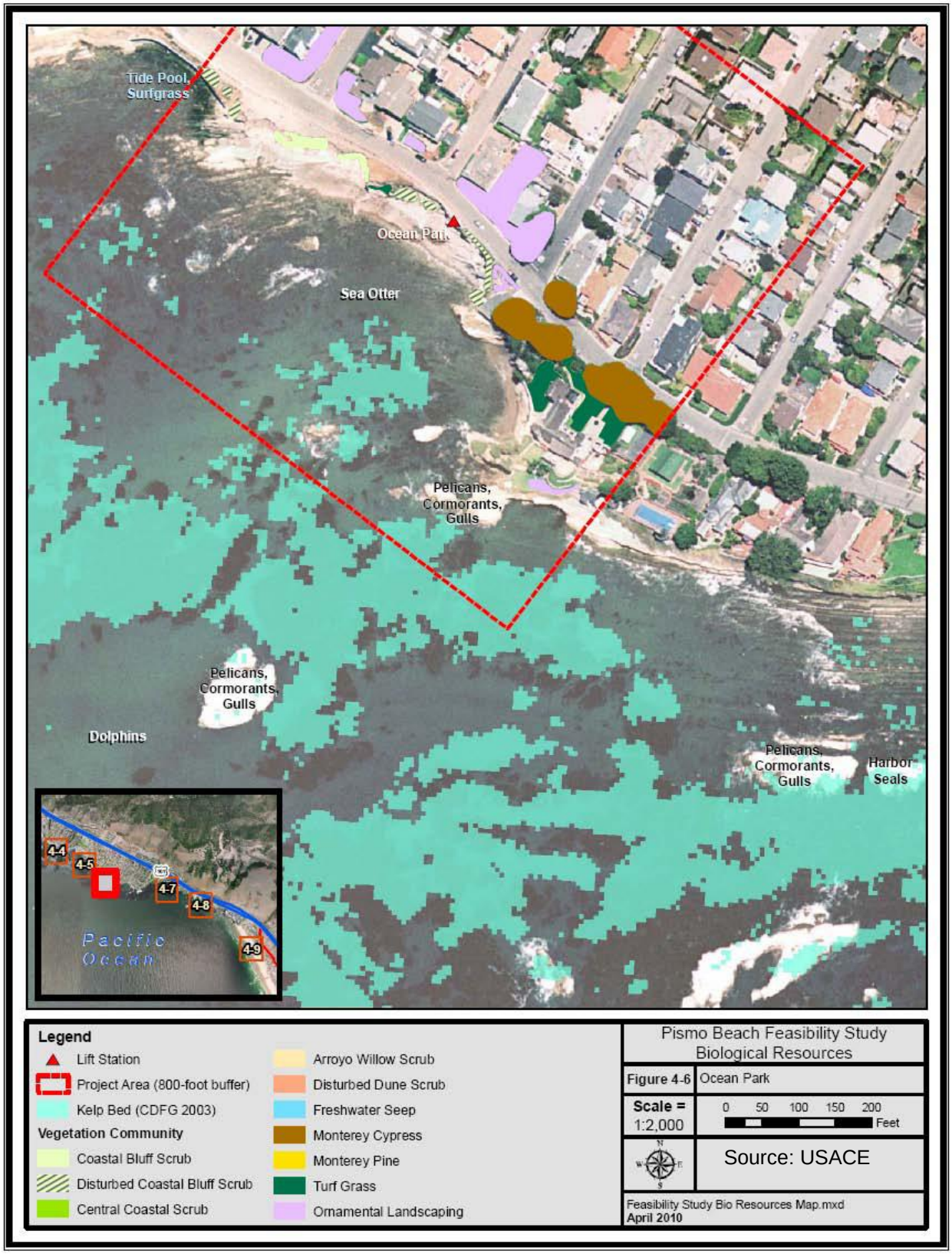
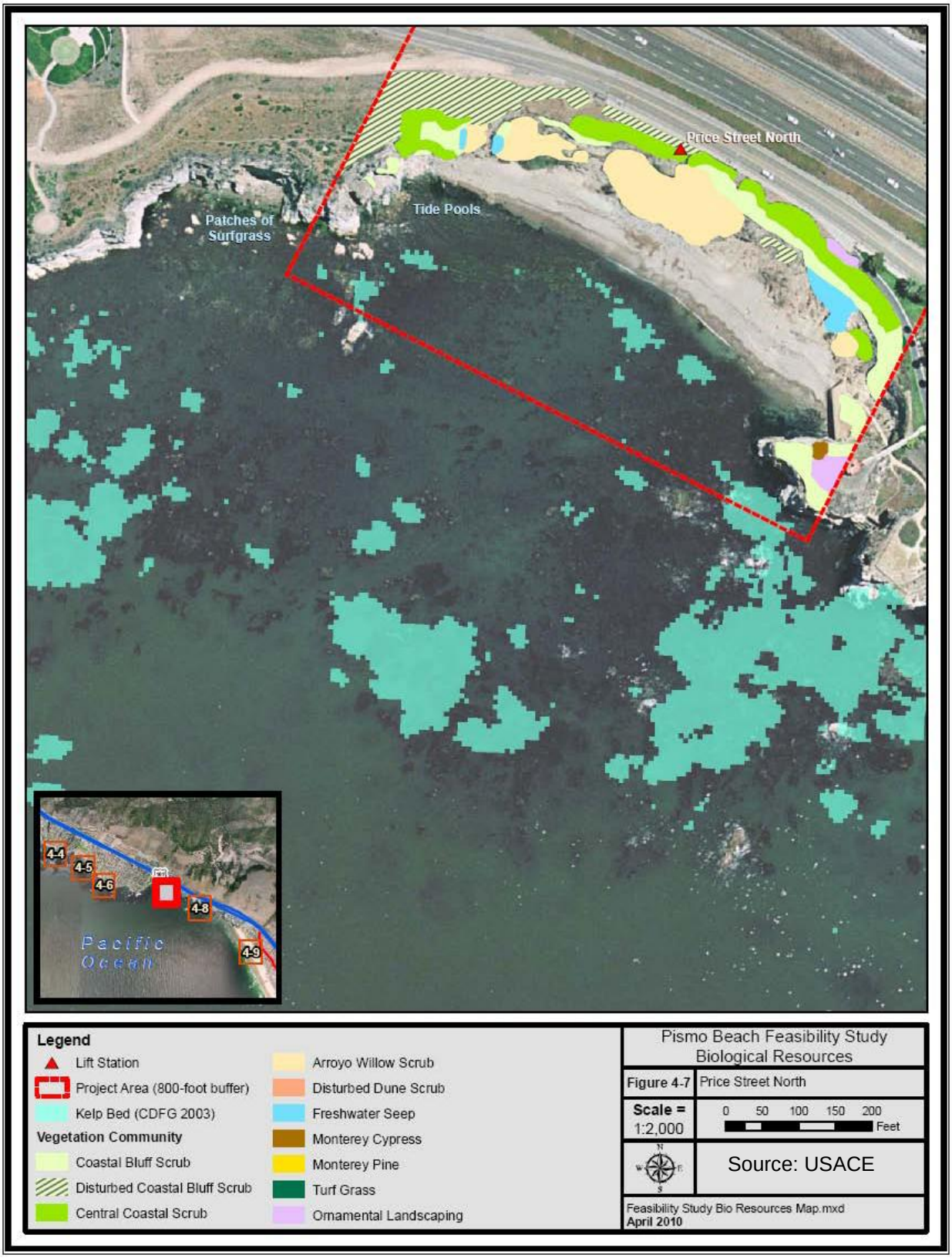


Figure 4-7:
Biological Resources at Price Street - North



Price Street - South (Figure 4-8) - The vegetative cover at the Price Street – South site was approximately 70 percent dominated by native coyote brush and occasional California sagebrush, with scattered nonnative tree tobacco shrubs. Below the wall is Coastal Bluff Scrub vegetation with approximately 15 percent overall vegetative cover. This area was dominated by native prostrate coastal goldenbush, with the northern edge of the cliff face dominated by nonnative sea-fig. This station is on a very steep cliff face with no beach access. Nonnative myoporum and native Monterey pine trees were growing at the base of the cliff. Additional species growing within the buffer area for this station include native species, such as California poppy, and prostrate coastal goldenbush. Nonnative species present within the buffer area include acacia (*Acacia* sp.), red-stemmed filaree, fennel, shortpod mustard, sweet-alyssum, horehound (*Marrubium vulgare*), African daisy, prickly sow thistle (*Sonchus asper* ssp. *asper*), and Russian thistle. Vegetation communities mapped within the 800-foot buffer of this station included:

Coastal Bluff Scrub, Disturbed Coastal Bluff Scrub, Central Coastal Scrub, Monterey Pine, and Ornamental Landscaping.

The bluffs and the offshore rocks in the Project area are used for roosting by brown pelicans, western gulls, and Brandt's cormorants. Harbor seals haul out on the offshore rocks.

Cypress Street Lift Station (Figure 4-9) - Unvegetated asphalt covers 15 feet of site from the lift station to the bluff edge. The plant species present within the buffer area of this station were dominated by nonnative hottentot-fig, Bermuda grass, and tree tobacco. Disturbed dune soil was located at the base of the bluff, and an expansive beach was present before the water's edge. Additional species growing within the buffer area for this station include native species, such as western bindweed and Monterey cypress and nonnative species such as straight tick (*Bidens frondosa*), sea rocket, sea-fig, fennel, Perez's sea-lavender (*Limonium perezii*), and sweet-alyssum. Vegetation communities mapped within the 800-foot buffer of this station included: Disturbed Coastal Bluff Scrub, Central Coastal Scrub, Disturbed Dune Scrub, Monterey Cypress, Freshwater Seep, Arroyo Willow Scrub, and Ornamental Landscaping. California ground squirrels were present on the bluffs. The marine habitats near this station included sandy beach and nearshore soft bottom.

Figure 4-8:
Biological Resources at Price Street - South

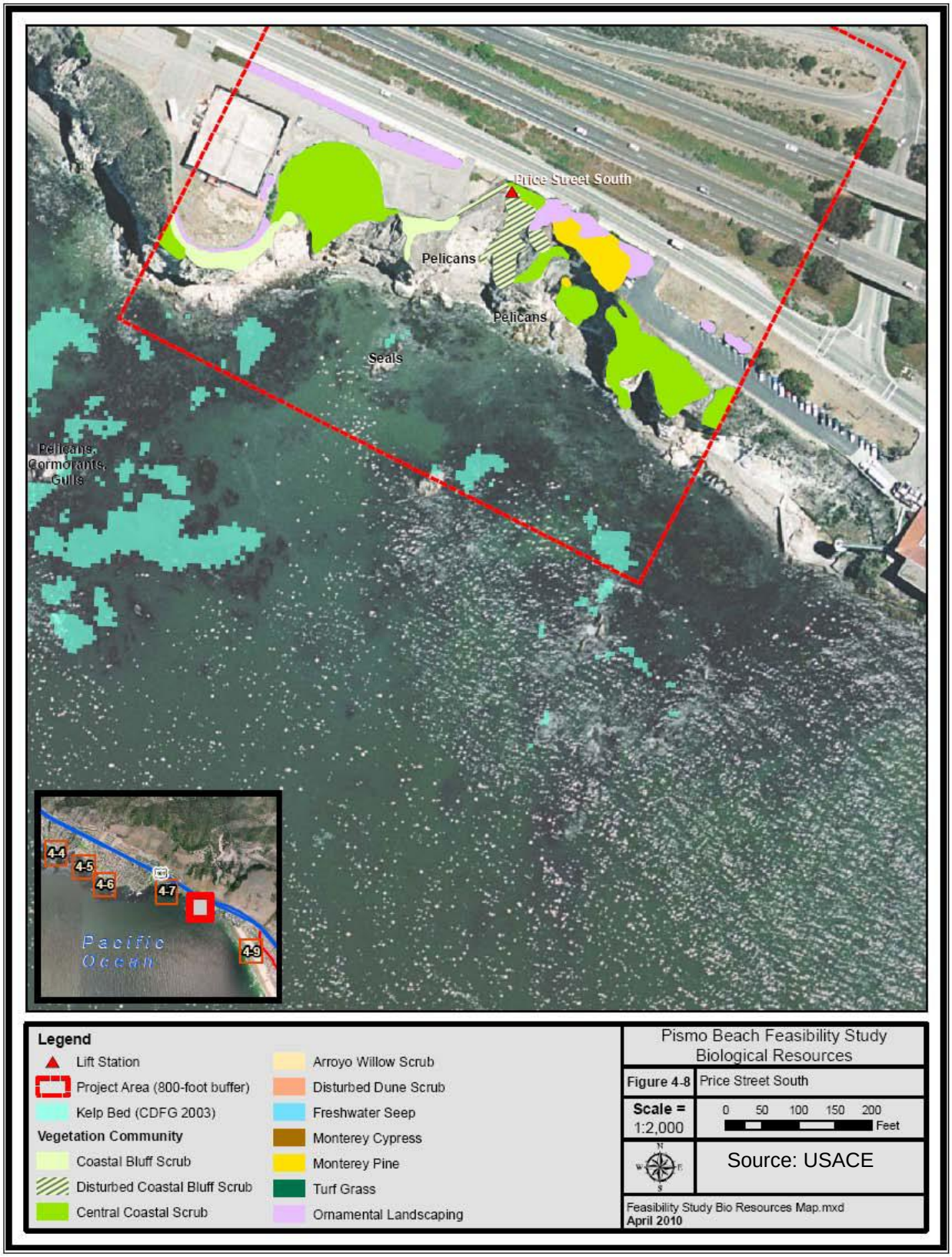
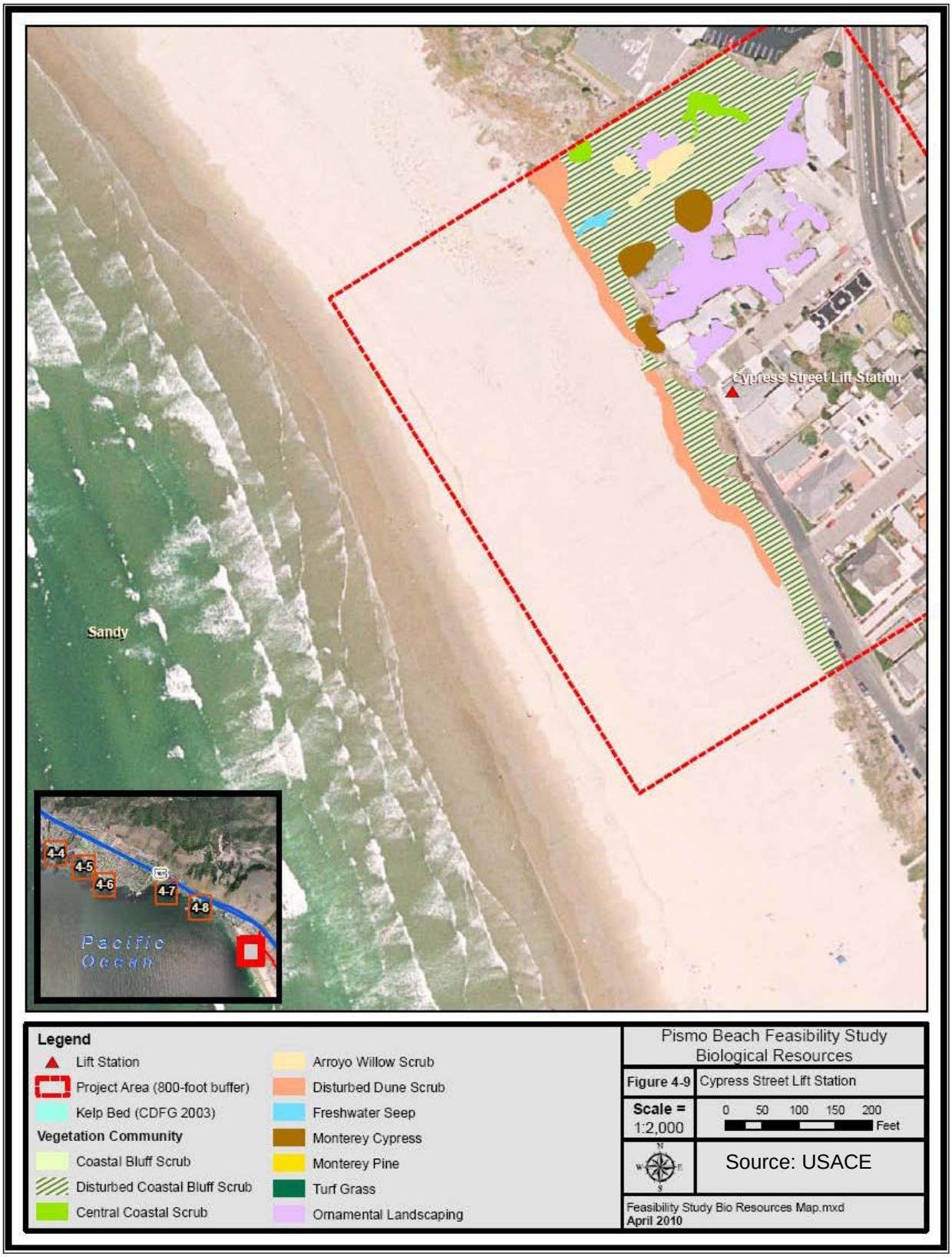


Figure 4-9:
Biological Resources at Cypress Street Lift Station



4.4.2 Environmental Consequences

4.4.2.1 Significance Criteria

An impact to biological resources will be considered significant if there are:

- impacts to aquatic plants for 10 years or longer directly or indirectly resulting in substantial changes in species composition or abundance beyond that of normal variability;
- impacts to attached or free-swimming animals for 10 years or longer directly or indirectly resulting in substantial changes in species composition or abundance beyond that of normal variability;
- loss of any rare, endangered, or sensitive species or permanent degradation of the habitat of those species; or
- permanent deterioration or contamination of the aquatic habitat such that the aquatic ecosystem of the site is substantially disrupted.

In evaluating the impacts of the alternative shore protection structures on marine habitat, the + 5 feet MLLW contour was used as an approximation of the high tide line. The + 5 feet MLLW contour lies between MHW, which is at + 4.68 feet MLLW and MHHW, which is at + 5.39 feet MLLW.

4.4.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

The rock revetment at the St. Andrews Lift Station site would extend for an alongshore length of 110 feet and would extend up to + 22 feet MLLW on the bluff face. The footprint on the bluff face would be 0.09 acre and on the beach would be 0.18 acre. Of the 0.18 acre on the beach that the revetment would cover, approximately half (0.09 acre) would be sandy beach, and the remaining 0.09 acre would be rocky habitat. The revetment would extend seaward to an elevation of + 4 feet MLLW. Approximately 0.02 acre of the revetment beach footprint would be below + 5 feet MLLW. Beach at this site currently includes 0.57 acre of sandy beach and 0.38 acre of rocky habitat. Therefore, the revetment footprint would cover approximately 19 percent of the beach.

The construction of the revetment on the bluffs at the St. Andrews Lift Station site will permanently impact a small amount of scattered coastal bluff scrub. This coastal bluff scrub is vulnerable to erosion as well as wave impact during high surf and tide conditions and may be lost even without revetment construction. The revetment construction also may affect the one willow bush that occurs on the bluff near the site. The loss of less than 0.09 acre of patchy coastal bluff scrub and one willow bush is an insignificant impact because it would not result in a substantial change beyond normal variability of the plant communities on the bluff.

The construction of the revetment at the St. Andrews Lift Station site would result in the permanent loss of about 0.09 acre of sandy beach. Most of the sandy beach that would be lost would be above +5 feet MLLW (based on the September 2009 beach condition) and all of it would be above +4 feet MLLW. Sandy beach organisms that occupy these high intertidal zones include beach hoppers (*Megalorchestia* spp.) and insects such as kelp flies that are associated with the macrophyte wrack that tends to accumulate at the high tide line. These organisms provide a food base for birds that forage on the beach. In addition to the actual loss of sandy beach habitat to the revetment footprint, there is some evidence that shoreline structures, especially structures that extend below mean higher high water elevation, result in a degradation of the macroinvertebrate community by changing community composition and reducing species diversity (Sobcinski et al. 2010). Therefore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself.

The high intertidal also provides spawning area for grunion. However, the lack of a substantial sand beach at the St. Andrews Lift Station site makes it poor grunion spawning habitat. The sand on this beach tends to come and go depending on oceanographic conditions. The loss of a small amount of seasonally-fluctuating sand beach at the St. Andrews Lift Station site would be insignificant.

Harbor seals haul out on offshore rocks and beaches in the Project area. They may at times haul out on the pocket beach below the St. Andrews Lift Station. The revetment construction at this site will replace 0.18 acre of upper beach; however, the revetment will not affect any beach below +4 feet MLLW. Therefore, all of the beach will still be available for harbor seals during low tides when they typically haul out, and 81 percent of the total beach area at this site would be unaffected by the revetment. Impacts would be insignificant.

The revetment footprint also would cover 0.09 acre of rocky habitat above +4 MLLW elevation. The rocky intertidal habitat covered by revetment would be in the high intertidal to splash zone. This zone is characterized by green algae, barnacles, periwinkle snails, and limpets. The revetment rocks would support a similar assemblage of organisms. Therefore, the covering of high intertidal rocks with revetment boulders at the St. Andrews Lift Station site would be an insignificant impact. Revetment construction would not affect the important aquatic plant species, kelp and surfgrass, which are found in the lower intertidal (0 MLLW and below) and subtidal.

Activity, equipment, and workers during construction of a revetment at the St. Andrews Lift Station site would disturb wildlife on the beach and bluffs. It would take about three months to construct the revetment at the St. Andrews Lift Station site. Birds and mammals that use the beach and bluffs likely would avoid the area during construction. Temporary avoidance of a limited amount of coastal bluff and pocket beach habitat would be an insignificant impact. However, harbor seals may haul out on the pocket beach at the St. Andrews Lift Station site. Temporary avoidance of the beach by harbor seals would be an insignificant impact because numerous other haul-out sites are available in the local area, and the St. Andrews Lift Station has not been identified as an important harbor seal haul-out site. However, if harbor seals are hauled out on the beach during a lull in construction activity, disturbance of those seals by a resumption of work would constitute harassment under the Marine Mammal Protection Act. This impact can be avoided by implementation of the following measure.

- Before beginning any construction activities on the site, it shall be determined whether any harbor seals are hauled out on the beach. If harbor seals are observed on the beach, no construction activities shall occur until the seals leave the beach.

Because of the lack of appropriate habitat, no sensitive plant species would be affected by construction of a revetment at the St. Andrews Lift Station site. The only sensitive animal species that would occur on the bluffs or beach where revetment construction would take place would be the Federal threatened western snowy plover.

As discussed above in Section 4.2.2, there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the St. Andrews Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the St. Andrews Lift Station site. Foraging would be most likely to occur in the high intertidal, which will be affected by revetment construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.18 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the following mitigation measure:

- A biological monitor shall be present during any construction activities on the site during the first week. If snowy plovers are observed near the construction area, the monitor will advise the work crews on how to avoid or minimize impacts to plover, which may include temporarily halting activities, until the plovers have left the site. Minimization measures shall continue throughout site construction.

With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The tidepool habitat on either end of the pocket beach at the St. Andrews Lift Station site and the rocky formations offshore potentially could support black abalone. The footprint of the revetment would not extend into these areas. The rocks within the revetment footprint are isolated, low-relief boulders that would not support black abalone.

Alternative 2: Vertical Sea Wall

The vertical sea wall at the St. Andrews Lift Station site would extend for an alongshore length of 110 feet and would extend up to +20 feet MLLW on the bluff face. The footprint on the bluff face would be 0.09 acre, and the footprint on the beach would be 0.06 acre, of which half (0.03 acre) would be sandy beach and half would be rocky habitat. The sea wall would extend seaward to an elevation of +8 feet MLLW. Approximately 0 acre of the seawall beach footprint would be below MHHW. Beach at this site currently includes 0.57 acre of sandy beach and 0.38 acre of rocky habitat. The sea wall would, thus, affect 6 percent of the total beach at this site.

The impacts of the vertical sea wall on bluff vegetation would be similar to the impacts of the revetment. Less than 0.09 acre of patchy coastal bluff scrub and possibly one willow bush may be lost. The impacts of the vertical sea wall on bluff vegetation would be insignificant.

Construction of a vertical sea wall at the St. Andrews Lift Station site would impact 0.06 acre of sandy and rocky beach habitat above +8 feet, which is above the intertidal zone. Sea water would only reach this area during periods of high tides, large surf and extreme storm run-up. Therefore, intertidal organisms would not be affected. The impacts of the vertical sea wall on the intertidal macroinvertebrate community would be less than the rock revetment. Birds may sometimes forage on insects in this upper beach area. The loss of 0.06 acre of beach habitat above the intertidal zone would be an insignificant impact. Like the revetment alternative, the vertical sea wall alternative would have no impact on kelp or surfgrass.

The impacts of construction activity for a vertical sea wall at the St. Andrews Lift Station site would be similar to the impacts described above for a revetment. The vertical sea wall would require four months to construct compared to three months for a rock revetment so the disturbance to birds and wildlife of a vertical sea wall would last one month longer than for a revetment, but the impacts would still be insignificant. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach, would be reduced to insignificant by implementing the same measures described for the rock revetment alternative.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the St. Andrews Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the St. Andrews Lift Station site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.06 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described above for the rock revetment. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The tidepool habitat northwest of the pocket beach at the Ocean Park site and the rocky formations offshore potentially could support black abalone. The footprint of the sea wall would not extend into any intertidal rocky habitat.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The footprint of the sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be identical to the footprint of the vertical sea wall. Therefore, the permanent impacts to habitats of the sculpted concrete/shotcrete wall would be the same as the vertical sea wall and would be insignificant.

The construction impacts of the sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be similar to those of the vertical sea wall and the revetment with the exception that the duration of construction would be five months for the sculpted concrete/shotcrete wall compared to four months for the vertical sea wall and three months for the rock revetment. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach, would be reduced to insignificant by implementing the same measures described in the rock revetment alternative.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This

impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the St. Andrews Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the St. Andrews Lift Station site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.06 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described above for the rock revetment. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the St. Andrews Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The tidepool habitat northwest of the pocket beach at the Ocean Park site and the rocky formations offshore potentially could support black abalone. The footprint of the sea wall would not extend into any intertidal rocky habitat.

No Action Alternative

Under the No Action alternative, the bluff at the St. Andrews Lift Station site would continue to erode. Bluff erosion at this site might result in the loss of some or all of the bluff vegetation. Continued erosion has the potential to result in the construction of emergency revetments or sea walls that would have similar impacts to beach biological resources as the proposed structures.

4.4.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

The rock revetment at the Vista del Mar Lift Station site would extend alongshore for 120 feet and up the bluffs to an elevation of + 22 feet MLLW. The footprint of the revetment would be 0.04 acre on the bluff face and 0.17 acre on the beach, all of which would be sandy beach habitat. The revetment would extend seaward to an elevation of + 4 feet MLLW. Based on the

September 2009 beach condition, approximately 0.04 acre of the revetment footprint on the beach would be below + 5 feet MLLW. Beach at this site currently includes 2.32 acres of sandy beach and 0.26 acre of rocky habitat. The footprint of the revetment would cover approximately 7 percent of the beach at this site.

The construction of the revetment on the bluffs at the Vista del Mar Lift Station site will permanently impact a small amount of scattered coastal bluff scrub. This coastal bluff scrub is vulnerable to erosion as well as wave impact during high surf and tide conditions and may be lost even without revetment construction. The loss of less than 0.04 acre of patchy coastal bluff scrub is an insignificant impact because it would not result in a substantial change beyond normal variability of the plant communities on the bluff.

The construction of the revetment at the Vista del Mar Lift Station site would result in the permanent loss of about 0.17 acre of sandy beach. Of this 0.17 acre, 0.04 would be below + 5 feet MLLW. Therefore, the majority of the sandy beach habitat that would be permanently lost at this site would be in the uppermost intertidal zone or above the normal reach of the tides. Sandy beach organisms that occupy these high intertidal zones include beach hoppers and insects such as kelp flies that are associated with the macrophyte wrack that tends to accumulate at the high tide line. These organisms provide a food base for birds that forage on the beach. In addition to the actual loss of sandy beach habitat to the revetment footprint, there is some evidence that shoreline structures, especially structures that extend below mean higher high water elevation, result in a degradation of the macroinvertebrate community by changing community composition and reducing species diversity (Sobcinski et al. 2010). Therefore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself.

The high intertidal also provides spawning area for grunion. However, the lack of a substantial sand beach at the Vista del Mar Lift Station site makes it poor grunion spawning habitat. The sand on this beach tends to fluctuate, depending on oceanographic conditions.

The 0.17 acre of sandy beach habitat that will be covered by revetment would be expected to be colonized by plants and invertebrates characteristic of the rocky intertidal splash zone. This zone is characterized by green algae, barnacles, periwinkle snails, and limpets. The replacement of a small amount of seasonally-fluctuating upper sand beach at the Vista del Mar Lift Station site by revetment boulders would be insignificant.

Activity, equipment and workers involved in construction of a revetment at the Vista del Mar Lift Station site would disturb wildlife on the beach and bluffs. About three months would be required to construct the revetment at the Vista del Mar Lift Station site. Birds and mammals that use the beach and bluffs likely would avoid the area during construction. Temporary avoidance of a limited amount of disturbed coastal bluff and pocket beach habitat would be an insignificant impact. Harbor seals haul out on offshore rocks and beaches in the Project area. They may at times haul out on the pocket beach below the Vista del Mar Lift Station. The revetment construction at this site will replace 0.17 acre of upper beach. However, the revetment would affect only 6 percent of the total beach area at this site and will not affect any beach below + 4 feet MLLW. Therefore, beach will still be available for harbor seals, especially during low tides when they typically haul out. Temporary avoidance of the beach by harbor seals would be an insignificant impact because numerous other haul-out sites are available in the local area, and the

Vista del Mar Lift Station has not been identified as an important harbor seal haul-out site. However, if harbor seals are hauled out on the beach during a lull in construction activity, disturbance of those seals by a resumption of work would constitute harassment under the Marine Mammal Protection Act. This impact would be avoided by implementing the harbor seal measure described in the rock revetment alternative for the St. Andrews Lift Station site.

Because of the lack of appropriate habitat, no sensitive plant species would be affected by construction of a revetment at the Vista del Mar Lift Station site. The only sensitive animal species that may occur on the bluffs or beach where revetment construction would take place would be the Federal threatened western snowy plover.

As discussed above in Section 4.2.2, there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Vista del Mar Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Vista del Mar Lift Station site. Foraging would be most likely to occur in the high intertidal, which will be affected by revetment construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.17 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The revetment would not extend into rocky intertidal habitat.

Alternative 2: Vertical Sea Wall

The vertical sea wall at the Vista del Mar Lift Station site would extend for an alongshore length of 120 feet and would extend up to + 20 feet MLLW on the bluff face. The footprint on the bluff

face would be 0.04 acre, and the footprint on the beach would be 0.06 acre of sand beach. The sea wall would extend seaward to an elevation of +8 feet MLLW. Approximately 0 acre of the seawall beach footprint would be below mean higher high water. Beach at this site currently includes 2.32 acres of sandy beach and 0.26 acre of rocky habitat. The footprint of the sea wall would cover about 2 percent of the beach area at this site.

The impacts of the vertical sea wall on bluff vegetation would be similar to the impacts of the revetment. Less than 0.04 acre of patchy disturbed coastal bluff scrub may be lost. The impacts of the vertical sea wall on bluff vegetation would be insignificant.

Construction of a vertical sea wall at the Vista del Mar Lift Station site would impact 0.06 acre of sandy beach habitat above + 8 feet, which is above the intertidal zone. Sea water would reach this area only during periods of high tides, large surf, and extreme storm run-up. Intertidal organisms would be affected minimally. The vertical sea wall may result in some indirect adverse effect on the macroinvertebrate community, but the effect would be less than the rock revetment. Birds may sometimes forage on insects in this upper beach area. The loss of 0.06 acre of beach habitat above the intertidal zone would be an insignificant impact.

The impacts of construction activity for a vertical sea wall at the Vista del Mar Lift Station site would be similar to the impacts described above for a revetment. The vertical sea wall would take four months to construct compared to three months for a rock revetment; the disturbance to birds and wildlife of a vertical sea wall would last one month longer than for a revetment, but the impacts would still be insignificant. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach, would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment and Countermeasures Plan.

Threatened and Endangered Species

<u>Western Snowy Plover</u>: Would not adversely affect. No snowy plovers nest on the beach at the Vista del Mar Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Vista del Mar Lift Station site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.06 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into any intertidal rocky habitat.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The footprint of the sculpted concrete/shotcrete wall at the Vista del Mar Lift Station site would be identical to the footprint of the vertical sea wall. Therefore, the permanent impacts to habitats of the sculpted concrete/shotcrete wall would be the same as the vertical sea wall and would be insignificant.

The construction impacts of the sculpted concrete/shotcrete wall at the Vista del Mar Lift Station site would be similar to those of the vertical sea wall and the revetment, with the exception that the duration of construction would be five months for the sculpted concrete/shotcrete wall compared to four months for the vertical sea wall and three months for the rock revetment. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach, would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Vista del Mar Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Vista del Mar Lift Station site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.06 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station

site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Vista del Mar Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into any intertidal rocky habitat.

No Action Alternative

Under the No Action alternative, the bluff at the Vista del Mar Lift Station site would continue to erode. Bluff erosion at this site might result in the loss of some or all of the bluff vegetation. Continued erosion has the potential to result in the construction of emergency revetments or sea walls that would have similar impacts to beach biological resources as the proposed structures.

4.4.2.4 Ocean Park

Alternative 1: Rock Revetment

The rock revetment at the Ocean Park site would extend for an alongshore length of 150 feet and would extend up to + 22 feet MLLW on the bluff face. The footprint on the bluff face would be 0.07 acre and on the beach would be 0.20 acre. Of the 0.20 acre on the beach that the revetment would cover, approximately 0.14 acre would be sandy beach and the remaining 0.06 acre would be rocky habitat. The revetment would extend seaward to an elevation of + 3 feet MLLW. Approximately 0.06 acre of the revetment beach footprint would be below + 5 feet MLLW. Beach at this site currently includes 0.23 acre of sandy beach and 0.16 acre of rocky habitat. The revetment would cover 51 percent of the total beach area at this site.

The construction of the revetment on the bluffs at the Ocean Park site will permanently impact a small amount of disturbed coastal bluff scrub dominated by nonnative species. This coastal bluff scrub is vulnerable to erosion as well as wave impact during high surf and tide conditions and may be lost even without revetment construction. The loss of less than 0.07 acre of disturbed coastal bluff scrub is an insignificant impact because it would not result in a substantial change beyond normal variability of the plant communities on the bluff.

The construction of the revetment at the Ocean Park site would result in the permanent loss of about 0.14 acre of sandy beach. Much of the sandy beach that would be lost would be above + 5 feet MLLW (based on the September 2009 beach condition), and all of it would be above + 3

feet MLLW. Thus the sandy beach habitat affected at the Ocean Park site would extend from upper beach above the reach of the tides, except under extreme storm surge conditions, to mean sea level. Sandy beach organisms that occupy the high intertidal and splash zones include beach hoppers and insects such as kelp flies that are associated with the macrophyte wrack that tends to accumulate at the high tide line. The mid-tide zone is characterized by the isopod *Excirolana*. These organisms provide a food base for birds that forage on the beach. In addition to the actual loss of sandy beach habitat to the revetment footprint, there is some evidence that shoreline structures, especially structures that extend below mean higher high water elevation, result in a degradation of the macroinvertebrate community by changing community composition and reducing species diversity (Sobcinski et al. 2010). Therefore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself.

The high intertidal also provides spawning area for grunion. However, the lack of a substantial sand beach at the Ocean Park site makes it poor grunion spawning habitat. The sand on this beach fluctuates based on oceanographic conditions. The loss of a small amount of seasonally-fluctuating sand beach at the Ocean Park site would be insignificant.

Harbor seals haul out on offshore rocks and beaches in the Project area. They may at times haul out on the pocket beach below the Ocean Park site. The revetment construction at this site will replace 0.20 acre of upper beach. However, the revetment will not affect any beach below + 3 feet MLLW. Therefore, beach still will be available for harbor seals during low tides when they typically haul out, and 49 percent of the total beach area would be unaffected by the revetment. Impacts of loss of beach for hauling out would be insignificant. Harbor seals may avoid the beach altogether during construction. Temporary avoidance of the beach by harbor seals would result in an insignificant impact because numerous other haul-out sites are available in the local area and the Ocean Park has not been identified as an important harbor seal haul-out site. However, if harbor seals are hauled out on the beach during a lull in construction activity, disturbance of those seals by a resumption of work would constitute harassment under the Marine Mammal Protection Act. This impact can be avoided by implementing the harbor seal measure described in the rock revetment alternative for the St. Andrews Lift Station site.

The revetment footprint also would cover 0.06 acre of rocky habitat above + 3 MLLW elevation. The rocky intertidal habitat covered by revetment would be in the mid-intertidal to splash zone. The upper zones are characterized by green algae, barnacles, periwinkle snails, and limpets. The revetment rocks would support a similar assemblage of organisms. Therefore, the covering of high intertidal rocks with revetment boulders at the Ocean Park site would be an insignificant impact. Revetment construction would not affect the important aquatic plant species, kelp and surfgrass, which are found in the lower intertidal (0 MLLW and below) and subtidal.

Activity, equipment, and workers involved in construction of a revetment at the Ocean Park site would disturb wildlife on the beach and bluffs. About three months would be required to construct the revetment at the Ocean Park site. Birds and mammals that use the beach and bluffs likely would avoid the immediate area during construction. Temporary avoidance of a limited amount of disturbed coastal bluff and pocket beach habitat would be an insignificant impact. Brown pelicans, cormorants, and gulls roost on the bluffs a couple of hundred feet downcoast from the site. These birds may be disturbed by the construction activities, but because they

routinely roost on these bluffs near a large amount of human activity, it is expected that they will adjust to the construction and continue to occupy the roost site.

Because of the lack of appropriate habitat, no sensitive plant species would be affected by construction of a revetment at the Ocean Park site. The only sensitive animal species that would occur on the bluffs or beach where revetment construction would take place would be the Federal threatened western snowy plover.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Ocean Park site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Ocean Park site. Foraging would be most likely to occur in the high intertidal, which will be affected by revetment construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.20 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Ocean Park site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Ocean Park site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Ocean Park site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The tidepool habitat northwest of the pocket beach at the Ocean Park site and the rocky formations offshore potentially could support black abalone. The footprint of the revetment would not extend into these areas.

Alternative 2: Vertical Sea Wall

The vertical sea wall at the Ocean Park site would extend for an alongshore length of 150 feet and would extend up to + 20 feet MLLW on the bluff face. The footprint on the bluff face would be 0.07 acre, and the footprint on the beach would be 0.08 acre, of which half (0.04 acre) would be sandy beach and half would be rocky habitat. The sea wall would extend seaward to an

elevation of + 8 feet MLLW. The vertical sea wall would cover about 20 percent of the beach at this site.

The impacts of the vertical sea wall on bluff vegetation would be similar to the impacts of the revetment. Less than 0.07 acre of disturbed coastal bluff scrub may be lost. The impacts of the vertical sea wall on bluff vegetation would be insignificant.

Construction of a vertical sea wall at the Ocean Park site would impact 0.04 acre of sandy beach and 0.04 acre of rocky beach habitat above + 8 feet, which is above the intertidal zone. Sea water would reach this area only during periods of high tides, large surf, and extreme storm run-up. Therefore, intertidal organisms would not be affected. The vertical sea wall may result in some degradation of the macroinvertebrate community, but the impact would be less than that of a rock revetment. Birds may sometimes forage on insects in this upper beach area. The loss of 0.08 acre of beach habitat above the intertidal zone would be an insignificant impact. Like the revetment alternative, the vertical sea wall alternative would have no impact on kelp or surfgrass.

The impacts of construction activity for a vertical sea wall at the Ocean Park site would be similar to the impacts described above for a revetment. The vertical sea wall would require four months to construct compared to three months for a rock revetment, so the disturbance to birds and wildlife of a vertical sea wall would last one month longer than for a revetment; but the impacts would still be insignificant. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Ocean Park site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Ocean Park site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.08 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Ocean Park site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Ocean Park site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Ocean Park site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into any rocky intertidal habitat.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The footprint of the sculpted concrete/shotcrete wall at the Ocean Park site would be identical to the footprint of the vertical sea wall. Therefore, the permanent impacts to habitats of the sculpted concrete/shotcrete wall would be the same as the vertical sea wall and would be insignificant.

The construction impacts of the sculpted concrete/shotcrete wall at the Ocean Park site would be similar to those of the vertical sea wall and the revetment with the exception that the duration of construction would be five months for the sculpted concrete/shotcrete wall compared to four months for the vertical sea wall and three months for the rock revetment. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Ocean Park site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Ocean Park site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.08 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Ocean Park site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Ocean Park site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Ocean Park site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the seawall would not extend into rocky intertidal habitat.

No Action Alternative

Under the No Action alternative, the bluff at the Ocean Park site would continue to erode. Bluff erosion at this site might result in the loss of some or all of the bluff vegetation. Continued erosion has the potential to result in the construction of emergency revetments or sea walls that would have similar impacts to beach biological resources as the proposed structures.

4.4.2.5 Price Street – North

Alternative 1: Rock Revetment

The rock revetment at the Price Street - North site would extend for an alongshore length of 270 feet and would extend up to + 22 feet MLLW on the bluff face. The footprint on the bluff face would be 0.31 acre and on the beach would be 0.39 acre. Of the 0.39 acre on the beach that the revetment would cover, approximately 0.23 acre would be sandy beach and the remaining 0.16 acre would be rocky habitat. The revetment would extend seaward to an elevation of + 4 feet MLLW. Approximately 0.03 acre of the revetment beach footprint would be below + 5 feet MLLW. Beach at this site currently includes 1.38 acres of sandy beach and 0.34 acre of rocky habitat. Therefore construction of a revetment at this site would affect 23 percent of the total beach area.

The construction of the revetment on the bluffs at the Price Street - North site will permanently impact much of the largest patch of arroyo willow scrub on the bluffs at this site. These willows are used by a variety of birds. The application of shotcrete above the revetment also may impact some coastal bluff scrub. This willow and coastal bluff scrub is vulnerable to erosion as well as wave impact during high surf and tide conditions and may be lost even without revetment construction. The loss of less than 0.31 acre of arroyo willow and coastal bluff scrub is an insignificant impact because it would not result in a substantial change beyond normal variability of the plant communities on the bluff.

The construction of the revetment at the Price Street - North site would result in the permanent loss of about 0.23 acre of sandy beach. Most of the sandy beach that would be lost would be above +5 feet MLLW (based on the September 2009 beach condition) and all the sandy beach above + 4 feet MLLW would be lost. Sandy beach organisms that occupy the high intertidal and splash zones include beach hoppers and insects such as kelp flies that are associated with the macrophyte wrack that tends to accumulate at the high tide line. These organisms provide a food base for birds that forage on the beach. In addition to the actual loss of sandy beach habitat to the

revetment footprint, there is some evidence that shoreline structures, especially structures that extend below mean higher high water elevation, result in a degradation of the macroinvertebrate community by changing community composition and reducing species diversity (Sobcinski et al. 2010). Therefore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself.

The high intertidal also provides spawning area for grunion. However, the lack of a substantial sand beach at the Price Street - North site makes it poor grunion spawning habitat. The sand on this beach tends to fluctuate, depending on oceanographic conditions. The loss of a small amount of seasonally-fluctuating sand beach at the Price Street - North site would be insignificant.

Harbor seals haul out on offshore rocks and beaches in the Project area. They may at times haul out on the pocket beach below the Price Street - North site. The revetment construction at this site will replace 0.23 acre of upper beach. However, the revetment will not affect any beach below + 4 feet MLLW; therefore, beach still will be available for harbor seals during low tides when they typically haul out, and only 23 percent of the total beach area at Price Street - North will be affected. Impacts would be insignificant. Harbor seals also may haul out on the pocket beach at the Price Street - North site. Harbor seals may avoid the beach altogether when construction activities are taking place. Temporary avoidance of the beach by harbor seals would be an insignificant impact because numerous other haul-out sites are available in the local area, and the Price Street - North beach has not been identified as an important harbor seal haul-out site. However, if harbor seals are hauled out on the beach during a lull in construction activity, disturbance of those seals by a resumption of work would constitute harassment under the Marine Mammal Protection Act. This impact can be avoided by implementing the harbor seal measure described in the rock revetment alternative for the St. Andrews Lift Station site.

The revetment footprint also would cover 0.16 acre of rocky habitat above + 4 feet MLLW elevation. The footprint of the revetment would not extend into the tidepools at the northwestern end of the beach. The rocky intertidal habitat covered by revetment would be primarily in the upper intertidal zone. The upper zones are characterized by green algae, barnacles, periwinkle snails, and limpets. The revetment rocks would support a similar assemblage of organisms. Therefore, the covering of high intertidal rocks with revetment boulders at the Price Street - North site would be an insignificant impact. Revetment construction would not affect the important aquatic plant species, kelp and surfgrass, which are found in the lower intertidal (0 MLLW and below) and subtidal.

Activity, equipment, and workers involved in construction of a revetment at the Price Street - North site would disturb wildlife on the beach and bluffs. About five months would be required to construct the revetment at the Price Street - North site. Birds and mammals that use the beach and bluffs likely would avoid the immediate area during construction. Temporary avoidance of a limited amount of disturbed coastal bluff and pocket beach habitat would be an insignificant impact.

Because of the lack of appropriate habitat, no sensitive plant species would be affected by construction of a revetment at the Price Street - North site. The only sensitive animal species that would occur on the bluffs or beach where revetment construction would take place would be the Federal threatened western snowy plover.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Price Street - North site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Price Street - North site. Foraging would be most likely to occur in the high intertidal, which will be affected by revetment construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.39 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Price Street - North site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Price Street - North site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Price Street - North site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The tidepool habitat northwest of the pocket beach at the Price Street-North site and the rocky formations offshore potentially could support black abalone. The footprint of the revetment would not extend into these areas. The rocky habitat affected by the revetment would be isolated low-relief boulders that do not provide suitable habitat for abalone.

Alternative 2: Vertical Sea Wall

The vertical sea wall at the Price Street - North site would extend for an alongshore length of 270 feet and would extend up to + 20 feet MLLW on the bluff face. The footprint on the bluff face would be 0.31 acre, and the footprint on the beach would be 0.22 acre, of which 0.15 acre would be sandy beach and 0.07 acre would be rocky habitat. The sea wall would extend seaward to an elevation of +8 feet MLLW. Approximately 0 acre of the revetment beach footprint would be below MHHW. Beach at this site currently includes 1.38 acres of sandy beach and 0.34 acre of rocky habitat. The footprint of the sea wall would cover 13 percent of the total beach area at this site.

The impacts of the vertical sea wall on bluff vegetation would be similar to the impacts of the revetment. Less than 0.31 acre of arroyo willow scrub and possibly some coastal bluff scrub may be lost. The impacts of the vertical sea wall on bluff vegetation would be insignificant.

Construction of a vertical sea wall at the Price Street – North site would impact 0.15 acre of sandy beach and 0.07 acre of rocky beach habitat above +8 feet, which is above the intertidal zone. Sea water would reach this area only during periods of high tides, large surf, and extreme storm run-up. Therefore, intertidal organisms would not be affected. The presence of the sea wall may have some adverse impact on the adjacent macroinvertebrate community, but the effect would be expected to be less than that of a rock revetment. Birds may sometimes forage on insects in this upper beach area. The loss of 0.15 acre of beach habitat above the intertidal zone would be an insignificant impact. Like the revetment alternative, the vertical sea wall alternative would have no impact on tidepools, kelp, or surfgrass.

The impacts of construction activity for a vertical sea wall at the Price Street - North site would be similar to the impacts described above for a revetment. The vertical sea wall would require seven months to construct compared to five months for a rock revetment, so the disturbance to birds and wildlife of a vertical sea wall would last two months longer than for a revetment; but the impacts still would be insignificant. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

<u>Western Snowy Plover</u>: Would not adversely affect. No snowy plovers nest on the beach at the Price Street - North site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Price Street - North site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.22 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

<u>California Least Tern</u>: no effect. California least tern that may be present offshore the Price Street - North site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Price Street - North site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Price Street - North site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into rocky intertidal habitat.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The footprint of the sculpted concrete/shotcrete wall at the Price Street - North site would be identical to the footprint of the vertical sea wall. Therefore, the permanent impacts to habitats of the sculpted concrete/shotcrete wall would be the same as the vertical sea wall and would be insignificant.

The construction impacts of the sculpted concrete/shotcrete wall at the Price Street - North site would be similar to those of the vertical sea wall and the revetment, with the exception that the duration of construction would be eight months for the sculpted concrete/shotcrete wall compared to seven months for the vertical sea wall and five months for the rock revetment. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Price Street - North site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Price Street - North site. Foraging would be most likely to occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers sometimes forage in kelp wrack in the upper intertidal zone. The loss of up to 0.22 acre of beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by the mitigation measure described for the St. Andrews Lift Station site. With implementation of this mitigation measure, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Price Street - North site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Price Street - North site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Price Street - North site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into rocky intertidal habitat

No Action Alternative

Under the No Action alternative, the bluff at the Price Street - North site would continue to erode. Bluff erosion at this site might result in the loss of some or all of the bluff vegetation. Continued erosion has the potential to result in the construction of emergency revetments or sea walls that would have similar impacts to beach biological resources as the proposed structures.

4.4.2.6 Price Street – South

Alternative 1: Rock Revetment

The rock revetment at the Price Street - South site would extend for an alongshore length of 160 feet and would extend up to + 22 feet MLLW on the bluff face. The footprint on the bluff face would be 0.18 acre and on the beach would be 0.16 acre. Of the 0.16 acre on the beach that the revetment would cover, approximately 0.14 acre would be sandy beach and the remaining 0.02 acre would be rocky habitat. The revetment would extend seaward to just below an elevation of + 5 feet MLLW. Approximately 0.02 acre of the revetment beach footprint would be below + 5 feet MLLW. Beach at this site currently includes 1.53 acres of sandy beach and 0.38 acre of rocky habitat. The revetment would cover 9 percent of the beach area at this site.

The construction of the revetment on the bluffs at the Price Street - South site will permanently impact a small amount of disturbed coastal bluff scrub and central coastal scrub on the bluffs at this site. This central coastal and coastal bluff scrub is vulnerable to erosion as well as wave impact during high surf and tide conditions and may be lost even without revetment construction. The loss of less than 0.18 acre of central coastal scrub and disturbed coastal bluff scrub is an insignificant impact because it would not result in a substantial change beyond normal variability of the plant communities on the bluff.

The bluffs in the vicinity of the Price Street - South site are used for roosting by brown pelicans, western gulls, and cormorants. Peregrine falcons and osprey also use the cliffs in this general area. The construction of a revetment at the Price Street - South site would not be expected to result in a permanent loss of roosting habitat because most of the roosting occurs on the upper

bluffs above the area where the revetment would be constructed. The birds also may use the revetment for roosting.

The construction of the revetment at the Price Street - South site would result in the permanent loss of about 0.14 acre of sandy beach. Most of the sandy beach that would be lost would be above + 5 feet MLLW (based on the September 2009 beach condition). Sandy beach organisms that occupy the high intertidal and splash zones include beach hoppers and insects such as kelp flies that are associated with the macrophyte wrack that tends to accumulate at the high tide line. These organisms provide a food base for birds that forage on the beach. In addition to the actual loss of sandy beach habitat to the revetment footprint, there is some evidence that shoreline structures, especially structures that extend below mean higher high water elevation, result in a degradation of the macroinvertebrate community by changing community composition and reducing species diversity (Sobcinski et al. 2010). Therefore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself.

The high intertidal also provides spawning area for grunion. However, the lack of a substantial sand beach at the Price Street - South site makes it poor grunion spawning habitat. The sand on this beach tends to fluctuate, depending on oceanographic conditions. The loss of a small amount of seasonally-fluctuating sand beach at the Price Street - South site would be insignificant.

Harbor seals haul out on offshore rocks and beaches in the Project area. They haul out on rocks just offshore and may at times haul out on the pocket beach below the Price Street - South site. The revetment construction at this site will replace 0.16 acre of upper beach. However, the revetment will affect a minimal amount of beach below +5 feet MLLW. Therefore, beach will still be available for harbor seals during low tides when they typically haul out, and 91 percent of the total beach area will be outside the revetment footprint. Impacts would be insignificant. Harbor seals also may avoid the beach completely when construction activities are taking place. Temporary avoidance of the beach by harbor seals would be an insignificant impact because numerous other haul-out sites are available in the local area, and the Price Street - South beach has not been identified as an important harbor seal haul-out site. However, if harbor seals are hauled out on the beach during a lull in construction activity, disturbance of those seals by a resumption of work would constitute harassment under the Marine Mammal Protection Act. This impact can be avoided by implementing the harbor seal measure described in the rock revetment alternative for the St. Andrews Lift Station site.

The revetment footprint also would cover 0.02 acre of rocky habitat mostly above + 5 feet MLLW elevation. The rocky intertidal habitat covered by revetment would be primarily in the splash zone. The upper zones are characterized by green algae, barnacles, periwinkle snails, and limpets. The revetment rocks would support a similar assemblage of organisms; therefore, the covering of high intertidal rocks with revetment boulders at the Price Street - South site would be an insignificant impact. Revetment construction would not affect the important aquatic plant species, kelp and surfgrass, which are found in the lower intertidal (0 MLLW and below) and subtidal.

Activity, equipment and workers involved in construction of a revetment at the Price Street - South site would disturb wildlife on the beach and bluffs. About five months would be required to construct the revetment at the Price Street - South site. Birds and mammals that use the beach

and bluffs likely would avoid the immediate area during construction. The birds that roost in the immediate vicinity of the construction site would most likely abandon the site during construction, but would be expected to return when construction is finished. Temporary avoidance by birds and wildlife of a limited amount of coastal bluff and pocket beach habitat would be an insignificant impact.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment and Countermeasures Plan.

Threatened and Endangered Species

La Graciosa Thistle: Would not adversely affect. A slight potential exists that La Graciosa thistle, a federal endangered and State threatened species, could occur in the central coastal scrub habitat that would be within the footprint of the revetment or shotcrete above the revetment at the Price Street – South site. Potential impacts to this sensitive plant species could be reduced to insignificant with the following mitigation measure.

- Prior to construction of the revetment, a survey for La Graciosa thistle should be conducted for central coastal scrub habitat within the footprint of the revetment. If the plant is observed, seeds should be planted in central coastal scrub habitat that will not be disturbed by the construction. With this mitigation measure, the proposed action would not adversely affect the La Graciosa thistle.

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Price Street - South site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Price Street - South site. Foraging would most likely occur in the high intertidal, which will be affected by revetment construction. Snowy plovers forage in kelp wrack in the upper intertidal zone. The loss of up to 0.16 acre of upper beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by implementing the snowy plover measure described in the rock revetment alternative for the St. Andrews Lift Station site. With implementation of the mitigation measure to survey for snowy plovers before construction activities and avoid disturbance to any snowy plovers that may be present, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Price Street - South site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Price Street - South site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Price Street - South site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the revetment would affect a minimal amount of high intertidal, low-relief, isolated boulder/cobble habitat that does not provide suitable habitat for black abalone.

Alternative 2: Vertical Sea Wall

The vertical sea wall at the Price Street - South site would extend for an alongshore length of 160 feet and would extend up to + 20 feet MLLW on the bluff face. The footprint on the bluff face would be 0.18 acre, and the footprint on the beach would be 0.12 acre of which 0.11 acre would be sandy beach and 0.01 acre would be rocky habitat. The sea wall would extend seaward to an elevation of + 6 feet MLLW. Approximately 0 acre of the seawall beach footprint would be below mean higher high water. Beach at this site currently includes 1.53 acres of sandy beach and 0.38 acre of rocky habitat. The sea wall would affect approximately 6 percent of the beach at this site.

The impacts of the vertical sea wall on bluff vegetation would be similar to the impacts of the revetment. The loss of less than 0.18 acre of central coastal scrub and disturbed coastal bluff scrub is an insignificant impact. Construction of a vertical sea wall would not result in a substantial permanent loss of bird roosting habitat because most of the roosting occurs on the upper bluffs above the height at which the wall would be constructed. However, unlike the revetment, which could be used for bird roosting when construction is completed, birds would not be able to roost on the vertical sea wall.

A slight chance exists that central coastal bluff habitat at the Price Street - South site could support the federal endangered and state threatened La Graciosa thistle. Impacts on this sensitive plant species could be reduced to insignificant by implementing the La Graciosa thistle measure described in the rock revetment alternative for Price Street - South. With implementation of this mitigation measure the proposed action would not adversely affect the La Graciosa thistle.

Construction of a vertical sea wall at the Price Street - South site would impact 0.11 acre of sandy beach and 0.01 acre of rocky beach habitat above + 6 feet, which is above all except the highest spring tides. Organisms characteristic of this high intertidal zone include beach hoppers and insects on sandy beaches and green algae, barnacles, periwinkles and limpets on the rocks. Birds may sometimes forage on insects in this upper beach area. The loss of 0.12 acre of beach habitat in the highest intertidal zone would be an insignificant impact. Like the revetment alternative, the vertical sea wall alternative would have no impact on tidepools, kelp, or surfgrass.

The impacts of construction activity for a vertical sea wall at the Price Street - South site would be similar to the impacts described above for a revetment. The birds that roost on the bluffs in the immediate vicinity of the site would be expected to abandon the site during construction but would return when construction is completed. The vertical sea wall would take seven months to construct compared to five months for a rock revetment, so the disturbance to birds and wildlife

of a vertical sea wall would last two months longer than for a revetment, but the impacts would still be insignificant. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

La Graciosa Thistle: Would not adversely affect. There is a slight potential that La Graciosa thistle, a federal endangered and State threatened species, could occur in the central coastal scrub habitat that would be within the footprint of the revetment or the shotcrete above the sea wall at the Price Street – South site. Potential impacts to this sensitive plant species could be reduced to insignificant by following the mitigation measure for La Graciosa thistle described for the rock revetment alternative for Price Street - South.

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Price Street - South site and the Project area, is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Price Street - South site. Foraging would most likely occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers forage in kelp wrack in the upper intertidal zone. The loss of up to 0.12 acre of upper beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be minimized by implementing the snowy plover measure described in the rock revetment alternative for the St. Andrews Lift Station site. With implementation of the mitigation measure to survey for snowy plovers before construction activities and avoid disturbance to any snowy plovers that may be present, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Price Street - South site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Price Street - South site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Price Street - South site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into rocky intertidal habitat.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The footprint of the sculpted concrete/shotcrete wall at the Price Street - South site would be identical to the footprint of the vertical sea wall. Therefore, the permanent impacts to habitats of the sculpted concrete/shotcrete wall would be similar to those of the vertical sea wall and would be insignificant. A small amount of central coastal bluff habitat that could support the federal endangered and State threatened La Graciosa thistle may be within the footprint of the wall. Impacts on this sensitive plant species could be reduced to insignificant by implementing the La Graciosa thistle measure described in the rock revetment alternative for this site. With implementation of this mitigation measure, the proposed action would not adversely affect the La Graciosa thistle.

The construction of the concrete/shotcrete wall would not affect most of the bird roosting habitat, which is mostly higher on the bluffs than the footprint of the wall. Unlike the vertical sea wall that would not support bird roosting, birds may roost on the more irregular face of the sculpted concrete/shotcrete wall when construction is completed.

The construction impacts of the sculpted concrete/shotcrete wall at the Price Street - South site would be similar to those of the vertical sea wall and the revetment, with the exception that the duration of construction would be eight months for the sculpted concrete/shotcrete wall compared to seven months for the vertical sea wall and five months for the rock revetment. The potential to disturb harbor seals, which may be hauled out on the beach, or snowy plovers that may be foraging or resting on the upper beach would be reduced to insignificant by implementing the two measures described in the rock revetment alternative for the St. Andrews Lift Station site.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during construction could result in contamination of ocean waters. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

La Graciosa Thistle: Would not adversely affect. A slight potential exists that La Graciosa thistle, a federal endangered and State threatened species, could occur in the central coastal scrub habitat that would be within the footprint of the revetment or shotcrete above the sea wall. Potential impacts to this sensitive plant species could be reduced to insignificant by following the mitigation measure for La Graciosa thistle described for the rock revetment alternative.

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Price Street - South site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Price Street - South site. Foraging would most likely occur in the high intertidal, which will be affected by sea wall construction. Snowy plovers forage in kelp wrack in the upper intertidal zone. The loss of up to 0.12 acre of upper beach, which may be used occasionally for snowy plover foraging, would be an insignificant impact. Snowy plovers foraging on the beach during a lull in construction activities may be disturbed when activities begin again. Disturbance to snowy plovers can be

minimized by implementing the snowy plover measure described in the rock revetment alternative for the St. Andrews Lift Station site. With implementation of the mitigation measure to survey for snowy plovers before construction activities and avoid disturbance to any snowy plovers that may be present, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Price Street - South site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Price Street - South site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Price Street - South site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. The footprint of the sea wall would not extend into rocky intertidal habitat

No Action Alternative

Under the No Action alternative, the bluff at the Price Street - South site would continue to erode. Bluff erosion at this site might result in the loss of some or all of the bluff vegetation. Continued erosion has the potential to result in the construction of emergency revetments or sea walls that would have similar impacts to beach biological resources as the proposed structures.

4.4.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The rock revetment at the Cypress Street Lift Station site would extend for an alongshore length of 680 feet and would extend up to + 20 feet MLLW on the bluff face. The footprint on the bluff face would be 0.55 acre and on the beach would be 0.69 acre of sandy beach. The revetment would also cover 0.17 acre of disturbed coastal dune scrub. The revetment would extend seaward to an elevation of + 14 feet MLLW. The revetment would cover about 1 percent of the beach area at this site.

The construction of the revetment on the bluffs at the Cypress Street Lift Station site will permanently impact less than 0.55 acre of disturbed coastal bluff scrub dominated by nonnative species, such as hottentot fig. This coastal bluff scrub is vulnerable to erosion, as well as wave impact during high surf and tide conditions and may be lost even without revetment construction. The loss of less than 0.55 acre of disturbed coastal bluff scrub is an insignificant impact because it would not result in a substantial change beyond normal variability of the plant communities on the bluff and because most of the vegetation is nonnative.

Construction of the revetment at this site would also permanently affect 0.17 acre of disturbed dune scrub. The dune scrub habitat at this site is characterized by the native species beach-bur

and California sea-blite and nonnative sea rocket. The habitat is considered disturbed because of over 25 percent cover by nonnative sea rocket and because of the high amount of foot traffic. Even though the dune scrub in this area is disturbed, coastal dune plant communities are considered sensitive. Approximately 0.54 acre of the 0.87 acre footprint of the revetment on sand beach and dunes would be completely covered by sand. In addition to the dune habitat that would be within the footprint of the revetment, about 0.09 acre would be disturbed temporarily by construction equipment. Impacts to disturbed coastal dune scrub would be reduced to insignificant by implementation of the following mitigation measure:

- After construction of the revetment, the buried portion of the revetment and the additional area disturbed by construction equipment, as well as adjacent areas if necessary, shall be revegetated with native dune vegetation.

The footprint of the revetment would cover 0.69 acre of sandy beach. This beach would all be above + 14 feet MLLW. Therefore, the sand beach in the footprint of the revetment would be above the reach of the ocean in all tides except extreme tide and wave surge events. No intertidal sand beach invertebrates would be affected. This upper sand beach supports insects and some bird foraging. Because the beach near the Cypress Street Lift Station site is heavily used by beachgoers, foraging by all birds, except the most human-tolerant species, probably would occur only during the early morning hours. After the revetment is constructed, about 0.54 acre of the footprint would be covered by sand and would support bird and insect use similar to the sand beach before revetment construction. Permanent loss of less than 0.69 acre of sandy upper beach would be an insignificant impact.

Grunion may spawn on the wide sand beach below the Cypress Street Lift Station site. The footprint of the revetment would be well above the highest tides (about 7 feet MLLW) and, therefore, would not be accessible to grunion. Revetment construction at the Cypress Street Lift Station would not affect grunion spawning.

Activity, equipment, and workers involved in construction of a revetment at the Cypress Street Lift Station site would disturb wildlife on the beach and bluffs. However, the Cypress Street Lift Station site is in an area of high human use. Therefore, most birds and wildlife in the area are tolerant of human activity. The impacts of revetment construction at the Cypress Street Lift Station site would be insignificant.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. Because of the distance between the revetment and the ocean, potential contamination of ocean waters from a spill at the Cypress Street Lift Station site is remote but possible during extreme high tide and surf conditions. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Cypress Street Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Cypress Street Lift Station site. Foraging would be most likely to occur in the high intertidal, which will not be affected by revetment construction. Snowy plovers would be unlikely to forage near the revetment on the upper beach because of the lack of intertidal invertebrates and the high amount of human activity. A slight chance exists that snowy plovers could forage on insects or rest on the beach near the revetment construction area in the early morning. Disturbance to snowy plovers can be minimized by implementing the snowy plover measure described in the rock revetment alternative for the St. Andrews Lift Station site. With implementation of the mitigation measure to survey for snowy plovers before construction activities and avoid disturbance to any snowy plovers that may be present, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Cypress Street Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter : no effect. Southern sea otters that may be present offshore the Cypress Street Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Cypress Street Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. There is no rocky habitat to support black abalone at the Cypress Street Lift Station site.

Alternative 4: Steel Sheet Pile Wall

The steel sheet pile wall at the Cypress Street Lift Station site would extend for an alongshore length of 680 feet and would extend up to + 20 feet MLLW on the bluff face. The footprint on the bluff face would be 0.55 acre and on the beach would be 0.15 acre of sandy beach. The sheet pile wall would extend seaward to an elevation of + 18 feet MLLW. No dune habitat would be within the footprint of the steel sheet pile wall. The sheet pile wall would cover about 0.2 percent of the beach area at this site.

The impacts to bluff vegetation from the construction of a steel sheet pile wall at the Cypress Street Lift Station site would be the same as the impacts of the rock revetment. Loss of less than 0.55 acre of disturbed coastal bluff scrub dominated by nonnative plant species would be an insignificant impact.

The revetment would permanently impact 0.15 acre of upper sand beach habitat. Another 0.02 acre of upper sand beach would be impacted temporarily by construction equipment. This upper sand beach is beyond the reach of the ocean during all but the most extreme events. Invertebrates in this area would be limited primarily to insects and birds and wildlife of human-tolerant

species. Almost all of the seawall would be covered by sand, and the use of the sand beach after construction would be similar to the existing condition. Impacts would be insignificant. No dune habitat would be affected by construction of the steel sheet pile wall. Although grunion may spawn on the beach near the Cypress Street Lift Station site, the steel sheet pile wall would be beyond the reach of normal high tides and would not affect grunion spawning.

Activity, equipment and workers during construction of a steel sheet pile wall at the Cypress Street Lift Station site would disturb wildlife on the beach and bluffs; however, the Cypress Street Lift Station site is in an area of high human use. Therefore, most birds and wildlife in the area are tolerant of human activity. The impacts of steel sheet pile wall construction at the Cypress Street Lift Station site would be insignificant.

As discussed above in Section 4.2.2., there is a slight chance that a leak or spill from construction equipment during revetment construction could result in contamination of ocean waters. Because of the distance between the revetment and the ocean, potential contamination of ocean waters from a spill at the Cypress Street Lift Station site is remote but possible during extreme high tide and surf conditions. This impact would be reduced to insignificant through preparation of and adherence to a Spill Prevention, Containment, and Countermeasures Plan.

Threatened and Endangered Species

Western Snowy Plover: Would not adversely affect. No snowy plovers nest on the beach at the Cypress Street Lift Station site, and the Project area is not designated as critical habitat for snowy plovers. Snowy plovers may at times forage on the beach at the Cypress Street Lift Station site. Foraging would be most likely to occur in the high intertidal, which will not be affected by revetment construction. Snowy plovers would be unlikely to forage near the sea wall on the upper beach because of the lack of intertidal invertebrates and the high amount of human activity. A slight chance exists that snowy plovers could forage on insects or rest on the beach near the construction area in the early morning. Disturbance to snowy plovers can be minimized by implementing the snowy plover measure described in the rock revetment alternative for the St. Andrews Lift Station site. With implementation of the mitigation measure to survey for snowy plovers before construction activities and avoid disturbance to any snowy plovers that may be present, the proposed action would not adversely affect snowy plover.

California Least Tern: no effect. California least tern that may be present offshore the Cypress Street Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Southern Sea Otter: no effect. Southern sea otters that may be present offshore the Cypress Street Lift Station site would not lose any habitat from construction of the revetment and are unlikely to be disturbed by construction work on the bluffs and beach.

South-Central California Coast Steelhead: no effect. Steelhead that may be present offshore the Cypress Street Lift Station site would not lose any habitat from construction of the sea wall and are unlikely to be disturbed by construction work on the bluffs and beach.

Black Abalone: no effect. There is no rocky habitat to support black abalone at the Cypress Street Lift Station site.

No Action Alternative

Under the No Action alternative, the bluff at the Cypress Street Lift Station site would continue to erode. Bluff erosion at this site might result in the loss of some or all of the bluff vegetation. Continued erosion has the potential to result in the construction of emergency revetments or sea walls that would have similar impacts to beach biological resources as the proposed structures.

4.4.2.8 Summary of Habitat Impacts

Impacts to Essential Fish Habitat

Impacts of the rock revetment and sea wall alternatives to Essential Fish Habitat at the six sites will be minimal. None of the alternatives will have any impacts on surfgrass, subtidal reefs, or kelp beds. The rock revetment will result in some loss of habitat for surf zone fishes at all of the sites except the Cypress Street Lift Station. The rock revetment alternatives at the other sites will extend to elevations between + 3 feet MLLW at the Ocean Park site to + 5 feet MLLW at Price Street – South site. Therefore, the rock revetment alternatives will result in some loss of habitat used by surf zone fishes during high tides. The amount of habitat below + 5 feet that will be covered by the rock revetment ranges from 0.02 acre at the St. Andrews Lift Station and Price Street - South sites to 0.06 acre at the Ocean Park site. The sea wall alternatives will not extend below the mean high tide line and would not be expected to have any impact on fishes.

None of the alternatives are expected to affect grunion spawning. The beaches at the five northern sites are cobble pocket beaches that are unlikely to support grunion spawning. The rock revetment or sea wall at the Cypress Street Lift Station site would be constructed above the reach of all but the most extreme storm surge and high tide events.

Summary of Impacts to Species Covered Under the Endangered Species Act

The only listed species with potential to occur at or near any of the Project sites are the La Graciosa thistle, the western snowy plover, the California least tern, and the south-central California coast steelhead. Impacts to each of these species are summarized below.

La Graciosa Thistle (*Cirsium loncholepis*) Federal Endangered, State Threatened. – This species was not observed at any site; however, because of lack of access, the Price Street - South site could not be completely surveyed. Therefore, the following mitigation measure should be implemented at the Price Street - South site.

- Prior to construction of the revetment, a survey for La Graciosa thistle should be conducted for central coastal scrub habitat within the footprint of the revetment. If the plant is observed, seeds should be planted in central coastal scrub habitat that will not be disturbed by the construction. With this mitigation measure the proposed action would not adversely affect the La Graciosa thistle.

Western Snowy Plover (*Charadrius alexandrinus nivosus)* – Federal Threatened – The western snowy plover does not breed on any of the Project sites, and none of the sites has been designated as critical habitat for snowy plovers. However, snowy plovers could forage at times on the beach at any of the Project sites. The loss of a small amount of potential foraging habitat by construction of a bluff protection structure would not adversely affect snowy plovers; however, snowy plovers could be disturbed by Project construction. With implementation of the following mitigation measure, the proposed action would not adversely affect snowy plovers.

- A biological monitor shall be present during any construction activities on the site during the first week. If snowy plovers are observed near the construction area, the monitor will advise the work crews on how to avoid or minimize impacts to plover, which may include temporarily halting activities, until the plovers have left the site. Minimization measures shall continue throughout site construction

South-Central California Coast Steelhead (*Oncorhynchus mykiss irideus*) – Federal Threatened – Construction of a bluff protection structure would not affect steelhead that may be present in nearshore waters of the Project area.

California Least Tern (*Sterna antillarum browni*) – Federal and State Endangered – Construction of a bluff protection structure would not affect least terns that may be present in nearshore waters of the Project area.

Southern Sea Otter *(Enhydra lutris nereis)* - Federal Threatened – Construction of a bluff protection structure would not affect sea otters that may be present in nearshore waters of the Project area.

Black Abalone (*Haliotis cracherodii*) – Federal Endangered – Construction of a bluff protection structure would not affect black abalone habitat and would not affect black abalone.

Table 4-24 summarizes the habitat areas that would be within the footprint of each alternative at each site.

Table 4-24:
Habitat Loss for Each Alternative at Each Site

Site	Alternative	Habitat Losses (acres)				
		Bluff Face	Total Beach	Total Rocky	Intertidal Beach	Intertidal Rocky
St Andrews Lift Station	1	0.09	0.18	0.09	0.02	0.01
	2	0.09	0.06	0.03	0	0
	3	0.09	0.06	0.03	0	0
Vista del Mar Lift Station	1	0.04	0.17	0	0.04	0
	2	0.04	0.06	0	0	0
	3	0.04	0.06	0	0	0
Ocean Park	1	0.07	0.20	0.06	0.06	0.02
	2	0.07	0.08	0.04	0	0
	3	0.07	0.08	0.04	0	0
Price Street - North	1	0.31	0.39	0.16	0.03	0.01
	2	0.31	0.22	0.07	0	0
	3	0.31	0.22	0.07	0	0
Price Street - South	1	0.18	0.16	0.02	0.02	0.003
	2	0.18	0.12	0.01	0.01	0.001
	3	0.18	0.12	0.01	0.01	0.001
Cypress Street Lift Station	1	0.55	0.87	0	0	0
	4	0.55	0.15	0	0	0

4.5 CULTURAL

4.5.1 Environmental Setting

4.5.1.1 Introduction

Prehistorically, the Pismo Beach area was inhabited by the Chumash. Various Chumash groups inhabited a territory from San Luis Obispo in the north to Mailbu in the south (Grant 1978). Eight different subgroups have been identified, of which the Obispeno would have occupied the present Project area. The Chumash were missionized between 1771 and 1834, which had a devastating effect on their population and native culture.

The Chumash and/or other Native American tribes would have occupied the area as long ago as 9,000 years before the present.

Culturally, Obispeno Chumash were generally a coastal dwelling people who exploited marine resources for subsistence and other material culture needs (Greenwood 1978). Although they used balsa and plank canoes, most of the marine food sources were obtained near shore, rather than deep water fishing.

4.5.1.2 Record and Literature Search/Field Survey

A records and literature search was conducted through the Central Coast Information Center (CCIC) at the University of California, Santa Barbara. This facility is part of the California Historical Resources Information System (CHRIS), which is a statewide system for managing information on prehistoric and historical resources identified in California. It is authorized and directed by the State Office of Historic Preservation (OHP) with twelve regional Information Centers. In-house USACE documents were also reviewed.

The information available at the Information Centers consists of hardcopy of both current and historic records and maps. The main body of the information is in individual site record forms, copies of archeological and historical survey reports, and copies of historic maps. Using this information, the location and description of known historic and prehistoric resources can be determined. It also is possible to determine if a field survey has been conducted on a particular piece of property. An analysis of this information makes it possible to evaluate the potential for resources to be located in areas that have not yet been surveyed. The information also is useful in planning for future studies of an area.

The CCIC conducted a records search for all previously recorded cultural resources sites and surveys within a one-quarter mile radius around each location's area of potential effects (APE). In addition the CCIC did a search of the following inventories:

- State Historic Property Files
- National Register of Historic Places
- National Register of Determined Eligible Properties
- California Historical Landmarks
- California Points of Historical Interest
- California OHP Archaeological Determinations of Eligibility
- Caltrans State and Local Bridge surveys.

The result of this search indicates that there are 13 archaeological sites and 106 previous cultural resources surveys within a one-quarter mile radius of each Project location (Table 4-25).

Table 4-25:
Previous Cultural Resources within a One-Quarter Mile Radius of Each Location

Site Designation	Description	Located Near
CA-SLO-80	Prehistoric Habitation Site	Price Street - South
CA-SLO-87	Prehistoric Burial Site	Cypress Street Lift Station
CA-SLO-98	Prehistoric Shell Midden	Price Street – North Ocean Park
CA-SLO-99	Prehistoric Shell Midden	Price Street - South Price Street - North
CA-SLO-459	Prehistoric Habitation Site/Shell Midden	Ocean Park
CA-SLO-768	Prehistoric Shell Midden	St. Andrews Lift Station
CA-SLO-832	Prehistoric Habitation Site	Cypress Street Lift Station
CA-SLO-890	Prehistoric Habitation Site/Historical Component	Cypress Street Lift Station
CA-SLO-1343	Prehistoric Shell Midden	Price Street - South
CA-SLO-1344	Prehistoric Shell Midden	Price Street - North
CA-SLO-1350	Prehistoric Shell Midden	Price Street - South
CA-SLO-2542	Harty's Shell Court - Historical Structure	Cypress Street Lift Station
CA-SLO-2543	Shell Cafe - Historical Structure	Cypress Street Lift Station

St. Andrews Lift Station

Five previous cultural resources surveys have been recorded within one-quarter mile. None of them covered the present area of proposed shore protection.

The records search does indicate the presence of one prehistoric archeological site, CA-SLO-768 within one-quarter mile. It was described by W. Sawyer in 1976 as a heavily disturbed, sparse scatter of shell and artifacts. However, this site is located outside the APE for any proposed shore protection.

A field survey of the APE was conducted by USACE archeological staff in 2009/10 for this location. No archeological or historical sites were observed.

Vista del Mar Lift Station

Twenty-five previous cultural resources surveys have been recorded within one-quarter mile. None of them covered the present area of proposed shore protection.

The records search does not indicate the presence of any prehistoric archeological or historical sites within this same area.

A field survey of the APE was conducted by USACE archeological staff in 2009/10 for this location. No archeological or historical sites were observed.

Ocean Park

Sixty-three previous cultural resources surveys have been recorded within one-quarter mile. None of them covered the present area of proposed shore protection.

The records search does indicate the presence of two prehistoric archeological sites, CA-SLO-98 and CA-SLO-459 within one-quarter mile. Site CA-SLO-98 is located outside the APE for any proposed shore protection.

Site CA-SLO-459 is located within the horizontal extent of the proposed APE; however, it is located above where shore protection is likely to be constructed.

One historic resource was noted by the records search at 374 Capistrano. The search does not describe the resource, although it was probably an historical structure. This resource is no longer present. This site is located outside the APE for any proposed shore protection.

A field survey of the APE was conducted by USACE archeological staff in 2009/10 for this location. Evidence of prehistoric site CA-SLO-459 was observed near the Project area. It is possible that this small area could be avoided during construction and not be affected. This is consistent with a site record form prepared for an unrelated project nearby to the north.

Price Street - North

Five previous cultural resources surveys have been recorded within one-quarter mile. One of them covered the present area of proposed shore protection. This survey was conducted in 1980 by Jack Zahniser. The results were negative for the present Project area.

The records search does indicate the presence of four prehistoric archeological sites, CA-SLO-98, CA-SLO-99, CA-SLO-890, and CA-SLO-1344 within one-quarter mile. They were described as prehistoric shell middens consisting of shell and artifacts. One of these sites also contained an historical component. However, these sites are located outside the APE for any proposed shore protection.

A field survey of the APE was conducted by USACE archeological staff in 2009/10 for this location. No archeological or historical sites were observed.

Price Street - South

Nine previous cultural resources surveys have been recorded within one-quarter mile. None of them covered the present area of proposed shore protection.

The records search does indicate the presence of four prehistoric archeological sites, CA-SLO-80, CA-SLO-99, CA-SLO-1343, and CA-SLO-1350 within one-quarter mile. They were described as prehistoric shell middens consisting of shell and artifacts. However, these sites are located outside the APE for any proposed shore protection.

A field survey of the APE was conducted by USACE archeological staff in 2009/10 for this location. No archeological or historical sites were observed.

Cypress Street Lift Station

Sixteen previous cultural resources surveys have been recorded within one-quarter mile of the APE. None of them covered the present area of proposed shore protection at this location. One of these surveys was very close to the Project area. This particular negative survey was for a garage demolition project at the northwest corner lot at Harloe and Cypress Streets (Dills 1993).

The records search does indicate the presence of four cultural resources sites, CA-SLO-87, CA-SLO-832, CA-SLO-2542, and CA-SLO-2543 within one-quarter mile. The latter two are historic buildings. CA-SLO-87 is described as "Schumacher's Graves" and CA-SLO-832 is described as a prehistoric habitation site. However, these sites are located outside the APE for any proposed shore protection.

A field survey of the APE was conducted by USACE archeological staff in 2009/10 for this location. No archeological or historical sites were observed.

4.5.1.3 Recommendations

Numerous known prehistoric archeological sites are located along the coast in the Pismo Beach area. It is highly likely that others may be uncovered by Project construction activities. The locations of these resources are on the bluffs above the areas to be proposed for shore protection. Project design should attempt to design alternatives that avoid impacting these areas.

4.5.1.4 Native American Concerns

USACE requested a Sacred Lands File search and a Native American Contacts List from the California Native American Heritage Commission (NAHC). Their records indicate the presence of several Native American cultural resources in the general areas of the six Project sites. The NAHC did not reveal any locational details. The NAHC also provided a list of federally recognized and non-federally recognized groups and individuals. These contacts were contacted to provide their comments and concerns on the Project. One letter of general concern with the sensitivity of the project areas was received by Mona Tucker of the Yak Tityu Tityu group.

4.5.2 Environmental Consequences

4.5.2.1 Significance Criteria

The Project would have a significant effect on cultural resources if it will disturb, remove from original context, or introduce incompatible elements out of character with any property considered eligible for the National Register of Historic Places (NRHP). Project construction will be monitored by an archeologist meeting the "Secretary of the Interior's Qualification Standards."

4.5.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

No cultural resources are present at this location. Therefore, none would be affected by this alternative. If cultural resources are discovered prior to or during work and cannot be avoided, work will be suspended in that area until resources are evaluated for eligibility for listing in the NRHP after consultation with the State Historic Preservation Office (SHPO). If resources are deemed eligible for the NRHP, the effects of the Project will be taken into consideration in consultation with the SHPO. The Advisory Council on Historic Preservation (ACHP) will be provided an opportunity to comment in accordance with 36 CFR 800.13.

Alternative 2: Vertical Sea Wall

No cultural resources are present at this location. Therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

No cultural resources are present at this location. Therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

No Action Alternative

No known resources are anticipated to be affected by continued erosion at this location. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

4.5.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

No cultural resources are present at this location. Therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 2: Vertical Sea Wall

No cultural resources are present at this location. Therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

No cultural resources are present at this location. Therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

No Action Alternative

No known resources are anticipated to be affected by continued erosion at this location.

4.5.2.4 Ocean Park

Alternative 1: Rock Revetment

Portions of one prehistoric site, CA-SLO-459, are located very close to activities that would be required to construct this alternative; however, with appropriate construction restrictions and archeological monitoring, no effects would occur to this site. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 2: Vertical Sea Wall

Portions of one prehistoric site, CA-SLO-459, are located very close to activities that would be required to construct this alternative; however, with appropriate construction restrictions and archeological monitoring, no effects would occur to this site. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

Portions of one prehistoric site, CA-SLO-459, are located very close to activities that would be required to construct this alternative; however, with appropriate construction restrictions and archeological monitoring, no effects would occur to this site. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

No Action Alternative

It is possible that over time, site CA-SLO 459 would be affected by continued erosion at this location.

4.5.2.5 Price Street – North

Alternative 1: Rock Revetment

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 2: Vertical Sea Wall

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

No Action Alternative

No known resources are anticipated to be affected by continued erosion at this location.

4.5.2.6 Price Street – South

Alternative 1: Rock Revetment

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 2: Vertical Sea Wall

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 3: Sculpted Concrete/Shotcrete Wall

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

No Action Alternative

No known resources are anticipated to be affected by continued erosion at this location.

4.5.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

Alternative 4: Steel Sheet Pile Wall

No cultural resources are present at this location; therefore, none would be affected by this alternative. The cultural resources discovery measure described in the rock revetment alternative for the St. Andrews Lift Station site would be applied to this alternative.

No Action Alternative

No known resources are anticipated to be affected by continued erosion at this location.

4.6 SOCIOECONOMIC ENVIRONMENT

4.6.1 Environmental Setting

The Project area is within the City of Pismo Beach and includes sites in Shell Beach, which is a community within the City of Pismo Beach. The 2000 population of Pismo Beach (including Shell Beach) was 8,551, an increase of 11.1 percent from the 1990 population of 7,699 (U.S. Census Bureau 2009).

Table 4-26 and Table 4-27 show Pismo Beach income and population data from the 2000 census.

4.6.2 Environmental Consequences

4.6.2.1 Significance Criteria

An impact to socioeconomics/environmental justice would be considered significant if the project would:

- adversely contribute to cumulative population growth that would exceed regional or local population projections;
- adversely induce substantial growth either directly or indirectly;
- displace existing housing or cause a substantial increased demand for housing through population growth; and/or
- result in disproportionately high and adverse impacts on minorities, low-income residence
- result in substantial economic loss associated with damage and/or devaluation of coastal properties.

Table 4-26: Racial and Ethnic Composition – 2000

Racial Group	Pismo Beach		San Luis Obispo County		California	
	Number	Percent	Number	Percent	Number	Percent
White	7,811	91.3	208,699	84.60	20,170,059	59.55
Black or African-American	51	0.6	5,002	2.03	2,263,882	6.68
American Indian and Alaska Native	61	0.7	2,335	0.95	333,346	0.98
Asian	250	2.9	6,568	2.66	3,697,513	10.92
Native Hawaiian and Other Pacific Islander	5	0.1	286	0.12	116,961	0.35
Other Race	141	1.6	15,312	6.21	5,682,241	16.78
Two or more races	232	2.7	8,479	3.44	1,607,646	4.75
Hispanic or Latino (of any race)	589	6.9	40,196	16.29	10,966,556	32.38

Table 4-27: Economic Characteristics – 2000

Economic Characteristic	Pismo Beach		San Luis Obispo County		California	
	Number	Percent	Number	Percent	Number	Percent
Median Household Income in 1999 (dollars)	46,396	NA	42,428	N/A	47,493	N/A
Median Family Income in 1999 (dollars)	61,036	N/A	52,447	N/A	53,025	N/A
Per Capita Income in 1999 (dollars)	30,835	N/A	21,864	N/A	22,711	N/A
Families below poverty level	148	6.3	3,991	6.8	845,991	10.6
Individuals below Poverty Level	768	9.0	29,775	12.8	4,706,130	14.2

4.6.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

Construction of a rock revetment at the St. Andrews Lift Station site would protect a small amount (110 linear feet) of critically eroding coastal bluffs within a developed area. This limited amount of bluff protection would not lead to increased development and, thus, would not induce population growth. Construction at the toe of the bluffs would not displace any existing housing or cause economic loss associated with damage or devaluation of coastal properties. In fact, bluff protection at the St. Andrews Lift Station site would help to protect housing and the potential loss of infrastructure.

As shown in Table 4-26 and Table 4-27, the population of Pismo Beach is predominantly Caucasian with a median per capita income above that of San Luis Obispo County and the State of California (according to the 2000 census). Only 6.3 percent of the families and 9 percent of the individuals in Pismo Beach are below the poverty level. Therefore, revetment construction would not have disproportionately high and adverse impacts on minorities or low income residences. Construction of a rock revetment would have an insignificant impact on socioeconomics.

Alternative 2: Vertical Sea Wall

The impacts to socioeconomics of construction of a vertical sea wall at the St. Andrews Lift Station site would be the same as those of rock revetment construction. Toe protection of 110 linear feet of coastal bluff would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a vertical sea wall would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to socioeconomics of construction of a sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be identical to those of rock revetment and vertical sea wall construction and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the St. Andrews Lift Station site would continue to erode. It is expected that economic loss associated with the loss of infrastructure would occur. Property near the bluffs in this area would be devalued because of the threat of erosion damage.

4.6.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

The impacts to socioeconomics of a rock revetment at the Vista del Mar Lift Station site would be the same as for construction of a rock revetment at the St. Andrews Lift Station site. Toe protection of 120 linear feet of eroding coastal bluffs would not induce growth, displace existing

housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a rock revetment to socioeconomics would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to socioeconomics of construction of a vertical sea wall at the Vista del Mar Lift Station site would be the same as those of rock revetment construction. Toe protection of 120 linear feet of coastal bluff would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a vertical sea wall would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to socioeconomics of construction of a sculpted concrete/shotcrete wall at the Vista del Mar Lift Station site would be identical to those of rock revetment and vertical sea wall construction and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Vista del Mar Lift Station site would continue to erode. It is expected that economic loss associated with the loss of infrastructure would occur. Property near the bluffs in this area would be devalued because of the threat of erosion damage.

4.6.2.4 Ocean Park

Alternative 1: Rock Revetment

The impacts to socioeconomics of a rock revetment at the Ocean Park site would be the same as for construction of a rock revetment at the St. Andrews Lift Station site. Toe protection of 150 linear feet of eroding coastal bluffs would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a rock revetment to socioeconomics would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to socioeconomics of construction of a vertical sea wall at the Ocean Park site would be the same as those of rock revetment construction. Toe protection of 150 linear feet of coastal bluff would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a vertical sea wall would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to socioeconomics of construction of a sculpted concrete/shotcrete wall at the Ocean Park site would be identical to those of rock revetment and vertical sea wall construction and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Ocean Park site would continue to erode. It is expected that economic loss associated with the loss of infrastructure would occur. Property near the bluffs in this area would be devalued because of the threat of erosion damage.

4.6.2.5 Price Street – North

Alternative 1: Rock Revetment

The impacts to socioeconomics of a rock revetment at the Price Street - North site would be the same as for construction of a rock revetment at the St. Andrews Lift Station site. Toe protection of 270 linear feet of eroding coastal bluffs would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a rock revetment would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to socioeconomics of construction of a vertical sea wall at the Price Street - North site would be the same as those of rock revetment construction. Toe protection of 270 linear feet of coastal bluff would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a vertical sea wall would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to socioeconomics of construction of a sculpted concrete/shotcrete wall at the Price Street - North site would be identical to those of rock revetment and vertical sea wall construction and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Price Street - North site would continue to erode. It is expected that economic loss associated with the loss of infrastructure would occur, particularly if Price Street, a major access route, were damaged. Property near the bluffs in this area would be devalued because of the threat of erosion damage.

4.6.2.6 Price Street – South

Alternative 1: Rock Revetment

The impacts of a rock revetment at the Price Street - South site would be the same as for construction of a rock revetment at the St. Andrews Lift Station site. Toe protection of 160 linear feet of eroding coastal bluffs would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a rock revetment would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts to socioeconomics of construction of a vertical sea wall at the Price Street - South site would be the same as those of rock revetment construction. Toe protection of 160 linear feet of coastal bluff would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. The impacts of a vertical sea wall would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to socioeconomics of construction of a sculpted concrete/shotcrete wall at the Price Street - South site would be identical to those of rock revetment and vertical sea wall construction and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Price Street - South site would continue to erode. It is expected that economic loss associated with the loss of infrastructure would occur, particularly if Price Street, a major access route, were damaged. Property near the bluffs in this area would be devalued because of the threat of erosion damage.

4.6.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The impacts to socioeconomics of a rock revetment at the Cypress Street Lift Station site would be the same as for construction of a rock revetment at the St. Andrews Lift Station site. Toe protection of 680 linear feet of eroding coastal bluffs would not induce growth, displace existing housing, cause economic loss of coastal properties, or disproportionately impact minorities or low income people. Although the 680 linear feet of revetment that would be constructed at the Cypress Street Lift Station site is greater than at the five other sites, the area around Cypress Street Lift Station is fully developed. Therefore, bluff protection would not result in new development. The impacts of a rock revetment to socioeconomics would be insignificant.

Alternative 4: Steel Sheet Pile Wall

The impacts to socioeconomics of a steel sheet pile wall at Cypress Street Lift Station would be identical to those of a rock revetment. The impacts would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Cypress Street Lift Station site would continue to erode. It is expected that economic loss associated with the loss of infrastructure would occur. Property near the bluffs in this area would be devalued because of the threat of erosion damage.

4.7 RECREATION

4.7.1 Environmental Setting

The shoreline in the Project area provides a variety of recreational opportunities. Along the top of the bluffs are trails, parks, and viewing areas for walking, picnicking, photography, and bird and wildlife watching. A walking trail with ocean views follows along most of the bluff top in the Project area. At a few points, access is broken by private houses on the bluffs. The sandy beach at the southern end of the Project area provides opportunities for sunbathing, picnicking, surf fishing, walking, beachcombing, jogging, and beach volleyball. Beach access is more limited in the northern portion of the Project area, but various beach access points provide opportunities for tide pooling and surf fishing. Nearshore waters are used for swimming, surfing, diving, kayaking, boating, fishing, and whale and bird watching. Parks, trails, and beach access at each of the Project sites are identified below.

St. Andrews Lift Station – The St. Andrews Lift Station site is near Memory Park. Memory Park is a one-half acre bluff-top park with picnic tables, a barbeque, and benches. The beach area consists of a pocket beach with tidepools at each end.

Vista del Mar Lift Station – A trail runs along the top of the bluffs at this site, and the beach can be accessed via stairs. The beach is a sandy pocket beach with tidepools.

Ocean Park – The Ocean Park site is adjacent to Ocean Boulevard at a concrete wall that drops to a cobble beach below. A trail runs along the bluffs and has a bench for ocean viewing. The site is just downcoast from Eldwayen Ocean Park. Eldwayen Ocean Park is a 1.5- mile long ocean front park with grass, picnic areas, and beach access. The beach near the site has tidepools.

Price Street - North – This site is adjacent to a sandy beach and near the Best Western Shelter Cove Hotel. Beach access is available via a path from the hotel. The hotel also has a gazebo outlook. The beach provides opportunities for sun bathing, picnicking, and surf fishing. A trail runs along the bluffs. Immediately upcoast of this site is the 11-acre Dinosaur Caves Park. The park has parking, restrooms, a child's play area, trails, overlooks, and picnic tables.

Price Street - South – This site is on a steep bluff face with no beach access. There is off street parking associated with a restaurant and the Best Western Shorecliff Hotel near the site. Bluff top tennis courts also are near the site. A trail along the edge of the bluffs provides opportunities for Walking, photography, and wildlife viewing in this area. Pelicans and other seabirds roost on the bluffs and offshore rocks, and harbor seals haul out on offshore rocks.

Cypress Street Lift Station – The Project site is located at the end of a short segment of bluff trail that terminates at the lift station. A wide, sandy beach is located below the bluffs. This beach is easily accessed via stairs at Wadsworth Street. Street. Parking for beachgoers is available along Wadsworth and Cypress streets. The beach is used for sunbathing, picnicking, surf fishing, walking, jogging, beachcombing, and volleyball. Nearshore ocean waters provide opportunities for surfing, kayaking, and swimming.

4.7.2 Environmental Consequences

4.7.2.1 Significance Criteria

Impacts will be considered significant if the Project results in a permanent loss of existing recreational uses.

4.7.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

The primary recreational amenity at the St. Andrews Lift Station site is Memory Park, which has benches, picnic tables, and views of the ocean. During the three months of revetment construction, heavy equipment, including a crane, will be working on and below the bluff tops. The staging area likely will extend into part of Memory Park. During construction, therefore, recreational use of Memory Park will be less pleasant. Park users may be disturbed by the noise, activity, and sight of the construction. When the revetment construction is finished, use of Memory Park would return to existing conditions.

The revetment would extend to + 4 MLLW. Therefore, after revetment construction, a portion of the beach would not be accessible for beach users during most high tides. Approximately 19 percent of the beach would be covered by the revetment. The loss of beach to the revetment footprint would be 0.18 acre. Under existing conditions, there is little beach at this site and the beach is not easy to access. The beach can be reached by climbing down rubble on the bluffs. The rock revetment would limit beach use more than the existing condition, but would not result in a loss of beach use. Therefore, the impacts of the revetment on beach use would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction of a vertical sea wall at the St. Andrews Lift Station site would be similar to those of construction of a rock revetment. The primary impact to recreation during construction would be a potential loss of some of Memory Park for staging and a less pleasurable experience by park goers because of the noise and sight of construction equipment. These construction impacts would occur for four months for a vertical sea wall compared to three months for a rock revetment.

After construction is completed, the sea wall would result in the loss of a small amount of beach. The sea wall would extend to + 8 feet MLLW, which is above the high tide line. Therefore, except under extreme high tide and surf conditions, the beach would be available for beach users. The footprint of the vertical sea wall on the beach would be 0.06 acre. However, the sea wall would replace most, if not all, of the existing rubble that can be used to access the beach. Therefore, after construction of the sea wall, the beach at this site will be inaccessible, except by walking around from adjacent beaches at low tide. Because the existing rubble is not designed for beach access, and its use may be unsafe, its loss is not considered a substantial loss of recreational beach use. The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to recreation of a sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be the same as for a vertical sea wall; however, construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The impacts to recreation at the St. Andrews Lift Station site would be insignificant.

No Action Alternative

The No Action alternative would avoid the temporary disturbance to people using Memory Park during construction of a rock revetment or seawall. However, if no action is taken to limit bluff erosion at this site, all or some of Memory Park may be lost; and the eroding bluff may pose a hazard to park users. The eroding bluff also may result in the deposition of debris that might interfere with use of the beach. Under the No Action alternative, emergency revetments or sea walls may be constructed at this site that would result in a loss of beach area for recreational beach goers.

4.7.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

Recreational amenities at the Vista del Mar Lift Station site include a bluff-top trail and a stairway leading down to a pocket beach with tidepools. During construction, the bluff top at the Vista del Mar Lift Station site will be used for staging, rock deliveries, and positioning the crane. Construction will likely prevent bluff-top access at this site during the three-month construction period. Use of the bluff trail would be interrupted or diverted at this location. In addition, beach goers would be prevented from using the beach at the site during revetment construction. Temporary interference with recreational use of the bluff top and beach at this site would be an insignificant impact. Beach and bluff-top use would return to existing conditions when revetment construction is completed. The revetment would not displace the existing stairway to the beach.

The revetment would extend to + 4 MLLW. Therefore, after revetment construction, a portion of the beach would not be accessible for beach users during most high tides. The loss of beach to the revetment footprint would be 0.17 acre, which is only 6 percent of the available beach. Under existing conditions, limited beach is available during high tides. After construction of the rock revetment, all of the beach would still be accessible during low tides. The rock revetment would limit beach use slightly more than the existing condition but would not result in a loss of beach use. Therefore, the impacts of the revetment on beach use would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction of a vertical sea wall at the Vista del Mar Lift Station site would be similar to those of construction of a rock revetment. Bluff trail and beach access would be restricted during construction. Construction of the vertical sea wall would take four months compared to three months for revetment construction. Because the impedance to recreational use would be temporary, the impacts of vertical sea wall construction on recreation would be insignificant

After construction is completed, the only impact the sea wall would have on recreation is loss of a small amount of beach. The sea wall would extend to + 8 feet MLLW, which is above the high tide line; therefore, except under extreme high tide and surf conditions, the beach would be available for beach users. The footprint of the vertical sea wall on the beach would be 0.06 acre, which is 2 percent of the available beach. The existing stairway to the beach at this site would be maintained. The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to recreation of a sculpted concrete/shotcrete wall at the Vista del Mar Lift Station site would be the same as for a vertical sea wall; however, construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The impacts to recreation at the Vista del Mar Lift Station site would be insignificant.

No Action Alternative

The No Action alternative would avoid the temporary impacts to recreational use of the bluffs or beach during construction of a rock revetment or seawall; however, if no action is taken to limit bluff erosion at this site, all or some of bluff trail may be lost, and the eroding bluff may pose a hazard to trail users. The stairs that provide access to the beach at this site likely would be lost to erosion. The eroding bluff also may result in the deposition of debris that might interfere with use of the beach. Under the No Action alternative, emergency revetments or sea walls may be constructed at this site that would result in a loss of beach area for recreational beach goers.

4.7.2.4 Ocean Park

Alternative 1: Rock Revetment

Recreational amenities at the Ocean Park site include a bluff-top trail with benches for viewing the ocean and shore. During construction, the bluff top at the Ocean Park site will be used for staging, rock deliveries, and positioning the crane. Construction likely will prevent bluff-top access at this site during the three-month construction period. Use of the bluff trail would be interrupted or diverted at this location. Temporary interference with recreational use of the bluff top at this site would be an insignificant impact. Bluff top use would return to existing conditions when revetment construction is completed.

The revetment would extend to +3 feet MLLW, which is about mean sea level; therefore, after revetment construction, a portion of the beach would not be accessible for beach users about half the time. The loss of beach to the revetment footprint would be 0.20 acre, which is 51 percent of the existing beach. Under existing conditions, this site has no beach access except from adjacent beaches during extreme low tides. Therefore, the impacts of the revetment on beach use would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction of a vertical sea wall at the Ocean Park site would be similar to those of construction of a rock revetment. Bluff trail access would be restricted during construction. Construction of the vertical sea wall would take four months compared to three

months for revetment construction. Because the impedance to recreational use would be temporary, the impacts of vertical sea wall construction on recreation would be insignificant.

After construction is completed, the only impact the sea wall would have on recreation is loss of a small amount of beach. The sea wall would extend to + 8 feet MLLW, which is above the high tide line; therefore, except under extreme high tide and surf conditions, beach would be available for beach users. The footprint of the vertical sea wall on the beach would be 0.08 acre; however, the site currently has no beach access. The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to recreation of a sculpted concrete/shotcrete wall at the Ocean Park site would be the same as for a vertical sea wall; however, construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The impacts to recreation at the Ocean Park site would be insignificant.

No Action Alternative

The No Action alternative would avoid the temporary impacts to recreational use of the bluffs during construction of a rock revetment or seawall; however, if no action is taken to limit bluff erosion at this site, all or some of the bluff trail may be lost, and the eroding bluff may pose a hazard to trail users. The eroding bluff also may result in the deposition of debris that might interfere with use of the beach. Under the No Action alternative, emergency revetments or sea walls may be constructed at this site that would result in a loss of beach area; however, currently this site has no beach access.

4.7.2.5 Price Street – North

Alternative 1: Rock Revetment

A trail runs along the bluff top at the Price Street - North site. Beach access is via a trail from the Best Western Shelter Cove Hotel. The trail is not near the site and would not be affected directly by revetment construction. During construction, a large portion of the bluff top at the site will be used for staging, rock deliveries, and the crane. Construction likely will prevent bluff-top access at this site during the five-month construction period. Use of the bluff trail would be interrupted or diverted at this location. During construction, the construction area near the beach also would be unavailable for recreation. Temporary interference with recreational use of the bluff top and beach at this site would be an insignificant impact. Bluff top use would return to existing conditions when revetment construction is completed.

The revetment would extend to + 4 feet MLLW; therefore, after revetment construction, a portion of the beach would not be accessible for beach users during high tides. The loss of beach to the revetment footprint would be 0.39 acre, which is 23 percent of the beach at this site. The rock revetment would limit beach use more than the existing condition but would not result in a loss of beach use. Therefore, the impacts of the revetment on beach use would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction of a vertical sea wall at the Price Street - North site would be similar to those of construction of a rock revetment. Bluff trail access and beach access would be restricted during construction. Construction of the vertical sea wall would take seven months compared to five months for revetment construction. Because the impedance to recreational use would be temporary, the impacts of vertical sea wall construction on recreation would be insignificant.

After construction is completed, the only impact the sea wall would have on recreation is loss of a small amount of beach. The sea wall would extend to + 8 feet MLLW, which is above the high tide line. The footprint of the vertical sea wall on the beach would be 0.22 acre, which is 13 percent of the beach area at this site. The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to recreation of a sculpted concrete/shotcrete wall at the Price Street - North site would be the same as for a vertical sea wall; however, construction of the sculpted concrete/shotcrete wall would take eight months compared to seven months for the vertical sea wall. The impacts to recreation at the Price Street - North site would be insignificant.

No Action Alternative

The No Action alternative would avoid the temporary impacts to recreational use of the bluffs during construction of a rock revetment or seawall; however, if no action is taken to limit bluff erosion at this site, all or some of the bluff trail may be lost, and the eroding bluff may pose a hazard to trail users. The eroding bluff also may result in the deposition of debris that might interfere with use of the beach. Under the No Action alternative, emergency revetments or sea walls may be constructed at this site that would result in a loss of beach area for recreational beach goers.

4.7.2.6 Price Street – South

Alternative 1: Rock Revetment

Recreational amenities at the Price Street - South site include a bluff-top trail and tennis courts. The site has no beach access except from adjacent beaches during extreme low tides. During construction, a large portion of the bluff top at this site will be used for staging, rock deliveries and the crane. Construction likely will prevent bluff-top access at this site during the five-month construction period. Use of the bluff trail would be interrupted or diverted at this location. Construction activities would not affect the tennis courts. Temporary interference with recreational use of the bluff top at this site would be an insignificant impact. Bluff top use would return to existing conditions when revetment construction is completed.

The revetment would extend to + 5 feet MLLW; therefore, after revetment construction, a portion of the beach would not be accessible for beach users during high tides. The loss of beach to the revetment footprint would be 0.16 acre, which is 9 percent of the beach. Under the existing

condition, the Price Street - South site has no beach access except from adjacent beaches during low tides. Therefore, the impacts of the revetment on beach use would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction of a vertical sea wall at the Price Street - South site would be similar to those of construction of a rock revetment. Bluff trail access would be restricted during construction. Construction of the vertical sea wall would take seven months compared to five months for revetment construction. Because the impedance to recreational use would be temporary, the impacts of vertical sea wall construction on recreation would be insignificant.

After construction is completed, the only impact the sea wall would have on recreation is loss of a small amount of beach. The sea wall would extend to + 8 feet MLLW, which is above the high tide line. The footprint of the vertical sea wall on the beach would be 0.16 acre, which is 6 percent of the beach. Under the existing conditions, the Price Street - South site has no beach access except from adjacent beaches during extreme low tides. The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to recreation of a sculpted concrete/shotcrete wall at the Price Street - South site would be the same as for a vertical sea wall; however, construction of the sculpted concrete/shotcrete wall would take eight months compared to seven months for the vertical sea wall. The impacts to recreation at the Price Street - South site would be insignificant.

No Action Alternative

Under the No Action alternative, all or some of the bluff trail may be lost, and the eroding bluff may pose a hazard to trail users. In addition, the tennis courts may eventually be lost. Under the No Action alternative, emergency revetments or sea walls may be constructed at this site which may result in a loss of beach area; however, under the existing conditions, the Price Street - South site has no beach access except from adjacent beaches during extreme low tides.

4.7.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The beach at the Cypress Street Lift Station site is a wide, sandy beach that supports a variety of recreational uses. The bluff trail in this area terminates at the site. The staging area during construction at this site would be both on the bluffs and on the beach. Recreational users would not be able to use the bluff top during the three months of revetment construction; however, the bluff-top access ends at the Cypress Street Lift Station. The temporary restriction on access would not interrupt access to other portions of the trail. Impacts of revetment construction on bluff-top recreation would be insignificant.

Beachgoers would be prevented from using the portion of the beach adjacent to the site during construction. The staging area represents a very small part of the wide, sandy beach in this area. The area that will be affected by revetment construction includes a portion of the volleyball

courts. Volleyball courts will need to be relocated temporarily during revetment construction. Temporary restriction of a small portion of the beach would be an insignificant impact.

The revetment footprint at the Cypress Street Lift Station site would extend to + 14 feet MLLW, which is above the reach of all tides except the most extreme tide and wave events. The footprint of the revetment would be 0.87 acre, but under existing conditions, all but 0.33 acre would be covered by sand. The amount of useable recreational beach that would be occupied by the revetment at Cypress Street Lift Station would be about 1 percent in this area. The revetment would not restrict any of the recreational activities, including the volleyball courts, that occur on the beach in this area. The impacts to recreation of a rock revetment at Cypress Street Lift Station would be insignificant.

Alternative 4: Steel Sheet Pile Wall

The impacts of construction of a steel sheet pile wall at Cypress Street Lift Station would be the same as for revetment construction, except that construction of the wall would take four months compared to three months for revetment construction. The impacts to recreation would be insignificant.

The footprint of the steel sheet pile wall would extend to + 14 feet MLLW. The footprint of the wall would be 0.15 acre, and most of the wall would be buried most of the time. Little to no recreational beach would be lost from construction of a steel sheet pile wall. The impacts to recreation would be insignificant.

No Action Alternative

Under the No Action alternative, continued erosion of the bluffs might result in loss of the bluff-top trail at this site and/or result in dangerous conditions for recreational users on the bluff top. Under the No Action alternative, emergency revetments or sea walls may be constructed at this site. Depending on how it was constructed, a revetment could result in the loss of a small portion of beach for recreational beach goers.

4.8 SAFETY

4.8.1 Environmental Setting

Bluff erosion represents a safety hazard in the Project area. The six sites identified for bluff protection are locations that pose the most immediate erosion hazard. Bluff retreat typically occurs in episodic events in which several to tens of feet of the bluff top are eroded from a specific area during a single sea or storm event (Fugro West 2002). Episodic bluff failure, in which a block of bluff falls onto the beach, can occur in any particular year, depending on the meteorological and oceanographic conditions (USACE 2002). On-going retreat is likely to continue to encroach upon existing structures located above the seacliff, undermine coastal stairways and seawalls, and erode adjacent lands, reducing building setbacks and eventually threatening structures. The bluff erosion threatens utilities including the three lift stations in the Project area. Price Street, a major thoroughfare adjacent to the bluffs, is immediately vulnerable to erosion (USACE 2002). If no action is taken to remedy the erosion near Price Street, the

erosion is expected ultimately to progress to the point where it becomes a significant threat to U.S. Highway 101 (USACE 2002).

In addition to bluff erosion, ocean waves pose a direct safety hazard in the Project area. The Project area is characterized by periodic large surf. Waves can endanger swimmers, surfers, divers, and small boats and can sweep beachcombers and surf fisherman off rocks and into the sea.

4.8.2 Environmental Consequences

4.8.2.1 Significance Criteria

Safety impacts would be considered significant if activities interfere with any emergency response or evacuation plans.

4.8.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

During the three-month construction of the rock revetment, about half of Seacliff Drive in the vicinity of the site would be used as a staging area. Vehicles in an emergency or evacuation would still be able to travel on Seacliff Drive. Impacts of construction staging to safety would be insignificant.

After construction, the rock revetment would not interfere with any emergency response or evacuation plans. The rock revetment would make the bluff top safer for people walking and sightseeing from the bluffs. The revetment also would help prevent potential erosion damage that might affect Seacliff Drive and make the road unsafe.

Alternative 2: Vertical Sea Wall

The construction impacts to safety of a vertical sea wall at the St. Andrews Lift Station site would be the same as for the rock revetment. During the four-month construction of the vertical sea wall, staging would occupy about half of Seacliff Drive, but emergency vehicles or vehicles evacuating the area would still be able to travel on the street. Impacts of construction to safety would be insignificant. After construction, the vertical sea wall would reduce erosion and, thus, reduce the likelihood of unsafe conditions on the bluff top and Seacliff Drive.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The construction impacts to safety of a sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be the same as construction of a vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The impacts of construction on safety would be insignificant. After construction, the sculpted concrete/shotcrete wall would improve safety of the bluff tops and potentially Seacliff Drive from erosion.

No Action Alternative

Under the No Action alternative, bluff erosion at the St. Andrews Lift Station site would continue. Erosion represents a potential safety hazard for persons using the bluff top. Eventually, the erosion might threaten Seacliff Drive and make the street less safe. If Seacliff Drive were lost to erosion, emergency access and evacuation in the area would be more difficult.

4.8.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

During the three-month construction of the rock revetment at the Vista del Mar Lift Station site, about half of Ocean Boulevard in the vicinity of the site would be used as a staging area. Vehicles in an emergency situation or evacuation would still be able to travel Ocean Boulevard. Impacts of construction staging to safety would be insignificant.

After construction, the rock revetment would not interfere with any emergency response or evacuation plans. The rock revetment would make the bluff top safer for people walking and sightseeing from the bluffs. The revetment also would make it less likely that stairway to the beach would become unsafe due to bluff erosion. The revetment also would help prevent potential erosion damage that might affect Ocean Boulevard and make the road unsafe.

Alternative 2: Vertical Sea Wall

The construction impacts to safety of a vertical sea wall at the Vista del Mar Lift Station site would be the same as for the rock revetment. During the four-month construction of the vertical sea wall, staging would occupy about half of Ocean Boulevard; but emergency vehicles or vehicles evacuating the area would still be able to travel on the street. Impacts of construction to safety would be insignificant. After construction, the vertical sea wall would reduce erosion and thus reduce the likelihood of unsafe conditions on the bluff top, stairs, and Ocean Boulevard.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The construction impacts to safety of a sculpted concrete/shotcrete wall at the Vista del Mar Lift Station site would be the same as construction of a vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The impacts of construction on safety would be insignificant. After construction, the sculpted concrete/shotcrete wall would improve safety of the bluff tops, stairs, and, potentially, Ocean Boulevard from erosion.

No Action Alternative

Under the No Action alternative, bluff erosion at the Vista del Mar Lift Station site would continue. Erosion represents a potential safety hazard for persons using the bluff top. Erosion also might make the stairway access to the beach dangerous. Eventually, the erosion might threaten Ocean Boulevard and make the street less safe. If Ocean Boulevard were lost to erosion, emergency access and evacuation in the area would be more difficult.

4.8.2.4 Ocean Park

Alternative 1: Rock Revetment

During the three-months of construction of the rock revetment at the Ocean Park site, about half of Ocean Boulevard in the vicinity of the site would be used as a staging area. Vehicles in an emergency situation or evacuation would still be able to travel Ocean Boulevard. Impacts of construction staging to safety would be insignificant.

After construction, the rock revetment would not interfere with any emergency response or evacuation plans. The rock revetment would make the bluff top safer for people walking and sightseeing from the bluffs. The revetment also would help prevent potential erosion damage that might affect Ocean Boulevard and make the road unsafe.

Alternative 2: Vertical Sea Wall

The construction impacts to safety of a vertical sea wall at the Ocean Park site would be the same as for the rock revetment. During the four-month construction of the vertical sea wall, staging would occupy about half of Ocean Boulevard; but emergency vehicles or vehicles evacuating the area would still be able to travel on the street. Impacts of construction to safety would be insignificant. After construction, the vertical sea wall would reduce erosion and, thus, reduce the likelihood of unsafe conditions on the bluff top and Ocean Boulevard.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The construction impacts to safety of a sculpted concrete/shotcrete wall at the Ocean Park site would be the same as construction of a vertical sea wall, except construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The impacts of construction on safety would be insignificant. After construction, the sculpted concrete/shotcrete wall would improve safety of the bluff tops and, potentially, Ocean Boulevard from erosion.

No Action Alternative

Under the No Action alternative, bluff erosion at the Ocean Park site would continue. Erosion represents a potential safety hazard for persons using the bluff top. Eventually the erosion might threaten Ocean Boulevard and make the street less safe. If Ocean Boulevard were lost to erosion, emergency access and evacuation in the area would be more difficult.

4.8.2.5 Price Street – North

Alternative 1: Rock Revetment

During the five months of construction of the rock revetment at the Price Street - North site, the staging area at the site would extend onto Price Street and, at times, might occupy the entire width of Price Street. If Price Street were needed for emergency access or evacuation, the equipment would be moved to provide access. The impacts to safety of revetment construction at the Price Street - North site would be insignificant.

After construction, the rock revetment would not interfere with any emergency response or evacuation plans. The rock revetment would make the bluff top safer for people walking and sightseeing from the bluffs. The revetment also would help prevent potential erosion damage that might affect Price Street and make the road unsafe.

Alternative 2: Vertical Sea Wall

The construction impacts to safety of a vertical sea wall at the Price Street - North site would be the same as for the rock revetment. During the seven-month construction of the vertical sea wall, staging would occupy at least part of the width of Price Street adjacent to the site and, at times, might occupy the entire width. If Price Street were needed for emergency access or evacuation, the equipment would be moved to provide access. Impacts of construction to safety would be insignificant. After construction, the vertical sea wall would reduce erosion and, thus, reduce the likelihood of unsafe conditions on the bluff top and Price Street.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The construction impacts to safety of a sculpted concrete/shotcrete wall at the Price Street - North site would be the same as construction of a vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take eight months compared to seven months for the vertical sea wall. The impacts of construction on safety would be insignificant. After construction, the sculpted concrete/shotcrete wall would improve safety of the bluff tops and, potentially, Price Street from erosion.

No Action Alternative

Under the No Action alternative, bluff erosion at the Price Street - North site would continue. Erosion represents a potential safety hazard for persons using the bluff top. Eventually, the erosion might threaten Price Street and make the street less safe. If Price Street were lost to erosion, emergency access and evacuation in the area would be more difficult.

4.8.2.6 Price Street – South

Alternative 1: Rock Revetment

During the five months of construction of the rock revetment at the Price Street - South site, the staging area at the site would extend onto Price Street and, at times, might occupy the entire width of Price Street. If Price Street were needed for emergency access or evacuation, the equipment would be moved to provide access. The impacts to safety of revetment construction would be insignificant.

After construction, the rock revetment would not interfere with any emergency response or evacuation plans. The rock revetment would make the bluff top safer for people walking and sightseeing from the bluffs. The revetment also would help prevent potential erosion damage that might affect Price Street and make the road unsafe.

Alternative 2: Vertical Sea Wall

The construction impacts to safety of a vertical sea wall at the Price Street - South site would be the same as for the rock revetment. During the seven-month construction of the vertical sea wall, staging would occupy at least part of the width of Price Street adjacent to the site and, at times, might occupy the entire width. If Price Street were needed for emergency access or evacuation, the equipment would be moved to provide access. Impacts of construction to safety would be insignificant. After construction, the vertical sea wall would reduce erosion and, thus, reduce the likelihood of unsafe conditions on the bluff top and Price Street.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The construction impacts to safety of a sculpted concrete/shotcrete wall at the Price Street - South site would be the same as construction of a vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take eight months compared to seven months for the vertical sea wall. The impacts of construction on safety would be insignificant. After construction, the sculpted concrete/shotcrete wall would improve safety of the bluff tops and potentially Price Street.

No Action Alternative

Under the No Action alternative, bluff erosion at the Price Street - South site would continue. Erosion represents a potential safety hazard for persons using the bluff top. Eventually, the erosion might threaten Price Street and make the street less safe. If Price Street were lost to erosion, emergency access and evacuation in the area would be more difficult.

4.8.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The staging area during the three months of rock revetment construction at the Cypress Street Lift Station site will be on Cypress Street adjacent to the site and on the beach. Because Cypress Street is a dead end at the site, the presence of equipment would not block emergency access or impede evacuation. The impacts of construction of a rock revetment at the Cypress Street Lift Station site would be insignificant.

After construction, the revetment itself will have no effect on emergency access or evacuation. The revetment will help to stabilize the bluffs and will make the bluff top safer for people at the site.

Alternative 4: Steel Sheet Pile Wall

The construction impacts to safety of a steel sheet pile wall at the Cypress Street Lift Station site would be the same as for construction of a rock revetment, except that steel sheet pile wall construction would take four months compared to three months for a revetment. The impacts of construction on safety would be insignificant.

The vertical sheet pile wall would not affect emergency access or evacuation. By stabilizing the bluffs, the vertical sheet pile wall would improve safety for persons using the bluff top.

No Action Alternative

Under the No Action alternative, bluff erosion at the Cypress Street Lift Station site would continue. Erosion represents a potential safety hazard for persons using the bluff top.

4.9 LAND USE

4.9.1 Environmental Setting

The Project area, from the northern end of Pismo State Beach to Memory Park in Shell Beach, includes the bluff tops, bluffs, and beach. Land uses in the northern portion are primarily low density residential and open space (City of Pismo Beach 1993). The central portion of the area is characterized by open space and hotels. The southern-most site, the Cypress Street Lift Station, is in the downtown commercial core. Policy P-14 of the City of Pismo Beach General Plan/Local Coastal Plan (City of Pismo Beach 1993) states:

> "Immediate Ocean Shoreline – The ocean, beach and the immediate abutting land are recognized as an irreplaceable national resource to be enjoyed by the entire city and region. This unique narrow strip of land should receive careful recognition and planning. The purpose of the beach is to make available to the people, for their benefit and enjoyment forever, the scenic, natural, cultural, and recreational resources of the ocean, beach and related uplands."

The Land Use Element of the City of Pismo Beach General Plan/Local Coastal Plan divides the City of Pismo Beach into 18 Neighborhood Planning Areas. Specific background and policies apply to each area. Land uses at each of the six Project sites are discussed below.

St. Andrews Lift Station – The St. Andrews Lift Station site is in the St. Andrews Tract Planning Area. The St. Andrews Planning Area is almost completely developed with single-family houses, apartments, and a fire station. The land use designation along the bluffs near the site is Low Density Residential. The planning area includes Memory Park, a small bluff-top park with picnic tables, a barbeque, and beaches.

Vista del Mar Lift Station and Ocean Park – The Vista del Mar Lift Station and Ocean Park sites are located in the Shell Beach Planning Area. This planning area is essentially fully developed. Land uses along the bluffs include Low Density Residential, Medium Density Residential, and Open Space. The Shell Beach Planning Area includes Eldwayen Ocean Park, a developed park with lawn, picnic areas, and beach access. The rest of the bluff-top development in this planning area is residential.

Price Street - North – The Price Street - North site is in the Dinosaur Caves Planning Area. The Dinosaur Caves Planning Area is designated for Resort Commercial and Open Space. The area includes the Best Western Shelter Cove Hotel and Dinosaur Caves Park. The Dinosaur Caves Planning Area is oriented to open space, parks, and visitor-serving uses with related public

lateral bluff-top access and open space. This planning area, because it is open, also provides scenic views from Highway 1.

Price Street - South - The Price Street - South site is located in the Motel District. Land uses within the Motel District include Resort Commercial, Medium Density Residential, and Open Space. This portion of the city is highly used by out-of-town visitors because of the concentration of motels and the close proximity to the downtown area and beachfront. The Best Western Shorecliff Inn is near the Price Street - South site. The site includes parking, a bluff-top walk, and a gazebo with a view of offshore rocks at the hotel.

Cypress Street Lift Station – The Cypress Street Lift Station site is located in the Downtown Core area in the Central Commercial District. The Downtown Core area encompasses downtown Pismo Beach, an important visitor-serving section of the city. The primary land use focus for the Central Commercial District is commercial, recreational, and cultural.

Pismo State Beach is located adjacent to the bluffs near the Cypress Street Lift Station site. The bluffs are about 40 feet high at the Cypress Street Lift Station site and gradually decline in elevation toward the south, reaching five feet high at the pier. Pismo State Beach is the major recreation area in the city. Public access ways to the beach and public restrooms are located near the site.

4.9.2 Environmental Consequences

4.9.2.1 Significance Criteria

Impacts would be considered significant if access to existing uses is substantially restricted or is eliminated.

4.9.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

The St. Andrews Lift Station site is in an area zoned as low density residential. The site is near Memory Park. During the three months of revetment construction, the staging area would occupy a portion of Memory Park. Therefore, use of part of the park as well as the adjacent bluff top area would temporarily be restricted. Use would return to existing conditions when construction is completed. Construction also would temporarily restrict beach use at this site. The impacts of revetment construction at the St. Andrews Lift Station site would be temporary and insignificant.

The rock revetment would occupy about 0.18 acre of the existing beach; therefore, the revetment would limit beach use more than the existing condition, but it would not substantially restrict or eliminate it. Impacts to land use of a revetment at the St. Andrews Lift Station site would be insignificant.

Alternative 2: Vertical Sea Wall

The staging area for the vertical sea wall at the St. Andrews Lift Station site would be the same as for construction of a rock revetment. A portion of Memory Park and the bluff top would be

occupied by equipment during the four months of construction of the vertical sea wall. The impacts to land use would be insignificant.

The footprint of the sea wall on the beach would be smaller than the revetment (0.06 acre for the sea wall compared to 0.18 acre for the revetment). The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to land use of a sculpted/shotcrete wall at the St. Andrews Lift Station site would be the same as the vertical sea wall, except construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The footprint of the sculpted concrete/shotcrete wall on the beach would be the same as the vertical sea wall. Impacts to land use would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the St. Andrews Lift Station site would continue to erode. It is likely that the use of some or all of Memory Park would be lost. In addition, the erosion could threaten nearby houses and result in the loss of some houses near the site.

4.9.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

The bluff top at the Vista del Mar Lift Station site is zoned as open space. The bluff top is used for walking and enjoying views of the shoreline. Stairs provide access to the beach. During the three months of revetment construction, the bluff top at the site will be used for staging. People will not be able to use the bluff top at the site during this period. Construction activities also temporarily will preclude use of the beach. Bluff and beach use will be available once construction is finished. The impacts of revetment construction at the Vista del Mar Lift Station site would be insignificant.

The rock revetment would occupy about 0.17 acre of the existing beach; therefore, the revetment would limit beach use more than the existing condition, but it would not substantially restrict or eliminate it. Impacts to land use of a revetment at the Vista del Mar Lift Station site would be insignificant.

Alternative 2: Vertical Sea Wall

The staging area for the vertical sea wall at the Vista del Mar Lift Station site would be the same as for construction of a rock revetment. A portion of the beach and the bluff top would be occupied by equipment during the four months it would take to construct the vertical sea wall. The footprint of the sea wall on the beach would be smaller than the revetment (0.06 acre for the sea wall compared to 0.17 acre for the rock revetment). The impacts to land use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to land use of a sculpted/shotcrete wall at the Vista del Mar Lift Station site would be the same as the vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The footprint of the sculpted concrete/shotcrete wall on the beach would be the same as the vertical sea wall. Impacts to land use would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Vista del Mar Lift Station site would continue to erode. This continued erosion is likely to result in loss of the bluff-top trail. In addition, continued erosion might result in loss of the beach stairway and, therefore, loss of beach use.

4.9.2.4 Ocean Park

Alternative 1: Rock Revetment

The Ocean Park site is in an area zoned as open space and low density residential. The site has no beach access. During the three months of revetment construction, the staging area would occupy a portion of the bluff top at the site. Therefore, use of the bluff-top area would temporarily be restricted. Use would return to existing conditions when construction is completed. The impacts of revetment construction to land use at the Ocean Park site would be insignificant.

Alternative 2: Vertical Sea Wall

The staging area for the vertical sea wall at the Ocean Park site would be the same as for construction of a rock revetment. A portion of the bluff top would be occupied by equipment during the four months it would take to construct the vertical sea wall. The impacts to land use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to land use of a sculpted/shotcrete wall at the Ocean Park site would be the same as the vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take five months compared to four months for the vertical sea wall. The footprint of the sculpted concrete/shotcrete wall on the beach would be the same as the vertical sea wall. Impacts to land use would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Ocean Park site would continue to erode. It is likely that the use of the bluff-top trail and amenities, like benches, would be lost. In addition, the erosion could threaten nearby houses and result in the loss of some houses near the site.

4.9.2.5 Price Street – North

Alternative 1: Rock Revetment

The bluff top at the Price Street - North site is zoned as open space. There is a bluff-top trail for recreational use. The beach at the site can be accessed via a trail from the Best Western Shelter Cove Hotel. During the five months of revetment construction, the staging area would occupy a portion of the bluffs; therefore, use of part of the bluff-top area would temporarily be restricted. Use would return to normal when construction is completed. Construction activities also temporarily would restrict beach use at the site. Because construction is temporary and would restrict only a portion of available bluff top and beach use, the impacts of revetment construction at the Price Street - North site would be insignificant.

The rock revetment would occupy about 0.39 acre of the existing beach; therefore, the revetment would limit beach use more than the existing condition, but it would not substantially restrict or eliminate it. Impacts to land use of a revetment at the Price Street - North site would be insignificant.

Alternative 2: Vertical Sea Wall

The staging area for the vertical sea wall at the Price Street - North site would be the same as for construction of a rock revetment. A portion of the bluff top and beach would be occupied by equipment during the seven months it would take to construct the vertical sea wall. The footprint of the sea wall on the beach would be smaller than the revetment (0.22 acre for the sea wall compared to 0.39 acre for the revetment). The impacts to land use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to land use of a sculpted/shotcrete wall at the Price Street - North site would be the same as the vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take eight months compared to seven months for the vertical sea wall. The footprint of the sculpted concrete/shotcrete wall on the beach would be the same as the vertical sea wall. Impacts to land use would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Price Street - North site would continue to erode. It is likely that the use of some or all the bluffs would be lost.

4.9.2.6 Price Street – South

Alternative 1: Rock Revetment

The Price Street - South site is in an area zoned as open space and resort commercial. Recreational uses at the site include a bluff-top trail and nearby tennis courts. During the five months of revetment construction, the staging area would occupy a portion of the bluff tops; therefore, use of part of the bluff top area would temporarily be restricted. Use would return to existing conditions when construction is completed. Use of the tennis courts would not be

affected. The impacts of revetment construction at the Price Street - South site would be insignificant.

The rock revetment would occupy about 0.16 acre of the existing beach; therefore, the revetment would limit beach use more than the existing condition. However, under the existing condition, the site has no beach access. Impacts to land use of a revetment at the Price Street - South site would be insignificant.

Alternative 2: Vertical Sea Wall

The staging area for the vertical sea wall at the Price Street - South site would be the same as for construction of a rock revetment. A portion of the bluff top would be occupied by equipment during the seven months it would take to construct the vertical sea wall. The impacts to land use would be insignificant.

The footprint of the sea wall on the beach would be 0.12 acre. Currently, the Price Street – South site has no beach access. The impacts of the vertical sea wall on beach use would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to land use of a sculpted/shotcrete wall at the Price Street - South site would be the same as the vertical sea wall, except that construction of the sculpted concrete/shotcrete wall would take eight months compared to seven months for the vertical sea wall. The footprint of the sculpted concrete/shotcrete wall on the beach would be the same as the vertical sea wall. Impacts to land use would be insignificant.

No Action Alternative

Under the No Action alternative, the bluffs at the Price Street - South site would continue to erode. It is likely that the use of some or the entire bluff-top trail at the site would be lost. In addition, the erosion could threaten the nearby tennis courts, and use of the tennis courts may be lost.

4.9.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The Cypress Street Lift Station is located in the Central Commercial District of Pismo Beach. The site is at the end of Cypress Street and the bluff-top trail. Residences are adjacent to the site. A wide, sandy beach is used for a variety of recreational activities below the site. During the three months of revetment construction, use of the trail and the beach adjacent to the base of the bluffs at the site would be precluded. The staging and construction areas represent a small portion of the available bluff and beach. Impacts to land use would be insignificant.

The footprint of the revetment would be 0.87 acre, but under existing conditions, all but 0.33 acre would be covered by sand. The amount of useable recreational beach that would be occupied by the revetment at Cypress Street Lift Station would be small and would not

substantially affect recreational use of the beach. The impacts to land use of a rock revetment at Cypress Street Lift Station would be insignificant

Alternative 4: Steel Sheet Pile Wall

The impacts of construction of a steel sheet pile wall at Cypress Street Lift Station would be the same as for revetment construction, except that construction of the wall would take four months compared to three months for revetment construction. The footprint of the wall would be 0.15 acre, and most of the wall would be buried most of the time. Little to no recreational beach would be lost from construction of a steel sheet pile wall. The impacts to land use would be insignificant.

No Action Alternative

Under the No Action alternative, continued erosion of the bluffs might result in loss of the bluff-top trail at this site and/or dangerous conditions for recreational users on the bluff top. In addition, houses near the bluffs might be threatened by continued erosion.

4.10 NOISE

4.10.1 Environmental Setting

Noise is measured in units called decibels (dB). The dB level decreases with distance from the source, usually at a rate of 6 dB for every doubling of distance. The primary noise sources in the Project area are surf, wind, aircraft flyovers, marine vessels, and traffic. A noise survey was conducted for Pismo Beach during August 1990 in the general Project area (City of Pismo Beach 1993). Maximum noise levels ranged from 63 to 70 dB and generally were due to traffic. Minimum levels were from traffic and wind and ranged from 25 to 40 dB. The USACE took day and night measurements at each of the six sites in April 2010. Day measurements ranged from 60.5 dBA on the beach at the Cypress Street Lift Station site to 68 dBA on the bluffs at Price Street - South. Night measurements ranged from 60.5 dBA on the beach at the Cypress Street Lift Station site to 71 dBA on the bluffs at the Vista del Mar Lift Station site.

4.10.1.1 St. Andrews Lift Station

Land uses adjacent to this site include single-family residential and open-space. The nearest house is 25 feet from the proposed construction area. Dominant noise sources at this location include ocean waves, light traffic noise, and landscaping equipment.

Two ambient noise measurements were taken at this site in April 2010. The two measurements were representative of daytime and nighttime noise levels. The measurements taken on the bluff were 61.0 dBA (daytime) and 60.7 dBA (nighttime). Measurements on the beach were not feasible. The elevational difference between the bluff and the proposed construction area at this location is generally 10 feet.

4.10.1.2 Vista del Mar Lift Station

Land uses adjacent to this site include single-family residential and open-space. The nearest house is 60 feet from the proposed construction area. Dominant noise sources at this location include ocean waves, light traffic noise, and landscaping equipment.

Four ambient noise measurements were taken at this site in April 2010. Two measurements were taken on the bluff above the beach, and two were taken on the beach itself. The two measurements at each location were representative of daytime and nighttime noise levels. The measurements taken on the beach were 64.4 dBA (daytime) and 63.5 dBA (nighttime); and 65.2 dBA (daytime) and 71.0 dBA (nighttime) on the bluff. Significantly higher noise levels during the nighttime on the bluff were likely due to high tide conditions and the proximity of breaking waves. The elevational difference between the bluff and the proposed construction area at this location is generally 3 feet.

4.10.1.3 Ocean Park

Land uses adjacent to this site include single-family residential and open-space. The nearest house is 50 feet from the proposed construction area. Dominant noise sources at this location include ocean waves, light traffic noise, and landscaping equipment.

Two ambient noise measurements were taken at this site in April 2010. The two measurements were representative of daytime and nighttime noise levels. The measurements taken on the bluff were 65.8 dBA (daytime) and 68.7 dBA (nighttime). Measurements on the beach were not feasible. The elevational difference between the bluff and the proposed construction area at this location ranges from 3 to 10 feet.

4.10.1.4 Price Street - North

Land uses that may be affected by construction noise at this site include a single family residential neighborhood located approximately 500 feet to the northeast of the proposed construction area; and single-family houses located approximately 1,200 feet north of the proposed construction site. State Route 101 lies between the construction site and the houses to the northeast. Shore Cliff Lodge, approximately 150 feet to the southeast, also would be affected by construction noise. Dominant noise sources at this location include ocean waves and moderate traffic noise. State Route 1/101 is situated 130 feet to the northeast of the proposed construction area.

Two ambient noise measurements were taken at this site in April 2010. The two measurements were representative of daytime and nighttime noise levels. The measurements taken on the bluff were 63.7 dBA (daytime) and 64.8 dBA (nighttime). Measurements on the beach were not feasible. The elevational difference between the bluff and the proposed construction area at this location ranges from 30 to 84 feet.

4.10.1.5 Price Street - South

Land uses that may be affected by construction noise at this site include Best Western Shore Cliff Lodge, which is situated approximately 200 feet north of the proposed staging area and

approximately 700 feet north of the construction site, and Best Western Shelter Cove Lodge, which is located approximately 630 feet south of the proposed construction site and staging area. Dominant noise sources at this location include ocean waves and moderate traffic noise. Price Street is adjacent to the proposed site, and State Route 1/101 is situated approximately 100 feet to the northeast.

Two ambient noise measurements were taken at this site in April 2010. The two measurements were representative of daytime and nighttime noise levels. The measurements taken on the bluff were 68.0 dBA (daytime) and 66.2 dBA (nighttime). Measurements on the beach were not feasible. The elevational difference between the bluff and the proposed construction area at this location ranges from 20 to 100 feet.

4.10.1.6 Cypress Street Lift Station

Land uses adjacent to this site include single- and multiple-family residential and open-space. The nearest house is 10 feet from the proposed construction area. A hotel is located immediately south of the site. Dominant noise sources at this location include ocean waves, people recreating on the beach, light traffic noise, and landscaping equipment.

Four ambient noise measurements were taken at this site in April 2010. Two measurements were taken on the bluff above the beach, and two were taken on the beach itself. The two measurements at each location were representative of daytime and nighttime noise levels. The measurements taken on the beach were both 60.5 dBA. The measurements on the bluff were 61.5 dBA (daytime) and 61.8 dBA (nighttime). The elevational difference between the bluff and the proposed construction area at this location varies from 3 to 7 feet.

4.10.2 <u>Environmental Consequences</u>

4.10.2.1 Significance Criteria

Project noise impacts would be considered significant if noise resulting from the Project results in an increase of 10 dBA above background during the day or a night-time increase of 5 dBA above background. This is a short-term project, and a perceived daytime doubling of noise levels is considered to be significant. No nighttime construction will occur for this Project.

<u>Applicable City of Pismo Beach Noise Thresholds</u>

City of Pismo Beach General Plan Policy 20 states that the City will take actions to ensure that residents and workers in the city and visitors to the city will not be subjected to excessive levels of noise.

City of Pismo Beach Municipal Ordinance 9.24.050, Prohibited Acts

5. Construction/Demolition.

    a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of 7:00 p.m. and 7:00 a.m., or any time on Sundays or holidays, such that the sound

there from creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by exception issued by the noise control officer. This section shall not apply to the use of domestic power tools as specified in subsection B-8 of this section.

b. Noise Restrictions at Affected Properties. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels associated with mobile construction equipment does not exceed 75 dBA, daily except Sundays and legal holidays between the hours of 7:00 a.m. and 7:00 p.m. or exceed 60 dBA, daily including Sundays and legal holidays between the hours of 7:00 p.m. and 7:00 a.m. at single family houses; maximum noise levels associated with stationary construction equipment does not exceed 60 dBA, daily except Sundays and legal holidays between the hours of 7:00 a.m. and 7:00 p.m. or exceed 50 dBA, daily including Sundays and legal holidays between the hours of 7:00 p.m. and 7:00 a.m. at single family houses.

At business properties, mobile construction equipment shall not result in maximum noise levels that exceed 85 dBA, daily including Sunday and legal holidays, all hours; and stationary equipment shall not result in maximum noise levels that exceed 75 dBA daily, including Sundays and legal holidays, all hours.

All mobile stationary internal combustion engine powered equipment or machinery shall be equipped with suitable exhaust and air-take silencers in proper working order.

Table 4-28 presents typical construction noise equipment levels at a distance of 50 feet.

Table 4-29 compares predicted noise levels at sensitive receptors to ambient noise and significance criteria.

Table 4-28: Typical Construction Equipment Noise Levels

Type of Equipment	Range of Maximum Sound Levels Measured (dBA at 50 ft.)	Suggested Maximum Sound Levels for Analysis (dBA at 50 ft.)
Rock Drills	83-99	96
Jack Hammers	75-85	82
Pneumatic Tools	78-88	85
Pumps	74-84	80
Dozers	77-90	85
Scrapers	83-91	87
Haul Trucks	83-94	88
Cranes	79-86	82
Portable Generators	71-87	80
Rollers	75-82	80
Tractors	77-82	80
Front-End Loaders	77-90	86
Hydraulic Backhoe	81-90	86
Hydraulic Excavators	81-90	86
Graders	79-89	86
Air Compressors	76-89	86
Trucks	81-87	86

Table 4-29: Construction Noise at Each Site

	Ambient				Construction		Increase	Significance Criteria	Reduction Required
Site	**Day**		**Night**		**Staging**	**Slope***			
	Bluff	**Beach**	**Bluff**	**Beach**					
St. Andrews Lift Station	61.0		60.7		82	75	**21.0**	10	11.0
Vista del Mar Lift Station	65.2	64.4	71.0	63.5	82	75	**16.8**	10	6.8
Ocean Park	65.8		68.7		82	75	**16.2**	10	6.2
Price Street – North	63.7		64.8		70	69	6.3	10	0.0
Price Street – South	68.0		66.2		70	69	2.0	10	0.0
Cypress Street Lift Station	61.5	60.5	61.8	60.5	82	75	**20.5**	10	10.5

Bold=significant

4.10.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

Construction of the revetment at the St. Andrews Lift Station site would result in an average of 30 truck trips per day. Figure 2-26 shows the likely truck route. Although 30 additional truck trips per day on surface area roadways will be noticeable primarily in residential areas, these trucks will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Seacliff Drive and on the slope extending towards the ocean. This staging site is immediately adjacent to single-family houses. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA, an increase of 21 dB over ambient. Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity. Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. Noise impacts could be reduced to insignificant with the following measures.

- The construction contractor shall be required to implement a methodology capable of attenuating maximum noise events by up to 11 dBA.
- The City shall notify all residents and businesses within 100 feet of the construction staging site for each site of the construction schedule.
- The City shall set up a hotline for noise complaints associated with the proposed Project. All noise complaints shall be investigated, construction noise shall be measured at the site, and the effectiveness of the noise reduction measures shall be re-evaluated.

Alternative 2: Vertical Sea Wall

The sea wall alternative also would result in the generation of up to 30 truck trips per day. Although an additional 30 truck trips per day will be noticeable primarily in residential areas, noise generated by these trucks will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Seacliff Drive and on the slope extending towards the ocean. This staging site is immediately adjacent to single-family houses. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA, an increase of 21 dB over ambient.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, fork lift, excavator, concrete pump truck, and compressor. Maximum noise levels due to construction noise on the slope at nearby houses are expected to

reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. Impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

Alternative 3: Sculpted Concrete/Shotcrete Wall

This alternative would result in the generation of up to 27 truck trips per day. Although an additional 27 truck trips per day will be noticeable primarily in residential areas, noise generated by these trucks will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Seacliff Drive and on the slope extending towards the ocean. This staging site is immediately adjacent to single-family houses. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA. Assuming continuous operation of a crane, hourly noise levels also are expected to reach 82 dBA Leq.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, fork lift, loader, excavator, concrete pump truck, and compressor. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level.. Unmitigated construction noise levels may also exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. Impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

<u>No Action Alternative</u>

The No Action Alternative would avoid the temporary noise impacts; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Seacliff Drive might eventually be lost.

4.10.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

Construction of the revetment at the Vista del Mar Lift Station site would result in an average of 29 truck trips per day. Figure 2-27 shows the likely truck route. Although an addition of 29 truck trips on surface area roadways will be noticeable primarily in residential areas, 29 additional truck trips per day will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the western half of Ocean Boulevard, extending west out to the edge of the bluff. This staging site is approximately 20 feet from the nearest single-family house. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA, an increase of 16.8 dB over ambient.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. Impacts can be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

Alternative 2: Vertical Sea Wall

This alternative would result in the generation of up to 26 truck trips per day. Although an additional 26 truck trips will be noticeable primarily in residential areas, noise generated by these trucks will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the western half of Ocean Boulevard, extending west out to the edge of the bluff. This staging site is approximately 20 feet from the nearest single-family house. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, fork lift, loader, excavator, compressor, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of

Pismo Beach Noise Ordinance 9.24.050. The impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

Alternative 3: Sculpted Concrete/Shotcrete Wall

This alternative would result in the generation of up to 28 truck trips per day. Although an additional 28 truck trips per day will be noticeable primarily in residential areas, noise generated by these trucks will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the western half of Ocean Boulevard extending west out to the edge of the bluff. This staging site is approximately 20 feet from the nearest single-family house. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, fork lift, loader, excavator, compressor, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. The impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

No Action Alternative

The No Action alternative would avoid temporary noise impacts; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Ocean Boulevard might eventually be lost.

4.10.2.4 Ocean Park

Alternative 1: Rock Revetment

Construction of the revetment at the Ocean Park site would result in an average of 26 truck trips per day. Figure 2-27 shows the likely truck route. Although an addition of 26 truck trips on surface area roadways will be noticeable primarily in residential areas, they would not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the western half of Ocean Boulevard, extending west out to the edge of the bluff. This staging site is approximately 20 feet from the nearest single family house. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA, an increase of 16.2 dB over ambient.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. Impacts can be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

Alternative 2: Vertical Sea Wall

This alternative would result in the generation of up to 28 truck trips per day. Although an additional 28 truck trips per day will be noticeable primarily in residential areas, noise generated by 28 additional truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the western half of Ocean Boulevard, extending west out to the edge of the bluff. This staging site is approximately 20 feet from the nearest single-family house. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, fork lift, loader, excavator, compressor, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. The impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

Alternative 3: Sculpted Concrete/Shotcrete Wall

This alternative would result in the generation of up to 30 truck trips per day. Although an additional 30 truck trips per day will be noticeable primarily in residential areas, noise generated by an additional 30 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the western half of Ocean Boulevard, extending west out to the edge of the bluff. This staging site is approximately 20 feet from the nearest single-

family house. Maximum noise levels due to activities at construction staging sites are expected to reach 82 dBA. Assuming continuous operation of a crane, hourly noise levels also are expected to reach 82 dBA Leq.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, fork lift, loader, excavator, compressor, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. Unmitigated construction noise levels also may exceed City of Pismo Beach General Plan thresholds for stationary noise and violate City of Pismo Beach Noise Ordinance 9.24.050. The impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

No Action Alternative

The No Action alternative would avoid the temporary noise impacts; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Ocean Boulevard might eventually be lost.

4.10.2.5 Price Street – North

Alternative 1: Rock Revetment

Construction of the revetment at the Price Street - North site would result in an average of 30 truck trips per day.

Figure 2-28 shows the likely truck route. Although an addition of 30 truck trips on surface area roadways will be noticeable primarily in residential areas, they would not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Price Street, extending west out to the edge of the bluff. This staging site is located approximately 150 feet from the nearest sensitive receptor, Shore Cliffs Lodge. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 70 dBA at the nearby Lodge, an increase of 6.3 dB over ambient.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 69 dBA. Hourly average noise levels are expected to be 69 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities likely will not cause maximum noise level increases of 10 dBA or more above the background noise level. These increases will not be readily audible at nearby sensitive receptors due to ambient noise levels and attenuation provided by distance.

Alternative 2: Vertical Sea Wall

This alternative would result in the generation of up to 32 truck trips per day. Although an additional 32 truck trips per day will be noticeable primarily in residential areas, noise generated by an additional 32 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Price Street, extending west out to the edge of the bluff. This staging site is located approximately 150 feet from the nearest sensitive receptor, Shore Cliffs Lodge. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 70 dBA at the nearby Lodge.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, fork lift, compressor, loader, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 69 dBA. Hourly average noise levels are expected to be 69 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities likely will not cause maximum noise level increases of 10 dBA or more above the background noise level.. These increases will not be readily audible at nearby sensitive receptors due to ambient noise levels and attenuation provided by distance.

Alternative 3: Sculpted Concrete/Shotcrete Wall

This alternative would result in the generation of up to 33 truck trips per day. Although an additional 33 truck trips per day will be noticeable primarily in residential areas, noise generated by an additional 33 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Price Street, extending west out to the edge of the bluff. This staging site is located approximately 150 feet from the nearest sensitive receptor, Shore Cliffs Lodge. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 70 dBA at the nearby Lodge.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, compressor, fork lift, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 69 dBA. Hourly average noise levels are expected to be 69 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities likely will not cause maximum noise level increases of 10 dBA or more above the background noise level. These increases will not be readily audible at nearby sensitive receptors due to ambient noise levels and attenuation provided by distance.

No Action Alternative

The No Action alternative would avoid temporary noise impacts; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Price Street might eventually be lost.

4.10.2.6 Price Street – South

Alternative 1: Rock Revetment

This alternative would result in the generation of up to 29 truck trips per day. Although an additional 29 truck trips per day will be noticeable primarily in residential areas, noise generated by an additional 29 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Price Street, extending west out to the edge of the bluff. This staging site is located approximately 200 feet from the nearest sensitive receptor, Shore Cliffs Lodge. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 70 dBA at the nearby Lodge, an increase of 2 dB over ambient.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, excavator, and concrete pump truck. Noise of construction on the bluffs would be 69 dBA and would not be audible at the hotel or residences. Impacts of noise at the Price Street - South site would be insignificant.

Alternative 2: Vertical Sea Wall

This alternative would result in the generation of up to 29 truck trips per day. Although an additional 29 truck trips per day will be noticeable in primarily residential areas, noise generated by an additional 29 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Price Street, extending west out to the edge of the bluff. This staging site is located approximately 200 feet from the nearest sensitive receptor, Shore Cliffs Lodge. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 70 dBA at the nearby Lodge.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, compressor, fork lift, excavator, and concrete pump truck. Because of the distance of the construction site from the Lodge and residences, the noise of construction on the bluffs would not be audible to sensitive receptors. The impacts of noise at the Price Street - South site would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

This alternative would result in the generation of up to 31 truck trips per day. Although an additional 31 truck trips per day will be noticeable primarily in residential areas, noise generated by an additional 31 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited within the southwestern half of Price Street, extending west out to the edge of the bluff. This staging site is located approximately 200 feet from the nearest sensitive receptor, Shore Cliffs Lodge. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 70 dBA at the nearby Lodge.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, compressor, fork lift, excavator, and concrete pump truck. Because of the distance of the construction site from the Lodge and residences, the noise of construction on the bluffs would not be audible to sensitive receptors. The impacts of noise at the Price Street - South site would be insignificant.

No Action Alternative

The No Action alternative would avoid temporary noise impacts; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Price Street might eventually be lost.

4.10.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

This alternative would result in the generation of up to 31 truck trips per day. Although an additional 31 truck trips per day will be noticeable in primarily residential areas, noise generated by an additional 31 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited along the western half of Cyprus Street, extending north from San Luis Avenue, immediately adjacent to four single-houses, and on the beach immediately west of houses. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA, an increase of 20.5 dB over ambient.

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, excavator, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby houses are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. The noise impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

Alternative 4: Steel Sheet Pile Wall

This alternative would result in the generation of up to 35 truck trips per day. Although an additional 35 truck trips per day will be noticeable primarily in residential areas, noise generated by an additional 35 truck trips will not result in a significant increase in the average-hour noise level.

Construction staging will be sited along the western half of Cypress Street, extending north from San Luis Avenue, immediately adjacent to four single-family homes, and on the beach immediately west of homes. Maximum noise levels due to activities at construction staging sites, during operation of a crane, are expected to reach 82 dBA at the nearby homes

Construction activities on the beach and the adjacent slope are expected to include the following equipment: truck crane, loader, compressor, fork lift, jack hammer or pile driver, excavator, welding machine, and concrete pump truck. Maximum noise levels due to construction noise on the slope at nearby homes are expected to reach 75 dBA. Hourly average noise levels are expected to be 75 dBA. Exact noise reduction provided by the bluff will vary, depending on the slope and angle down to the construction activity.

Unmitigated Project construction activities may cause maximum noise level increases of at least 10 dBA above the background noise level. The noise impacts could be reduced to insignificant by implementing the three measures described in the rock revetment alternative for the St. Andrews Lift Station site.

No Action Alternative

The No Action alternative would avoid the temporary noise impacts. Bluff erosion might eventually affect the end of Cypress Street.

4.11 VEHICULAR TRAFFIC

4.11.1 Environmental Setting

Pismo Beach is an elongated, highway-oriented community. The city sits astride the four-lane U.S. Highway 101 freeway corridor. Highway 101 is a major interstate connector that provides a linkage between northern and southern California. Highway 1 runs parallel to Highway 101 in the southern part of Pismo Beach. Highway 1 passes through the middle of downtown Pismo Beach and connects with Highway 101 just north of Bay Street. Average Daily Traffic on Highway 101 and Highway 1 within the Project area are shown in Table 4-30.

Table 4-30: Annual Average Daily Traffic for Highways 101 and 1 Within the Project Area

Project Site	Nearest Documented Traffic Counts (Caltrans) Between		2006 Annual Average Daily Traffic (AADT)	2007 AADT	2008 AADT
St. Andrews Lift Station	Hwy 101 and Shell Beach Interchange North	Hwy 101 and Hwy 1 JCT South	66,000	67,000	67,000
Vista del Mar Lift Station					
Ocean Park					
Price Street - North					
Price Street - South					
Cypress Street Lift Station	Hwy 101 and Hwy 1 JCT South	Hwy 101 and Villa Creek	60,000	61,000	62,000
	Hwy 1 and Hwy 101 JCT South	Hwy 1 and Villa Creek	13,500	13,500	10,400

Source: California Department of Transportation Traffic Volumes on the California State Highway System (http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/, website accessed December 2009)

Price Street, which runs parallel to Highway 101, is a major city arterial surface street that connects the downtown area with Shell Beach and outlying areas. It changes name to Shell Beach Road in Shell Beach.

4.11.2 Environmental Consequences

4.11.2.1 Significance Criteria

A significant impact would occur if the proposed Project results in:

- inadequate parking facilities;
- an inadequate access or onsite circulation system; or
- the creation of hazardous traffic conditions.

4.11.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

During the three-month construction period for the rock revetment, the staging area will extend onto Seacliff Drive. The staging area will temporarily eliminate street parking for about six cars.

Parking would be available elsewhere along Seacliff Drive and adjacent streets. The temporary elimination of about six parking spaces would be an insignificant impact.

The staging area at the St. Andrews Lift Station site would extend out to about half the width of Seacliff Drive at the site. Vehicles would still be able to use the roadway, although they might experience some delays. The impacts of the staging area on circulation would be insignificant.

Construction of the revetment at the St. Andrews Lift Station site would require 180 truck trips to deliver the rock for the revetment. These truck trips would occur over a period of 6 days with an average of 30 truck trips per day. Figure 4-26 shows the likely truck route. Trucks would exit Highway 101 at Shell Beach Rd. and Seacliff Drive and proceed down Seacliff Drive to the site. They would return via Naomi Avenue and Coburn Lane. The Average Annual Daily Traffic (AADT) for Highway 101 in this area is 67,000 vehicles. Therefore, 30 truck trips per day represent 0.04 percent of the average traffic and would be an insignificant impact to Highway 101.

In addition to adding traffic to Highway 101, truck trips also would add traffic to Seacliff Drive, Naomi Avenue, and Coburn Lane. Truck traffic would occur during the day. An addition of two to three trucks trips per hour during the daytime on these streets for six days would not constitute a substantial increase in traffic and would not impair circulation in the area. The impacts to traffic would be insignificant.

Because the staging area would extend out for half the width of Seacliff Drive, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by the following measure:

- Signs and persons to direct traffic shall be placed on Seacliff Drive at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s).

When construction is completed, the presence of the revetment on the beach will have no impact on traffic.

<u>Alternative 2: Vertical Sea Wall</u>

The impacts of the construction staging area for construction of a vertical sea wall on traffic safety and circulation at the St. Andrews Lift Station site would be the same as for the rock revetment, but construction would occur for four months rather than three months. The impacts of the staging area on parking would be insignificant. Because the staging area would extend out for half the width of Seacliff Drive, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by implementing the measure described for the rock revetment alternative at this site.

The delivery of materials for construction of the vertical sea wall would require 40 truck trips to deliver rocks, 80 truck trips to deliver concrete, and 30 truck trips to deliver soil for a total of 150 truck trips over 5 days, or an average of 30 truck trips per day. Thirty truck trips per day would have an insignificant impact on circulation.

When the vertical sea wall construction is completed, the presence of the sea wall on the beach would have no impact on traffic.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts of the construction staging area of the concrete/shotcrete wall on parking and traffic safety would be the same as for construction of the rock revetment and the vertical sea wall, except that construction of the sculpted concrete/shotcrete would take five months. The impacts to parking would be insignificant. Because the staging area would extend out for half the width of Seacliff Drive, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by implementing the measure described for the rock revetment alternative for this site.

The delivery of materials for construction of the sculpted concrete/shotcrete wall would require 40 truck trips to deliver rocks, 90 truck trips to deliver concrete and 30 truck trips to deliver soil for a total of 160 trips over 6 days, or an average of about 27 trips per day. Twenty-seven truck trips per day would have an insignificant impact on circulation.

When construction of the sculpted concrete/shotcrete wall is completed, the presence of the wall on the bluffs will have no impact on traffic.

No Action Alternative

The No Action alternative would avoid the temporary impacts to parking and traffic from construction of a revetment or sea wall at the St. Andrews Lift Station site; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Seacliff Drive might eventually be lost resulting, in a loss of parking spaces and loss of the street for circulation.

4.11.2.3 Vista del Mar Lift Station

Alternative 1: Rock Revetment

During the three-month construction period for the rock revetment, the staging area will extend onto Ocean Boulevard. The staging area temporarily will eliminate street parking for about 12 cars. Parking would be available elsewhere along Ocean Boulevard and adjacent streets. The temporary elimination of about 12 parking spaces would be an insignificant impact.

The staging area at the Vista del Mar Lift Station site would extend out to about half the width of Ocean Boulevard at the site. Vehicles would still be able to use the roadway, although they might experience some delays. The impacts of the staging area on circulation would be insignificant.

Construction of the revetment at the Vista del Mar Lift Station site would require 200 truck trips to deliver the rock for the revetment. These truck trips would occur over a period of 7 days with an average of about 29 truck trips per day. Figure 4-27 shows the likely truck route. Trucks would exit Highway 101 at Shell Beach Road and Seacliff Drive and proceed down Shell Beach Road to Vista del Mar Avenue and down Vista del Mar Avenue to Ocean Boulevard and the site. Trucks would return via Ocean Boulevard to Wanona Avenue to Shell Beach Road. The AADT

for Highway 101 in this area is 67,000 vehicles. Therefore, 29 truck trips per day represent 0.04 percent of the average traffic and would be insignificant.

In addition to adding traffic to Highway 101, truck trips also would add traffic to Shell Beach Road, Vista del Mar Avenue, Ocean Boulevard, and Wanona Avenue. Truck traffic would occur during the day. An addition of two to three truck trips per hour during the daytime on these streets for seven days would not constitute a substantial increase in traffic and would not impair circulation in the area. The impacts to traffic would be insignificant.

Because the staging area would extend out for half the width of Ocean Boulevard, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by the following measure:

- Signs and persons to direct traffic shall be placed on Ocean Boulevard at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s).

When construction is completed, the presence of the revetment on the beach will have no impact on traffic.

Alternative 2: Vertical Sea Wall

The impacts of the construction staging area for construction of a vertical sea wall on traffic safety and circulation at the Vista del Mar site would be the same as for the rock revetment, but construction would occur for four months rather than three months. The impacts of the staging area on parking would be insignificant. Because the staging area would extend out for half the width of Ocean Boulevard, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by implementing the measure described for the revetment alternative.

The delivery of materials for construction of the vertical sea wall would require 50 truck trips to deliver rocks, 50 truck trips to deliver concrete, and 30 truck trips to deliver soil for a total of 130 truck trips over 5 days, or an average of 26 truck trips per day. Twenty-six truck trips per day would have an insignificant impact on circulation.

When sea wall construction is completed, the presence of the sea wall on the beach would have no impact on traffic.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts of the construction staging area of the concrete/shotcrete wall on parking and traffic safety would be the same as for construction of the rock revetment and the vertical sea wall, except that construction of the sculpted concrete /shotcrete would take five months. The impacts to parking would be insignificant. Because the staging area would extend out for half the width of Ocean Boulevard, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by implementing the measure described for the revetment alternative.

The delivery of materials for construction of the sculpted concrete/shotcrete wall would require 50 truck trips to deliver rocks, 60 truck trips to deliver concrete, and 30 truck trips to deliver soil for a total of 140 truck trips over 5 days, or an average of 28 truck trips per day. Twenty-eight truck trips per day would have an insignificant impact on circulation.

When construction of the sculpted concrete/shotcrete wall is completed, the presence of the wall on the bluffs will have no impact on traffic.

No Action Alternative

The No Action alternative would avoid the temporary impacts to parking and traffic of construction of a revetment or sea wall at the Vista del Mar Lift Station site; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Ocean Boulevard might eventually be lost, resulting in a loss of parking spaces and loss of the street for circulation.

4.11.2.4 Ocean Park

Alternative 1: Rock Revetment

During the three-month construction period for the rock revetment, the staging area will extend onto Ocean Boulevard. The staging area will temporarily eliminate street parking for about 16 cars. Parking would be available elsewhere along Ocean Boulevard and adjacent streets. The temporary elimination of about 16 parking spaces would be an insignificant impact.

The staging area at the Ocean Park site would extend out to about half the width of Ocean Boulevard at the site. Vehicles would still be able to use the roadway, although they might experience some delays. The impacts of the staging area on circulation would be insignificant.

Construction of the revetment at the Ocean Park site would require 250 truck trips to deliver the rock for the revetment. These truck trips would occur over a period of 9 days with an average of about 28 truck trips per day. Figure 4-27 shows the likely truck route. Trucks would exit Highway 101 at Shell Beach Road and Seacliff Drive and proceed down Shell Beach Road to Vista del Mar Avenue and down Vista del Mar Avenue to Ocean Boulevard and the site. Trucks would return via Ocean Boulevard to Wanona Avenue to Shell Beach Road. The AADT for Highway 101 in this area is 67,000 vehicles. Therefore, 28 truck trips per day represent 0.04 percent of the average traffic and would be an insignificant impact to traffic on Highway 101.

In addition to adding traffic to Highway 101, truck trips also would add traffic to Shell Beach Road, Vista del Mar Avenue, Ocean Boulevard, and Wanona Avenue. Truck traffic would occur during the day. An addition of two to three truck trips per hour during the daytime on these streets for nine days would not constitute a substantial increase in traffic and would not impair circulation in the area. The impacts to traffic would be insignificant.

Because the staging area would extend out for half the width of Ocean Boulevard, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by the following measure:

- Signs and persons to direct traffic shall be placed on Ocean Boulevard at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s).

When construction is completed, the presence of the revetment on the beach will have no impact on traffic.

Alternative 2: Vertical Sea Wall

The impacts of the construction staging area for construction of a vertical sea wall on traffic safety and circulation at the Ocean Park site would be the same as for the rock revetment, but construction would occur for four months rather than three months. The impacts of the staging area on parking would be insignificant. Because the staging area would extend out for half the width of Ocean Boulevard, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by implementing the measure described for the rock revetment alternative for this site.

The delivery of materials for construction of the vertical sea wall would require 60 truck trips to deliver rocks, 70 truck trips to deliver concrete, and 40 truck trips to deliver soil for a total of 170 truck trips over 6 days, or an average of about 28 truck trips per day. Twenty-eight truck trips per day would have an insignificant impact on circulation.

When sea wall construction is completed, the presence of the sea wall on the beach would have no impact on traffic.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts of the construction staging area of the concrete/shotcrete wall on parking and traffic safety would be the same as for construction of the rock revetment and the vertical sea wall, except that construction of the sculpted concrete /shotcrete would take five months. The impacts to parking would be insignificant. Because the staging area would extend out for half the width of Ocean Boulevard, a potentially hazardous condition would be created for vehicles coming in opposite directions in the remaining lanes. This impact can be mitigated to insignificant by implementing the measure described for the rock revetment alternative for this site.

The delivery of materials for construction of the sculpted concrete/shotcrete wall would require 60 truck trips to deliver rocks, 80 truck trips to deliver concrete, and 40 truck trips to deliver soil for a total of 180 truck trips over 6 days, or an average of 30 truck trips per day. Thirty truck trips per day would have an insignificant impact on circulation.

When construction of the sculpted concrete/shotcrete wall is completed, the presence of the wall on the bluffs will have no impact on traffic.

No Action Alternative

The No Action alternative would avoid the temporary impacts to parking and traffic of construction of a revetment or sea wall at the Ocean Park site; however, under the No Action

alternative, the bluffs at the site would continue to erode. Some or all of Ocean Boulevard might eventually be lost, resulting in a loss of parking spaces and a loss of the street for circulation.

4.11.2.5 Price Street – North

Alternative 1: Rock Revetment

The staging area at the Price Street - North site would not occupy any parking spaces. Therefore, construction at this site would have no impact on parking.

Construction of the revetment at the Price Street - North site would require 420 truck trips to deliver the rock for the revetment. These truck trips would occur over a period of 14 days with an average of about 30 truck trips per day. Figure 4-28 shows the likely truck route. Trucks would exit Highway 101 at Price Street and head north to the site. They would return via Price Street to the on-ramp to Highway 101 at Price Street and Foothill Road. The AADT for Highway 101 in this area is 62,000 vehicles. Therefore, 30 truck trips per day represent 0.05 percent of the average traffic and would be insignificant.

In addition to adding traffic to Highway 101, truck trips also would add traffic to Price Street. Truck traffic would occur during the day. An addition of 2 to 3 truck trips per hour during the daytime on Price Street for 14 days would not constitute a substantial increase in traffic and would not impair circulation in the area. The impacts to traffic would be insignificant.

Because the staging area would extend out for half the width of Price Street at all times and the entire width at other times, a potentially hazardous condition would be created for vehicles. When half the width of Price Street is occupied, vehicles would need to be safely directed around the staging area. When all of Price Street is occupied, vehicles would need to be stopped and sent back to the detour. This impact can be mitigated to insignificant by the following measures:

- Signs and persons to direct traffic shall be placed on Price Street at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s) or safely turn around and proceed to the detour.
- Signs and notices shall be posted warning of the dates and times that Price Street will be closed. The notices shall include identification of alternate routes.

When construction is completed, the presence of the revetment on the beach will have no impact on traffic.

Alternative 2: Vertical Sea Wall

The impacts of the construction staging area for construction of a vertical sea wall on traffic safety and circulation at the Price Street - North site would be the same as for the rock revetment, but construction would occur for seven months rather than five months. The impact of the staging area on circulation and traffic safety on Price Street can be mitigated to insignificant by implementing the two measures described for the rock revetment alternative for this site.

The delivery of materials for construction of the vertical sea wall would require 90 truck trips to deliver rocks, 220 truck trips to deliver concrete, and 70 truck trips to deliver soil for a total of 380 trips over 12 days, or an average of about 32 truck trips per day. Thirty-two truck trips per day would have an insignificant impact on circulation.

When sea wall construction is completed, the presence of the sea wall on the beach would have no impact on traffic.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts of the construction staging area of the concrete/shotcrete wall on traffic safety and circulation would be the same as for construction of the rock revetment and the vertical sea wall, except that construction of the sculpted concrete /shotcrete would take eight months. The impact of the staging area on circulation and traffic safety on Price Street can be mitigated to insignificant by implementing the two measures described for the rock revetment alternative for this site.

The delivery of materials for construction of the sculpted concrete/shotcrete wall would require 90 truck trips to deliver rocks, 230 truck trips to deliver concrete, and 70 truck trips to deliver soil for a total of 390 truck trips over 12 days, or an average of about 33 truck trips per day. Thirty-three truck trips per day would have an insignificant impact on circulation

When construction of the sculpted concrete/shotcrete wall is completed, the presence of the wall on the bluffs will have no impact on traffic.

No Action Alternative

The No Action alternative would avoid the temporary impacts to traffic of construction of a revetment or sea wall at the Price Street - North site; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Price Street might eventually be lost, resulting in loss of a major street providing access between the northern and southern portions of Pismo Beach.

4.11.2.6 Price Street – South

Alternative 1: Rock Revetment

The staging area at the Price Street - South site might occupy as many as eight parking spaces during the five-month construction period. There are over 60 parking spaces in the vicinity of the site. Temporary removal of less than 15 percent of the parking would be an insignificant impact.

Construction of the revetment at the Price Street - South site would require 260 truck trips to deliver the rock for the revetment. These truck trips would occur over a period of 9 days with an average of about 29 truck trips per day. Figure 4-28 shows the likely truck route. Trucks would exit Highway 101 at Price Street and head north to the site. They would return via Price Street to the on-ramp to Highway 101 at Price Street and Foothill Road. The AADT for Highway 101 in this area is 62,000 vehicles. Therefore, 29 truck trips per day represent about 0.05 percent of the average traffic and would be insignificant.

In addition to adding traffic to Highway 101, truck trips also would add traffic to Price Street. Truck traffic would occur during the day. An addition of two to three trucks per hour during the daytime on Price Street for nine days would not constitute a substantial increase in traffic and would not impair circulation in the area. The impacts to traffic would be insignificant.

Because the staging area would extend out for half the width of Price Street at all times and the entire width at other times, a potentially hazardous condition would be created for vehicles. When half the width of Price Street is occupied, vehicles would need to be safely directed around the staging area. When all of Price Street is occupied, vehicles would need to be stopped and sent back to the detour. This impact can be mitigated to insignificant by the following measures:

- Signs and persons to direct traffic shall be placed on Price Street at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s) or safely turn around and proceed to the detour.
- Signs and notices shall be posted warning of the dates and times that Price Street will be closed. The notices shall include identification of alternate routes.

When construction is completed, the presence of the revetment on the beach will have no impact on traffic.

Alternative 2: Vertical Sea Wall

The impacts of the construction staging area for construction of a vertical sea wall on traffic safety and circulation at the Price Street - South site would be the same as for the rock revetment, but construction would occur for seven months rather than five months. The impact of the staging area on parking, circulation, and traffic safety on Price Street can be mitigated to insignificant by implementing the two measures described for the rock revetment alternative for this site.

The delivery of materials for construction of the vertical sea wall would require 60 truck trips to deliver rocks, 130 truck trips to deliver concrete, and 70 truck trips to deliver soil for a total of 260 truck trips over 9 days or an average of about 29 truck trips per day. Twenty-nine truck trips per day would have an insignificant impact on circulation.

When sea wall construction is completed, the presence of the sea wall on the beach would have no impact on traffic.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts of the construction staging area of the concrete/shotcrete wall on traffic safety and circulation would be the same as for construction of the rock revetment and the vertical sea wall, except that construction of the sculpted concrete /shotcrete would take eight months. The impact of the staging area on parking, circulation, and traffic safety on Price Street can be mitigated to insignificant by implementing the two measures described for the rock revetment alternative for this site.

The delivery of materials for construction of the sculpted concrete/shotcrete wall would require 60 truck trips to deliver rocks, 150 truck trips to deliver concrete, and 70 truck trips to deliver soil for a total of 280 truck trips over 9 days, or an average of about 31 truck trips per day. Thirty-one truck trips per day would have an insignificant impact on circulation

When construction of the sculpted concrete/shotcrete wall is completed, the presence of the wall on the bluffs will have no impact on traffic.

No Action Alternative

The No Action alternative would avoid the temporary impacts to traffic of construction of a revetment or sea wall at the Price Street - South site; however, under the No Action alternative, the bluffs at the site would continue to erode. Some or all of Price Street might eventually be lost, resulting in loss of a major street providing access between the northern and southern portions of Pismo Beach.

4.11.2.7 Cypress Street Lift Station

Alternative 1: Rock Revetment

The staging area for the Cypress Street Lift Station site will be beyond the dead end of Cypress Street. The staging area will not occupy any parking places or obstruct traffic.

Construction of the revetment at the Cypress Street Lift Station site would require 1,040 truck trips to deliver the rock for the revetment and 280 truck trips to deliver concrete for a total of 1,320 truck trips. These truck trips would occur over a period of 42 days with an average of about 31 truck trips per day. Figure 4-29 shows the likely truck route. Trucks would exit Highway 101 at the Highway 1 off-ramp and take Price Street south to Wadsworth Avenue. The trucks would take Wordsworth Avenue south to Cypress Street and Cypress Street to the site. Trucks would return by taking San Luis Street to Highway 1 south to Wadsworth Avenue and Wadsworth north to Price Street. The AADT for Highway 101 in this area is 62,000 vehicles. Therefore, 29 truck trips per day represent about 0.05 percent of the average traffic. The AADT on Highway 1 in this area is 10,400 vehicles. Approximately 29 truck trips per day would represent about 0.3 percent of the daily traffic on Highway 1. The impacts of truck traffic on circulation would be insignificant.

In addition to adding traffic to Highway 101, truck trips also would add traffic to Price Street, Wadsworth Avenue, Cypress Street, and San Luis Street. Truck traffic would occur during the day. An addition of 2 to 3 truck trips per hour during the daytime on these streets for 42 days would not constitute a substantial increase in traffic and would not impair circulation in the area. The impacts to traffic would be insignificant.

Alternative 4: Steel Sheet Pile Wall

The staging area for construction of a steel sheet pile wall at Cypress Street Lift Station would be the same as for construction of a rock revetment. The staging area would not affect parking, circulation, or vehicle safety.

The haul route for the trucks would be the same as for revetment construction. Construction of the vertical sheet pile wall at the Cypress Street Lift Station site would require 220 truck trips to deliver rock, 280 truck trips to deliver concrete, and 20 truck trips to deliver soil for a total of 520 truck trips. These truck trips would occur over a period of 15 days with an average of about 35 truck trips per day. Thirty-five truck trips per day would represent about 0.06 percent of the average traffic on Highway 101 in this area and 0.3 percent of the daily traffic on Highway 1. The impacts to circulation would be insignificant.

No Action Alternative

The No Action alternative would avoid the temporary impacts to traffic of construction of a rock revetment or steel sheet pile wall at the Cypress Street Lift Station site. Bluff erosion might eventually affect the end of Cypress Street with some loss of parking and circulation.

4.12 VESSEL TRAFFIC

4.12.1 Environmental Setting

Vessel traffic within the nearshore waters of the Project area generally consists of small recreational and commercial vessels. Port San Luis in San Luis Obispo Bay, about two miles north of the Project area, and Morro Bay Harbor, farther north, are the primary boat harbors for boats that access the Pismo Beach coastline. Recreational boating activities in the Project area include fishing, diving, whale and other marine wildlife watching, and kayaking. Kayaks may be launched from the beach near the Cypress Street Lift Station site. Commercial whale watching and sportsfishing vessels also use the nearshore waters of the Project area.

4.12.2 Environmental Consequences

4.12.2.1 Significance Criteria

Vessel safety impacts will be considered significant if construction activities create a navigation hazard, interfere with any emergency response or evacuation plans, or result in unsafe conditions for vessel traffic.

4.12.2.2 St. Andrews Lift Station

Alternatives 1, 2, and 3

None of the action alternatives involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

No Action Alternative

The No Action alternative does not involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

4.12.2.3 Vista del Mar Lift Station

Alternatives 1, 2, and 3

None of the action alternatives involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

No Action Alternative

The No Action alternative does not involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

4.12.2.4 Price Street – North

Alternatives 1, 2, and 3

None of the action alternatives involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

No Action Alternative

The No Action alternative does not involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

4.12.2.5 Price Street – South

Alternatives 1, 2, and 3

None of the action alternatives involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur..

No Action Alternative

The No Action alternative does not involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

4.12.2.6 Cypress Street Lift Station

Alternatives 1 and 4

None of the action alternatives involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

No Action Alternative

The No Action alternative does not involve performing any work or constructing any structures below mean sea level. No impacts on vessel traffic would occur.

4.13 UTILITIES

4.13.1 Environmental Setting

Numerous utilities, including sewer lines, lift stations, water lines, gas lines, oil lines, and electrical lines occur in close proximity to the Project sites. Figure 4-10 to Figure 4-15 show the utilities near each of the sites. These utilities are described below.

St. Andrews Lift Station (Figure 4-10) – The St. Andrews Lift Station is located along the edge of the bluffs at the foot of Baker Avenue. A 6-inch sewer line runs from the lift station up Baker Avenue. A 6-inch sewer main line extends along Seacliff Drive. A 6-inch water main line also extends along Seacliff Drive with lines up Paddock Avenue and Baker Avenue.

Vista del Mar Lift Station (Figure 4-11) – The Vista del Mar lift station is located at the edge of the bluffs at the foot of Vista del Mar Avenue. A 6-inch and an 8-inch sewer force main line extend from the lift station up Vista del Mar Avenue. An 8-inch sewer mainline, a 2-inch gas line, and an 8-inch water main line run within Ocean Boulevard. An electrical service line with a utility pole extends along the edge of the bluffs. Other utilities at the edge of the bluffs at this site include a utility pole, a fire hydrant, a storm drain, and an overflow line from the lift station.

Ocean Park (Figure 4-12) – A sewer main line runs within Ocean Boulevard, about 25 feet from the edge of the bluffs. Sewer main lines also extend up Capistrano Avenue and Wanona Avenue. A corrugated metal pipe drain runs across Ocean Boulevard. A 2-inch gas main extends from the seaward side of Ocean Boulevard up Capistrano Avenue.

Price Street - North (Figure 4-13) - Two oil lines and an electrical line are located about 15 to 20 feet from the bluff edge at the Price Street - North site. A gas main line and a sewer force main line are located within the Price Street right-of-way. An 18-inch water line is located on the far side of Price Street, and a 12 inch sewer force main line is located within Price Street.

Price Street - South (Figure 4-14) – Several utility lines run right along the edge of the cliffs at the Price Street - South site. These include a gas main line, a water line, and an 8- and a 12–inch oil line. A 42-inch corrugated metal pipe drains water off the edge of the bluffs. Several utility poles are also located along the bluffs at this site. An 18-inch water line is located on the far side of Price Street, and a 12-inch sewer force main line is located within Price Street.

Cypress Street Lift Station (Figure 4-15) - The Cypress Street Lift Station is located at the intersection of Harloe Avenue and Cypress Street, approximately 31 feet from the edge of the cliff. Sewer lines connect to the lift station and extend up Harloe Avenue. A 10-inch water line also runs up Harloe Avenue. Sewer and water lines are located along Cypress Street. The sewer line is about 16 feet from the edge of the bluff, and the water line is about 25 feet from the cliff edge. Associated utility features near the site include sewer manhole covers and water valves, including a water valve and water main near the cliff edge south of Wadsworth Avenue.

Figure 4-10:
Utilities Near St. Andrews Lift Station

Figure 4-11:
Utilities Near Vista del Mar Lift Station

Figure 4-12:
Utilities Near Ocean Park

Figure 4-13:
Utilities Near Price Street - North

Figure 4-14:
Utilities Near Price Street - South

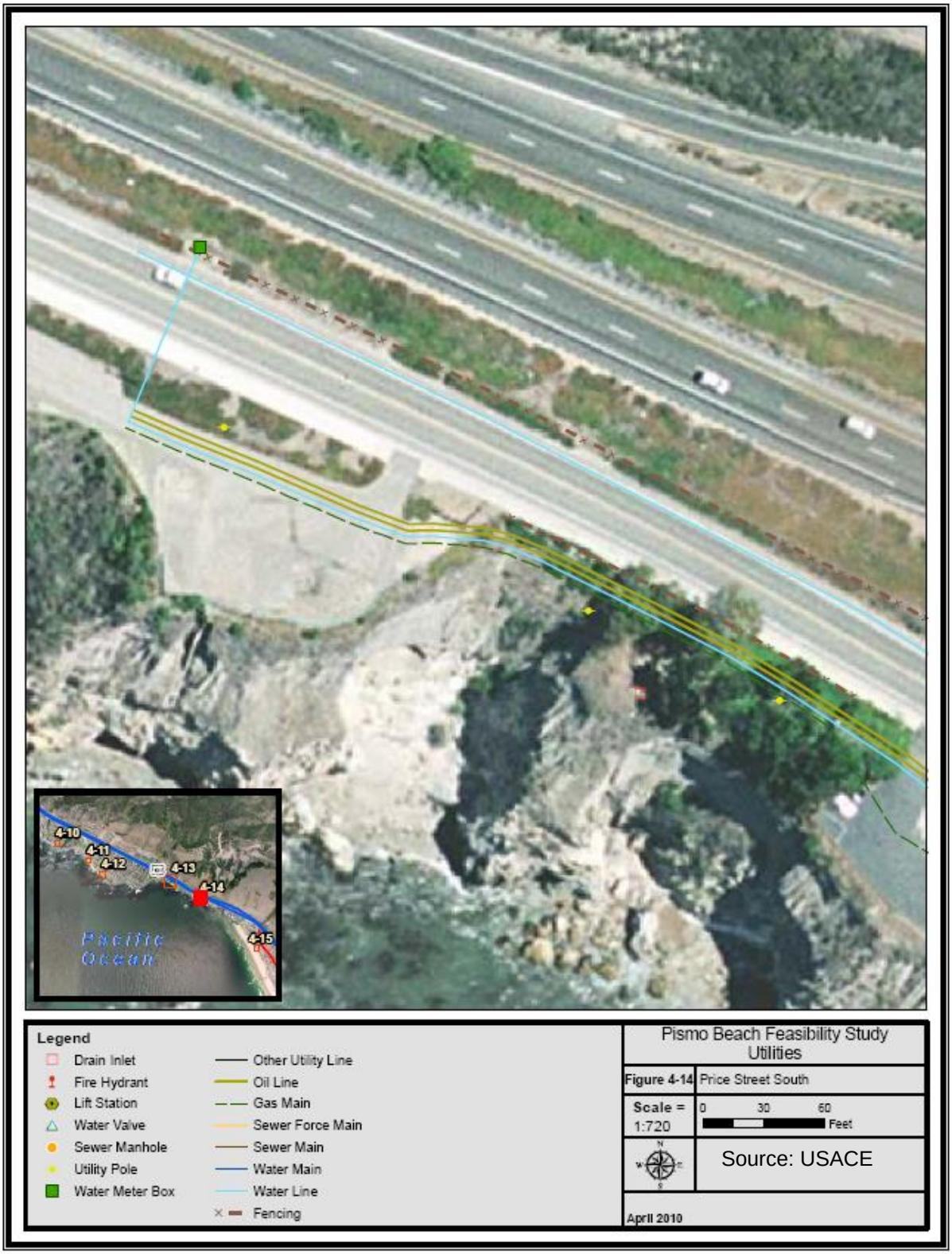
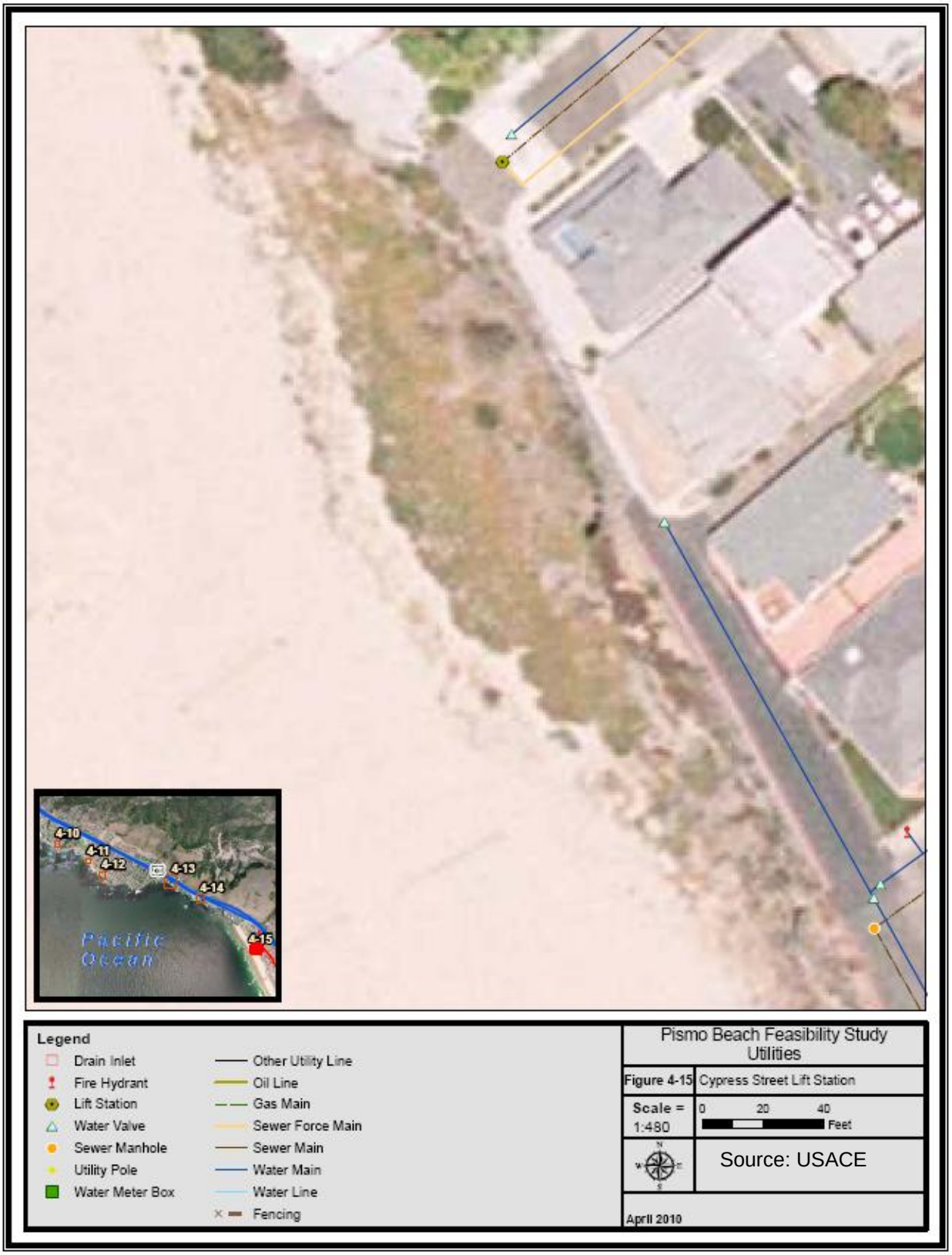


Figure 4-15:
Utilities Near Cypress Street Lift Station



4.13.2 Environmental Consequences

4.13.2.1 Significance Criteria

Significant impacts to public utilities would occur if any of the alternatives result in:

- substantial and long term interruption of utility service; or
- substantial alteration to existing public utilities.

4.13.2.2 St. Andrews Lift Station

Alternatives 1, 2, and 3

Construction at the St. Andrews Lift Station site would not result in substantial interruption of utility service or alteration to existing public utilities. Construction of a bluff protection structure at this site would help to reduce bluff erosion, which threatens the lift station and sewer main line, as well as potentially the water main line.

No Action Alternative

Under the No Action alternative, bluff erosion would continue at the St. Andrews Lift Station site. The lift station probably will be lost to erosion. The sewer mainline, which runs along Seacliff Drive, also is in danger. The water main line, which is further from the bluff than the sewer main line, also may be lost if erosion continues at this site.

4.13.2.3 Vista del Mar Lift Station

Alternatives 1, 2, and 3

Construction at the Vista del Mar Lift Station site would not result in substantial interruption of utility service or alteration to existing public utilities. Construction of a bluff protection structure at this site would help to reduce bluff erosion, which threatens the lift station, a sewer main line, an electrical line, and a fire hydrant, as well as potentially a water main line and a gas line.

No Action Alternative

Under the No Action alternative, bluff erosion would continue at the Vista del Mar Lift Station site. The lift station probably will be lost to erosion. The sewer mainline, which runs along Ocean Boulevard, also is in danger. An electrical line, utility pole, and fire hydrant, both of which are close to the bluff edge, also are in danger from erosion. The water main line and the gas line, which are further from the bluff than the sewer main line, also may be lost if erosion continues at this site.

4.13.2.4 Ocean Park

Alternatives 1, 2, and 3

Construction at the Ocean Park site would not result in substantial interruption of utility service or alteration to existing public utilities. Construction of a bluff protection structure at this site would help to reduce bluff erosion, which threatens the sewer main line, as well as potentially the water main line and a gas line.

No Action Alternative

Under the No Action alternative, bluff erosion would continue at the Ocean Park site. The sewer main line, which runs within Ocean Boulevard is in danger from erosion. The water main line and gas main line, which are further from the bluff than the sewer main line, also may be lost if erosion continues at this site.

4.13.2.5 Price Street – North

Alternatives 1, 2, and 3

During construction at the Price Street - North site, overhead electrical lines may need to be re-routed temporarily to avoid interference with operation of the crane on the bluff top. While the electrical lines are being re-routed, electrical service may be interrupted temporarily for 8 to 10 hours first to remove and then second to restore overhead lines. The lines would be returned to their original configuration when construction is finished. Temporary re-location of overhead electrical lines would not be a substantial long-term interruption of utility service or a substantial alteration of a public utility. However, to minimize the adverse impacts of a temporary interruption of service, the following measure shall be implemented.

- The construction contractor shall inform all parties that would be affected by the interruption in electrical service of the date and time that electrical service would be interrupted. The contractor shall work with affected parties to minimize duration of the interruption and any problems that may be caused by the interruption.

Construction of a bluff protection structure at the Price Street - North site would stabilize the bluffs and help protect bluff-top utilities from damage. Oil lines and electrical lines are located along the bluff tops at this site.

No Action Alternative

Under the No Action alternative, erosion of the bluffs at the Price Street - North site would continue. The two oil lines and the electrical line, which are located 15 to 20 feet from the edge of the bluffs, are extremely vulnerable to damage or loss from erosion. If erosion continues, eventually the gas main line, the sewer force main line, and the water line located in the Price Street right-of-way may be lost or damaged.

4.13.2.6 Price Street – South

Alternatives 1, 2, and 3

During construction at the Price Street - South site, overhead electrical lines may need to be re-routed temporarily to avoid interference with operation of the crane on the bluff top. While the electrical lines are being re-routed, electrical service may be interrupted temporarily for 8 to 10 hours, first to remove and then second to restore overhead lines. The lines would be returned to their original configuration when construction is finished. Temporary relocation of overhead electrical lines would not be a substantial long-term interruption of utility service or a substantial alteration of a public utility. However, to minimize the adverse impacts of a temporary interruption of service, the measure identified for Alternatives 1, 2, and 3 for the Price Street – North site shall be implemented.

Construction of a bluff protection structure at the Price Street - South site would stabilize the bluffs and help protect bluff-top utilities from damage. A gas main line, a water line, oil lines, and utility poles are located on the edge of the bluffs at this site.

No Action Alternative

Under the No Action alternative, erosion of the bluffs at the Price Street - South site would continue. The two oil lines, a gas main line, and a water line, which are located at the edge of the bluffs, are extremely vulnerable to damage or loss from erosion. If erosion continues, eventually the water line located in the Price Street right-of-way may be lost or damaged.

4.13.2.7 Cypress Street Lift Station

Alternatives 1 and 4

During construction at the Cypress Street Lift Station site, overhead electrical lines may need to be re-routed temporarily to avoid interference with operation of the crane on the bluff top. While the electrical lines are being re-routed, electrical service may be interrupted temporarily for 8 to 10 hours, first to remove and then second to restore overhead lines. The lines would be returned to their original configuration when construction is finished. Temporary relocation of overhead electrical lines would not be a substantial long-term interruption of utility service or a substantial alteration of a public utility. However, to minimize the adverse impacts of a temporary interruption of service, the measure identified for Alternatives 1, 2, and 3 for the Price Street – North site shall be implemented.

Construction of a bluff protection structure at the Cypress Street Lift Station site would stabilize the bluffs and help protect bluff top utilities from damage. The Cypress Street Lift Station is in danger of loss or damage from erosion. Other utilities very close to the bluff top at this site include a sewer and water lines.

No Action Alternative

Under the No Action alternative, bluff erosion would continue at the Cypress Street Lift Station site. The lift station, as well as the bluff-top sewer and water lines, are in danger of being damaged or lost from continued bluff erosion.

4.14 AESTHETICS

4.14.1 Environmental Setting

The Project area provides visually pleasing views of the ocean from the beach and bluffs. At the southernmost site, the Cypress Street Lift Station, the view is of sandy beach. All the other sites provide views of rocky intertidal, offshore rocks and kelp beds. These northern sites provide excellent opportunities for viewing birds and wildlife, including sea otters, harbor seals, dolphins, roosting pelicans, cormorants, gulls, and shorebirds, such as black oystercatchers. Figure 4-16 through Figure 4-21 show views from each of the Project sites.

4.14.2 Environmental Consequences

Significance Criteria

The Project would significantly impact the aesthetics if a landscape were changed in a manner that permanently and significantly degrades an existing viewshed or alters the character of a viewshed by adding incompatible structures

4.14.2.1 St. Andrews Lift Station

Alternative 1: Rock Revetment

During construction of the rock revetment at the St. Andrews Lift Station, the presence of the crane on the bluffs and construction equipment on the bluffs and beach will temporarily degrade the view. When revetment construction is completed in three months, all equipment would be removed. The presence of construction equipment would have an insignificant impact on aesthetics.

The rock revetment would be a man-made structure in a natural setting. The revetment would degrade the view of the beach but would not affect the offshore seascape of kelp beds and rocks. The bluff erosion at the St. Andrews Lift Station site has resulted in unpleasant views of exposed pipes and rubble on the beach. In addition, a sea wall is currently located on the site. The presence of the revetment would not substantially alter the existing landscape or add an incompatible structure compared to the rubble, pipes, and sea wall of the existing condition. The impact of a rock revetment on aesthetics would be insignificant.

Figure 4-16:
Views at St. Andrews Lift Station

Photo 11: Photo taken looking southeast from the top of the bluffs of the St. Andrews Lift Station site. Seacliff Drive is behind.

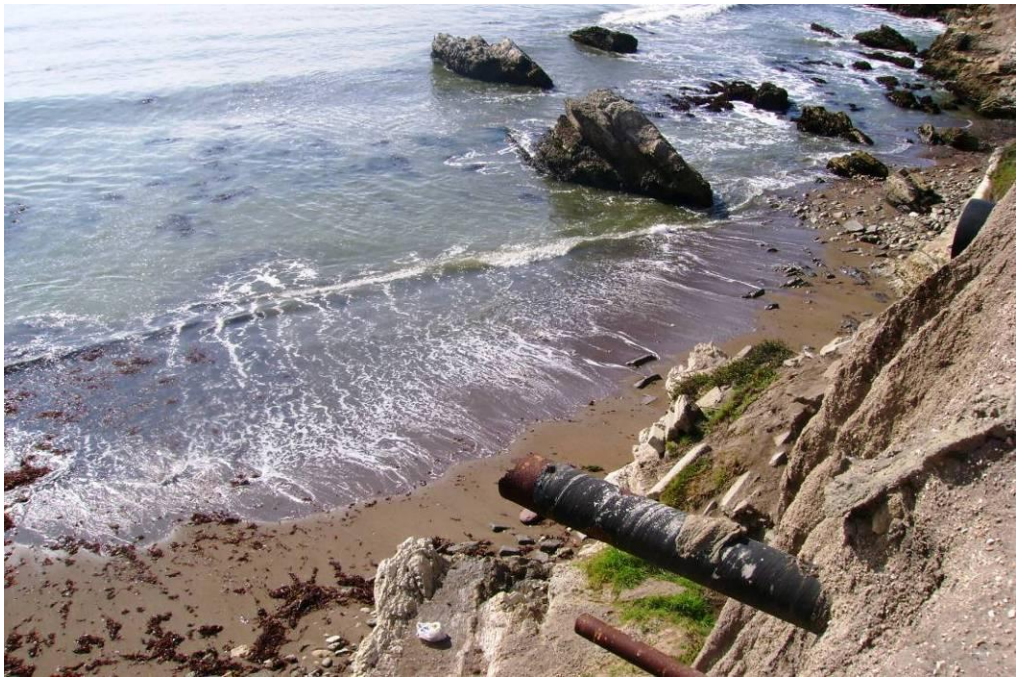


Photo 12: Photo taken looking southwest from the top of the bluffs of the St. Andrews Lift Station site.

Figure 4-17:
Views at Vista del Mar Lift Station

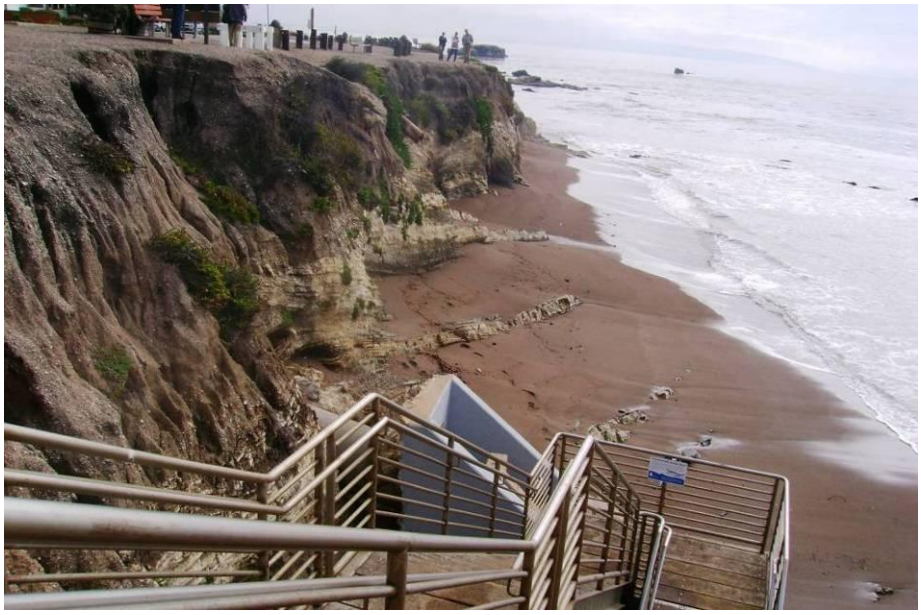


Photo 9: Photo taken looking south from the top of the stairs on the upcoast side of Vista del Mar Lift Station site. Ocean Boulevard is shown at the top left of the photo.

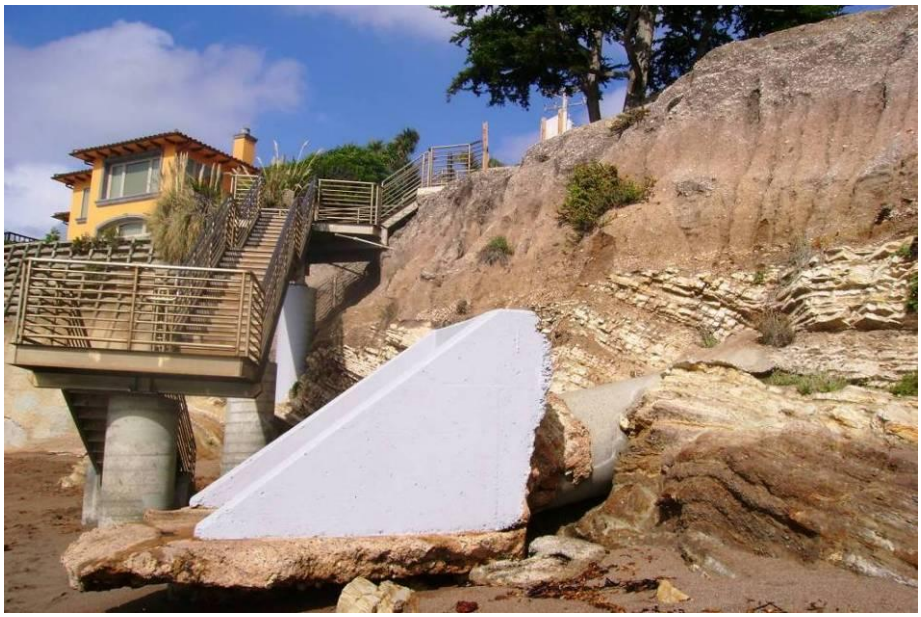


Photo 10: Photo taken looking north at the bluff erosion from the beach at the bottom of the bluffs of the Vista del Mar Lift Station site. The lift station is situated at the top of the staircase.

Figure 4-18:
Views at Ocean Park

Photo 7: Photo taken looking southeast from top of bluff on the upcoast side of Ocean Park site. Existing bluff erosion is at the edge of Price Street, and fencing has been constructed onto Price Street.

Photo 8: Photo taken looking northwest from the top of the bluff on Price Street midway along the Ocean Park site.

Figure 4-19:
Views at Price Street - North

Photo 5: Photo taken looking northwest from top of bluff on the downcoast side of Price Street - North site.

Photo 6: Photo taken looking north at the bluffs from the beach at the Price Street - North site. The exposed utility pipeline is visible in both Photos 5 and 6.

Figure 4-20:
Views at Price Street - South

Photo 3: Photo taken looking east from top of bluff on the north side of Price Street - South site. Price Street is in the immediate background, and Highway 101 is shown in the far background.

Photo 4: Photo taken looking west at the bluff erosion from the top of the bluff of the Price Street - South site closest to Price Street.

Figure 4-21:
Views at Cypress Street Lift Station

Photo 1: Photo taken looking northwest from top of bluff at the end of Harloe Avenue. Cypress Lift Station is behind.

Photo 2: Photo taken looking north northwest at the bluff erosion at the Cypress Street Lift Station site. The fence in Photo 1 is shown at the top of the bluff next to the house in this photo.

Alternative 2: Vertical Sea Wall

The impacts of construction equipment on aesthetics would be the same as for construction of the rock revetment, but construction would take four months rather than three months. Because the presence of construction equipment is temporary, the impacts to aesthetics would be insignificant.

The vertical sea wall would make the view of the bluffs from the beach less natural than unprotected bluffs; however, a sea wall is currently located at this site, as well as rubble and exposed pipes. Because the sea wall would not extend as far onto the beach as the rock revetment, it would have less of an effect on beach views. The offshore seascape of rocks and kelp would not be affected. The impact of a vertical sea wall on aesthetics would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The temporary impacts of construction equipment on aesthetics would be the same as for a rock revetment or a vertical sea wall, except that construction of a sculpted concrete/shotcrete wall would take five months. The impact of construction equipment on aesthetics would be insignificant.

The sculpted concrete/shotcrete wall would be more aesthetically pleasing than a rock revetment or a vertical sea wall because it would look more like natural bluff. The sculpted concrete/shotcrete wall also would be more aesthetically pleasing than the exposed pipes and rubble of the existing conditions. The impact on aesthetics would be insignificant.

No Action Alternative

Under the No Action alternative, the exposed pipes and rubble that presently degrade the view of the bluff and beach at the St. Andrews Lift Station site would continue. Continuing erosion might result in additional rubble and exposed pipes. In addition, emergency sea walls or revetments might be constructed.

4.14.2.2 Vista del Mar Lift Station

Alternative 1: Rock Revetment

During construction of the rock revetment at the Vista del Mar Lift Station, the presence of the crane and construction equipment on the bluffs and beach will temporarily degrade the view. When revetment construction is completed in three months, all equipment would be removed. The presence of construction equipment would have an insignificant impact on aesthetics.

The rock revetment would be a man-made structure in a natural setting. The revetment would degrade the view of the beach but would not affect the offshore seascape of kelp beds and rocks. The bluff erosion at the Vista del Mar Lift Station site has resulted in unpleasant views of rubble (a detached concrete culvert) on the beach. In addition, an existing sea wall and a staircase to the beach are currently located at the site. The presence of the revetment would not substantially alter the existing landscape or add an incompatible structure compared to the rubble, staircase,

and sea wall of the existing condition. The impact of a rock revetment on aesthetics would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction equipment on aesthetics would be the same as for construction of the rock revetment, but construction would take four months rather than three months. Because the presence of construction equipment is temporary, the impacts to aesthetics would be insignificant.

The vertical sea wall would make the view of the bluffs from the beach less natural than unprotected bluffs; however, a sea wall already exists at this site, as well as rubble and a staircase. Because the sea wall would not extend as far onto the beach as the rock revetment, it would have less of an effect on beach views. The offshore seascape of rocks and kelp would not be affected. The impact of a vertical sea wall on aesthetics would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The temporary impacts of construction equipment on aesthetics would be the same as for a rock revetment or a vertical sea wall, except that construction of a sculpted concrete/shotcrete wall would take five months. The impact of construction equipment on aesthetics would be insignificant.

The sculpted concrete/shotcrete wall would be more aesthetically pleasing than a rock revetment or a vertical sea wall because it would look more like natural bluff. The sculpted concrete/shotcrete wall also would be more aesthetically pleasing than the vertical sea wall and rubble of the existing conditions. The impact on aesthetics would be insignificant.

No Action Alternative

Under the No Action alternative, the rubble that presently degrades the view of the bluff and beach at the Vista del Mar Lift Station site would continue. Continuing erosion might result in additional rubble and damage to the staircase. In addition, emergency sea walls or revetments may be constructed.

4.14.2.3 Ocean Park

Alternative 1: Rock Revetment

During construction, the presence of the crane and construction equipment on the bluffs and beach will temporarily degrade the view. When revetment construction is completed in three months, all equipment would be removed. The presence of construction equipment would have an insignificant impact on aesthetics.

The rock revetment would be a man-made structure in a natural setting. The revetment would degrade the view of the beach but would not affect the offshore seascape of kelp beds and rocks. A sea wall currently exists at the Ocean Park site. The presence of the revetment would not substantially alter the existing landscape or add an incompatible structure compared to the sea

wall of the existing condition, although it would extend further onto the beach than the sea wall. The impact of a rock revetment on aesthetics would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction equipment on aesthetics would be the same as for construction of the rock revetment, but construction would take four months rather than three months. Because the presence of construction equipment is temporary, the impacts to aesthetics would be insignificant.

The vertical sea wall would make the view of the bluffs from the beach less natural than unprotected bluffs; however, a sea wall already exists at this site. Because the vertical sea wall would not extend as far onto the beach as the rock revetment, it would have less of an effect on beach views. The offshore seascape of rocks and kelp would not be affected. The impact of a vertical sea wall on aesthetics would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The temporary impacts of construction equipment on aesthetics would be the same as for a rock revetment or a vertical sea wall, except that construction of a sculpted concrete/shotcrete wall would take five months. The impact of construction equipment on aesthetics would be insignificant.

The sculpted concrete/shotcrete wall would be more aesthetically pleasing than a rock revetment or a vertical sea wall because it would look more like natural bluff. The sculpted concrete/shotcrete wall also would be more aesthetically pleasing than the sea wall of the existing conditions. The impact on aesthetics would be insignificant.

No Action Alternative

Under the No Action alternative, the vertical sea wall at the Ocean Park site would continue to be present. Continued erosion might introduce unsightly rubble to the beach. Continuing erosion might result in the construction of additional emergency sea walls or revetments.

4.14.2.4 Price Street – North

Alternative 1: Rock Revetment

During construction, the presence of the crane and construction equipment on the bluffs and beach will temporarily degrade the view. When revetment construction is completed in five months, all equipment would be removed. The presence of construction equipment would have an insignificant impact on aesthetics.

The revetment would degrade the view of the beach but would not affect the offshore seascape of kelp beds and rocks. A rock revetment already exists at the Price Street - North site; therefore, the view of the new revetment on the beach will be similar to the existing view. The presence of the revetment would not substantially alter the existing landscape or add an incompatible

structure compared to the rock revetment of the existing condition. The impact of a rock revetment on aesthetics would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction equipment on aesthetics would be the same as for construction of the rock revetment, but construction would take seven months rather than five months. Because the presence of construction equipment is temporary, the impacts to aesthetics would be insignificant.

The vertical sea wall would make the view of the bluffs from the beach less natural than unprotected bluffs; however, a rock revetment currently exists at this site. Because the sea wall would not extend as far onto the beach as the rock revetment, it would have less of an effect on beach views. The offshore seascape of rocks and kelp would not be affected. The impact of a vertical sea wall on aesthetics would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The temporary impacts of construction equipment on aesthetics would be the same as for a rock revetment or a vertical sea wall, except that construction of a sculpted concrete/shotcrete wall would take eight months. The impact of construction equipment on aesthetics would be insignificant.

The sculpted concrete/shotcrete wall would be more aesthetically pleasing than a rock revetment or a vertical sea wall because it would look more like natural bluff. The sculpted concrete/shotcrete wall also would be more aesthetically pleasing than the rock revetment of the existing conditions. The impact on aesthetics would be insignificant.

No Action Alternative

Under the No Action alternative, the exposed existing rock revetment that presently degrades the view of the bluff and beach at the Price Street - North site would continue to be present. Erosion would continue to occur, possibly introducing unsightly rubble to the beach. In addition, emergency sea walls or revetments might be constructed.

4.14.2.5 Price Street – South

Alternative 1: Rock Revetment

During construction, the presence of the crane and construction equipment on the bluffs and beach will temporarily degrade the view. When revetment construction is completed in five months, all equipment would be removed. The presence of construction equipment would have an insignificant impact on aesthetics.

The revetment would degrade the view of the beach but would not affect the offshore seascape of kelp beds and rocks. A sea wall already exists at the Price Street - South site. The new revetment would extend onto the beach; however, the presence of the revetment would not substantially

alter the existing landscape or add an incompatible structure compared to the sea wall of the existing condition. The impact of a rock revetment on aesthetics would be insignificant.

Alternative 2: Vertical Sea Wall

The impacts of construction equipment on aesthetics would be the same as for construction of the rock revetment, but construction would take seven months rather than five months. Because the presence of construction equipment is temporary, the impacts to aesthetics would be insignificant.

The vertical sea wall would make the view of the bluffs from the beach less natural than unprotected bluffs; however, a vertical sea wall already exists at this site. Because the sea wall would not extend as far onto the beach as the rock revetment alternative, the sea wall would have less of an effect on beach views. The offshore seascape of rocks and kelp would not be affected. The impact of a vertical sea wall on aesthetics would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The temporary impacts of construction equipment on aesthetics would be the same as for a rock revetment or a vertical sea wall, except that construction of a sculpted concrete/shotcrete wall would take eight months. The impact of construction equipment on aesthetics would be insignificant.

The sculpted concrete/shotcrete wall would be more aesthetically pleasing than a rock revetment or a vertical sea wall because it would look more like natural bluff. The sculpted concrete/shotcrete wall also would be more aesthetically pleasing than the vertical sea wall of the existing conditions. The impact on aesthetics would be insignificant.

No Action Alternative

Under the No Action alternative, the exposed existing vertical sea wall at the Price Street - South site would continue to be present. Erosion would continue to occur, possibly introducing unsightly rubble to the beach. In addition, emergency sea walls or revetments might be constructed.

4.14.2.6 Cypress Street Lift Station

Alternative 1: Rock Revetment

During construction, the presence of the crane and construction equipment on the bluffs and beach will temporarily degrade the view. When revetment construction is completed in three months, all equipment would be removed. The presence of construction equipment would have an insignificant impact on aesthetics.

The presence of the rock revetment at the foot of the bluffs would degrade views of the bluff toe from the beach. Views of the ocean would not be affected. Much of the revetment would be buried by sand. Partial burial of the revetment at the Cypress Street Lift Station site would

reduce its impact on aesthetics. The impacts to aesthetics of a rock revetment at the Cypress Street Lift Station site would be insignificant.

Alternative 4: Steel Sheet Pile Wall

The impacts of construction equipment on aesthetics would be the same as for construction of the rock revetment, but construction would take four months rather than three months. Because the presence of construction equipment is temporary, the impacts to aesthetics would be insignificant. Once construction of the steel sheet pile wall is finished, it would be buried by sand and would not degrade views of the bluff. The impacts of a steel sheet pile wall on aesthetics would be insignificant.

No Action Alternative

Under the No Action alternative, erosion at the Cypress Street Lift Station site would continue, possibly introducing unsightly rubble to the beach. In addition, emergency sea walls or revetments might be constructed.

4.15 CLIMATE CHANGE ANALYSIS

4.15.1 Environmental Consequences

4.15.1.1 Significance Criteria

No nationally recognized significance criteria for climate change effects have been established. This section will disclose possible effects of sea level rise and temperature rise on the Project site and efforts made during design to offset the effects of sea level rise on Project design. Green house gas emissions are calculated and discussed in the Air Quality Section.

4.15.1.2 Analysis

Future sea level rise was taken into account in the design of the alternatives (Moffatt and Nichol 2010). A design life of 50 years was assumed for all alternatives, and thus a 50-year sea level rise projection was used to determine the design water level. A range of 50-year relative sea level rise projections was calculated for the Pismo Beach area. The low range of the projected sea level rise is 0.51 feet in 50 years, the intermediate rate is 1.13 feet, and the high rate is 1.75 feet. Bluffs are more vulnerable to storm-wave induced erosion during high tides because the maximum amount of wave energy that reaches a bluff is related to the depth of water at the toe of the bluff. Thus, the design water level was calculated using a 50-year recurrence extreme water level and a 50-year sea level rise.

Because sea level rise was taken into account in the design of the alternatives, the analysis of the impacts of those alternatives includes the analysis of sea level rise. However, over the 50-year time period, the sea level rise would result in a gradual loss of beach. This loss would occur with or without the construction of a rock revetment or a sea wall.

SECTION 5.0 – CUMULATIVE IMPACTS

The analysis of cumulative impacts considers whether the proposed Project, when viewed in connection with other planned projects, would have a combined significant effect on the environment. The only planned projects in the vicinity of the Pismo Beach Shoreline Protection Project are the construction of a new single-family residence at 2151 Shoreline Drive and a seawall repair/extension at 2054 Ocean Boulevard. The seawall extension would place new caissons along the edges of the existing seawall to protect against scour.

5.1 GEOLOGY

The sea wall extension will act cumulatively with the construction of shore protection at the Vista del Mar Lift Station and Ocean Park sites to reduce erosion of the bluffs in the vicinity of Ocean Boulevard. Shore protection in this area will not have a significant adverse impact on any unique geologic features or mineral resources and would not substantially alter topography. The cumulative impacts to geology would be insignificant.

5.2 OCEANOGRAPHY AND WATER QUALITY

Construction of shore protection from the proposed Project is not expected to have any measurable adverse effect on oceanography or water quality. The proposed sea wall extension on the bluffs off Ocean Boulevard would not be expected to adversely affect oceanography or water quality. The sea wall extension would act cumulatively with the proposed Project to reduce bluff erosion and the contribution of silt into the ocean from the erosion.

5.3 AIR QUALITY

The SLOAPCD states that a cumulative impact analysis should be performed to evaluate the combined air quality impacts of the Project and impacts from existing and proposed future development in the area. The area considered for cumulative impacts should encompass all planned construction activities within one mile of the Project. The Project area is well developed, and the City of Pismo Beach has determined that the only two proposed projects within the area are a single-family residence and a minor extension of a seawall. These projects involve minor amounts of equipment. It is anticipated that the cumulative effect of those two projects and the proposed Project would create an impact on air quality that would not be cumulatively considerable.

5.4 BIOLOGICAL RESOURCES

If shore protection is constructed at each of the six sites identified in the proposed Project, 1,490 feet of rock revetment and/or sea walls would be added to the bluffs at Pismo Beach. The proposed sea wall extension off Ocean Boulevard would add approximately another 20 feet. These projects will act cumulatively to reduce vegetation on the bluffs and replace beach with structures. In addition, structures may reduce the diversity of the macroinvertebrate community on the beach. Because most of the sites where new shore protection is proposed have some existing structure, and because none of the proposed structures would extend below mean sea level, the cumulative impacts to biological resources would not result in a substantial change in natural communities, and the impacts would be insignificant.

5.5 CULTURAL RESOURCES

The proposed Project is not expected to affect any cultural resources; therefore, the two small planned construction projects would not act cumulatively to affect cultural resources.

5.6 SOCIOECONOMICS

The proposed Project would not have an adverse impact on socioeconomics. The construction of structures to protect the bluffs would help to protect property and infrastructure and would have a beneficial impact on socioeconomics. The extension of the sea wall also would help to protect the bluffs. No cumulative adverse impacts would occur from the proposed Project and other planned projects.

5.7 RECREATION

During construction of a sea wall or revetment at each site, people will be prohibited from using a portion of the bluffs and beach at each site. The construction at the six sites identified in the proposed Project would not occur simultaneously; therefore, persons using the bluffs and beaches in the area for recreation would be restricted from only a small area at a time and would have other bluff top and beach areas that they could use when construction was occurring at a site. The single-family home on Shoreline Drive is not along the bluffs, and construction would not affect recreation. The vertical sea wall extension on Ocean Boulevard potentially could be constructed at the same time as one of the six sites. Even if two bluff-top structures were under construction at the same time, the impacts on recreation would be temporary and insignificant. When the construction of revetments and/or sea walls is completed, the shoreline protection structures would act cumulatively to protect recreational opportunities on the bluffs and beach.

5.8 SAFETY

During construction, none of the proposed shoreline protection alternatives at any of the six sites would interfere with an emergency response or evacuation plan. The two minor construction projects planned for the Project area also would not be expected to interfere with emergency response or evacuation plans. The long-term cumulative effect of all of the proposed shore protection structures would be to make the bluffs safer for persons, homes, and infrastructure.

5.9 LAND USE

Neither the proposed Project nor the two planned projects would change land use in the Project area. The proposed Project and the planned sea wall extension would help to protect existing land uses on the bluffs.

5.10 NOISE

If the house on Shoreline Drive and/or the sea wall extension at Ocean Boulevard are constructed at the same time as either the shoreline protection structure at the Vista del Mar Lift Station site or the Ocean Park site, these projects would add to the temporary noise impacts to residents in the area during the period that the projects are under construction. Neither the proposed Project nor the two planned projects would have any impact on noise when construction is finished.

5.11 VEHICULAR TRAFFIC

During construction of the proposed Project at each site, an average of about 30 trucks per day will be needed to deliver materials for the shoreline protection structure. This increase in traffic is less than 0.5 percent of the AADT on the major roadways and would temporarily add 2 to 3 trucks per hour on local streets. Shore protection at the six sites identified in the proposed Project would not be constructed simultaneously. If the two planned projects were constructed at the same time as one of the six sites, they might add additional traffic to the Project area. Neither project would be expected to require a large number of trucks to deliver materials. The impacts on traffic when added to the trucks for the proposed Project would still be an addition of less than 1 percent of the AADT on major roadways. The cumulative impacts to traffic of the proposed Project and the planned projects would be insignificant.

5.12 VESSEL TRAFFIC

Neither the proposed Project nor the two planned projects would have any effect on vessel traffic.

5.13 UTILITIES

Construction of a bluff protection structure at the Price Street - North, Price Street – South, and Cypress Street Lift Station sites would interrupt electrical service for a period of 8 to 10 hours to re-route overhead electrical lines. Neither of the two planned projects would interrupt electrical service in those areas. No cumulative adverse impacts on utilities would occur from the proposed Project and the planned projects.

5.14 AESTHETICS

If shore protection is constructed at each of the six sites identified in the proposed Project, 1,490 feet of rock revetment and/or sea walls would be added to the bluffs at Pismo Beach. The proposed sea wall extension off Ocean Boulevard would add approximately another 20 feet. The presence of shore protection structures on the bluffs cumulatively would degrade views of the bluffs and beach along the shoreline in the Project area; however, shoreline structures would not affect the views of the ocean, kelp beds, and offshore rocks. Under the existing condition, bluff erosion has resulted in the deposition of rubble on and below the bluffs, the exposure of pipes and other infrastructure, and the construction of a variety of shoreline structures. The cumulative impact of the Project structures and the planned sea wall extension would not significantly degrade the existing viewshed compared to the existing condition.

5.15 CLIMATE CHANGE ANALYSIS

The 1,490 feet of rock revetment and/or sea walls that would be added to the bluffs at Pismo Beach would act cumulatively with the proposed sea wall extension off Ocean Boulevard to protect the bluffs from erosion caused by sea level rise. The shore protection proposed for this project would act cumulatively with the Ocean Boulevard sea wall extension to fix the shoreline in the project area and prevent retreat of the fluffs as sea level rises. Therefore, the project would contribute cumulatively to loss of beach in the project area due to sea level rise.

SECTION 6.0 – ENVIRONMENTAL COMMITMENTS

The following subsections list the actions committed to be undertaken by the USACE for the proposed action to reduce environmental impacts to the extent possible. These actions may be part of the Project design as best management practices or specific features to reduce environmental impacts; monitoring activities to alert the USACE and the contractor of potential environmental impacts; and mitigation measures to compensate for actual impacts to the environment.

6.1 GENERAL

- The USACE will continue to coordinate all aspects of the proposed action with concerned agencies and document that coordination, as appropriate.
- The Contractor shall place warning signs, and temporary fencing around construction areas to keep the public from entering dangerous construction areas.

6.2 WATER QUALITY

- The Contractor shall be responsible for the preparation and adherence to a Spill Prevention, Containment, and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill.
    - Construction and maintenance fluids (oils, antifreeze, fuels) shall be stored in closed containers and disposed of promptly away from the ocean.
    - Fluids released because of spills, equipment failure (broken hose, punctured tank), accident due to waves or refueling should be immediately controlled, contained, and cleaned-up. All contaminated materials should be disposed of promptly away from the ocean. Refueling of equipment shall not occur close to the ocean. If that is not possible, barriers shall be placed around the site.
- The Contractor shall be responsible for the preparation and adherence to a Storm Water Pollution Prevention Plan. This plan shall specify Best Management Practices (BMPs), including collection and storage of all debris away from the ocean and erosion control measures to prevent dirt or construction materials from entering the ocean.

6.3 AIR QUALITY

- All off-road construction equipment shall:
    - be maintained in proper tune, according to manufacturer's specification;
    - fueled with CARB-certified motor vehicle diesel fuel (non-taxed version suitable for use off-road);

- Meet CARB's Tier 2 certified engine level or cleaner and comply with State Off-Road Regulations.

- All on-road heavy-duty trucks servicing the Project site shall:
  - Meet CARB's 2007 or cleaner certification standard for heavy-duty diesel engines, and comply with the State On-Road Regulations;
    - Construction or trucking companies with fleets that that do not have engines in their fleet that meet the engine standards identified in the above two measures (e.g., captive or NO_X exempt area fleets) may be eligible by proving alternative compliance.

6.4 BIOLOGICAL RESOURCES

- At all sites (except Cypress Street Lift Station), before beginning any construction activities on the site, it shall be determined whether any harbor seals are hauled out on the beach. If harbor seals are observed on the beach, no construction activities shall occur until the seals leave the beach.

- A biological monitor shall be present during any construction activities on the site during the first week. If snowy plovers are observed near the construction area, the monitor will advise the work crews on how to avoid or minimize impacts to plover, which may include temporarily halting activities, until the plovers have left the site. Minimization measures shall continue throughout the site construction.

- Revetment alternative for the Cypress Street Lift Station only: After construction of the revetment, the buried portion of the revetment and the additional area disturbed by construction equipment, as well as adjacent areas if necessary, shall be revegetated with native dune vegetation.

- At the Price Street - South site, prior to construction of the revetment or sea wall, a survey for La Graciosa thistle should be conducted in central coastal scrub habitat within the footprint of the structure. If the plant is observed, seeds should be planted in central coastal scrub habitat that will not be disturbed by the construction.

6.5 CULTURAL RESOURCES

- If cultural resources are discovered prior to or during work and cannot be avoided, work will be suspended in that area until resources are evaluated for eligibility for listing in the NRHP after consultation with the SHPO. If resources are deemed eligible for the NRHP, the effects of the Project will be taken into consideration in consultation with the SHPO. The Advisory Council on Historic Preservation (ACHP) will be provided an opportunity to comment in accordance with 36 CFR 800.13.

6.6 NOISE

- The contractor shall implement measures to reduce construction noise at the St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, and Cypress Street Lift Station sites. Noise reduction measures shall limit noise increases at the nearest sensitive receptor to a maximum increase of 10 dBA over ambient noise levels. The Contractor shall monitor noise levels on a daily basis and in response to complaints during construction.

- The City shall notify all residents and businesses within 100 feet of the construction staging site for each site of the construction schedule.

- The City shall set up a hotline for noise complaints associated with the proposed Project. All noise complaints shall be investigated, construction noise shall be measured at the site, and the effectiveness of the noise reduction measures shall be re-evaluated.

6.7 VEHICULAR TRAFFIC

- At the St. Andrews Lift Station site, signs and persons to direct traffic shall be placed on Seacliff Drive at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s)

- At the Vista del Mar Lift Station and Ocean Park sites, signs and persons to direct traffic shall be placed on Ocean Boulevard at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s)

- At the Price Street - North and Price Street - South sites, signs and notices shall be posted warning of the dates and times that Price Street will be closed. The notices shall include identification of alternate routes.

- At the Price Street - North and Price Street - South sites, signs and persons to direct traffic shall be placed on Price Street at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s) or safely turn around and proceed to the detour.

6.8 UTILITIES

- At the Price Street - North, Price Street - South, and Cypress Street Lift Station sites, the construction contractor shall inform all parties that would be affected by the interruption in electrical service of the date and time that electrical service would be interrupted. The contractor shall work with affected parties to minimize duration of the interruption and any problems that may be caused by the interruption.

SECTION 7.0 – COORDINATION

7.1 AGENCY COORDINATION

The proposed shoreline protection Project in San Luis Obispo County, California, has been coordinated with the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NOAA Fisheries), and the State Historic Preservation Office. A species list was requested from the USFWS and NMFS. This Project has a may effect, but not likely to adversely effect, determination for potential construction impacts to snowy plover; it will not affect other listed species or critical habitat; therefore, informal consultation is requested. In addition, comments received on this draft EA will be addressed.

7.2 PUBLIC COORDINATION

This EA/MND will be made available to the public for a 30-day review period. Following this period and a review of the comments received, a final determination will be made by the District Engineer.

SECTION 8.0 – ENVIRONMENTAL COMPLIANCE (FEDERAL)

All applicable laws, regulations, and Executive Orders were considered during preparation of this EA. Those pertinent to this action are discussed in the paragraphs below.

8.1 NATIONAL ENVIRONMENTAL POLICY ACT (42 U.S.C. 4341 ET SEQ.)

This EA has been prepared in accordance with the goals and requirements set forth in Section 102 of this Act. Potential environmental effects have been included in the evaluation of the Project. Procedural review requirements have been met as detailed by the Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500-1508); and the U.S. Army Corps of Engineers, Policy and Procedure for Implementing NEPA (33 CFR Part 230).

8.2 ENDANGERED SPECIES ACT OF 1973 (16 U.S.C. 1531 ET SEQ.)

Section 7(c) of the Endangered Species Act requires consultation with the USFWS or National Marine Fisheries Service to determine if a Federal Action will affect threatened or endangered wildlife species and to ensure that any action does not jeopardize the continued existence of, or result in the destruction of the habitat of, any endangered or threatened species. A species list was requested from the USFWS and NMFS. This Project has a may effect, but not likely to adversely affect determination for potential construction impacts to snowy plover; it will not affect other listed species or critical habitat; therefore, informal consultation is requested. This Project is in compliance with the ESA.

8.3 CLEAN WATER ACT OF 1977 (33 U.S.C 1251 ET SEQ.)

The proposed action, with environmental commitments, will be in compliance with the guidelines promulgated by the Administrator, Environmental Protection Agency, under the authority of Section 404(b)(1) of the Clean Water Act (33 USC 1344). A 404(b)(1) evaluation is included in Appendix B.

8.4 CLEAN AIR ACT (CAA)

The potential air quality impacts of the proposed Project have been examined and compared to the significance levels identified by the San Luis Obispo Air Pollution Control District. No additional significant short- or long-term adverse impacts to local or regional air quality are anticipated that have not already been addressed in prior NEPA documents for the area. The draft EA was sent to the SLOAPCD for comment during the public review period.

8.5 COASTAL ZONE MANAGEMENT ACT OF 1972 (CZMA) (16 U.S.C. 1531 ET SEQ.)

As a Federal agency, the Los Angeles District, U.S. Army Corps of Engineers (USACE) is responsible for ensuring project compliance with the federal Coastal Zone Management Act of 1972 (CZMA). Section 307 of the CZMA [Title 16, U.S. Code Section 1456(c)] states that Federal Actions must be consistent with approved State coastal management programs to the maximum extent practicable. The California Coastal Act is this State's approved coastal

management program applicable to the proposed Project. To document the degree of consistency with the State program, the CZMA requires the preparation of a Consistency Determination (CD) whenever a project could directly affect the coastal zone. This CD provides a description of the proposed Project, discusses the proposed Project's consistency, and where applicable, describes measures, which when implemented, will result in project consistency with State policies to the maximum extent practicable.

The USACE has completed an Environmental Assessment which: 1) identifies and discusses the problems and needs related to this action, 2) evaluates alternatives, and 3) addresses the impacts of the proposed Project and alternatives as part of the decision process. The determination of consistency with the California Coastal Act is based on the analysis performed for this EA. This EA was prepared in compliance with the Council on Environmental Quality (CEQ) Regulations (40 C.F.R. 1500-1508) and the procedural provisions of Section 102(2) (c) of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321, as amended. The NEPA was used as a measure for assessing the magnitude of Project impacts.

The Los Angeles District has determined that the proposed Project is consistent, to the maximum extent practicable, with the Coastal Zone Management Act of 1972.

8.6 EXECUTIVE ORDER 12898, ENVIRONMENTAL JUSTICE

The proposed Project will not result in any substantial adverse or disproportionate impacts to any minority populations, low-income populations, or children in the Project area. Furthermore, the Project would not have a substantial adverse effect on human or socioeconomic resources. Therefore, the proposed action is in compliance with this Executive Order.

8.7 EXECUTIVE ORDER 11990, PROTECTION OF WETLANDS

The Project is in compliance with the requirements of this Executive Order. No wetland areas are located within the Project area to be affected by the proposed Project action.

8.8 EXECUTIVE ORDER 11988, FLOODPLAIN MANAGEMENT

The proposed Project action is in compliance with the requirements of this Executive Order.

8.9 NATIONAL HISTORIC PRESERVATION ACT (NHPA) OF 1966

A records and literature search and field survey of the area of APE was conducted. No sites eligible for listing on the National Register of Historic Places would be affected by this undertaking. The USACE will transmit the results of USACE investigations to the SHPO for review. Once the SHPO concurs with this determination, the Project will be in compliance with the act as implemented by 36 CFR 800.

8.10 FISH AND WILDLIFE COORDINATION (FWCA)

This Project has been informally coordinated with the USFWS, California Department of Fish and Game (CFDG), and NOAA Fisheries. In accordance with the requirements of this Act, the

USACE will continue to maintain coordination with these agencies during all phases of the Project.

8.11 MAGNUSON-STEVENS FISHERY MANAGEMENT AND CONSERVATION ACT, AS AMENDED 1996 (PUBLIC LAW 104-267)

Federal agencies must consult with NOAA Fisheries on actions that may adversely affect Essential Fish Habitat (EFH). EFH is defined as those "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". NOAA Fisheries encourages streamlining the consultation process using review procedures under NEPA, FWCA, CWA, and/or ESA, provided that documents meet requirements for EFH assessments under Section 600.920(g). EFH assessments must include (1) a description of the proposed action, (2) an analysis of effects, including cumulative effects, (3) the Federal agency's views regarding the effects of the action on EFH, and (4) proposed mitigation, if applicable. The description and evaluation of EFH for the coastal zone is included in this EA/MND in Section 4.4.2.8.

SECTION 9.0 – ENVIRONMENTAL COMPLIANCE (STATE)

9.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA requires State and local agencies to disclose and consider the environmental implications of their actions. It further requires that agencies, when feasible, avoid or reduce the significant environmental impacts of their decisions. This document meets the goals, policies, and requirements of CEQA. Information and analysis to meet CEQA requirements are included within this EA for each resource. An Initial Study Checklist was completed and is attached as Appendix E to this document.

9.2 PORTER-COLOGNE WATER QUALITY CONTROL ACT OF 1967

The Porter-Cologne Water Quality Act extends to all "waters of the State," including surface and subsurface waters, and saline waters. This act requires anyone proposing to discharge waste within any region of the State to comply with requirements established by the regional Basin Plans. The Regional Boards also must comply with the CWA anti-degradation policy. The proposed action, with the above environmental commitments, will be in compliance with this Act.

9.3 CALIFORNIA CLEAN AIR ACT (CCAA)

Similar to the federal counterpart, the potential air quality impacts of the proposed Project have been examined and compared to the significance levels identified by the San Luis Obispo Air Pollution Control District. No additional significant short- or long-term adverse impacts to local or regional air quality are anticipated that have not already been addressed in prior NEPA documents for the area. The draft EA was sent to the SLOAPCD for comment during the public review period.

9.4 CALIFORNIA ENDANGERED SPECIES ACT (CESA)

The California Endangered Species Act (CESA) parallels FESA. As a responsible agency, the CDFG has regulatory authority over state-listed endangered and threatened species. Since the proposed Project may affect species that are listed as threatened or endangered under both the State and federal Endangered Species Acts and, since the Project is subject to CEQA review and federal review pursuant to NEPA, the CDFG shall participate to the greatest extent practicable in the federal endangered species consultation. The State legislature encourages cooperative and simultaneous findings between State and federal agencies. Further, the General Counsel for the CDFG has issued a memorandum to CDFG regional managers and division chiefs clarifying the CESA consultation process wherein, if a federal Biological Opinion has been prepared for a species, the CDFG must use this Biological Opinion in lieu of its own findings unless it is inconsistent with CESA. CDFG Code Section 2095 authorizes participation in federal consultation and adoption of a federal Biological Opinion. By adopting the federal Biological Opinion, the CDFG need not issue a taking permit per Section 2081 of the State Code. If the Biological Opinion is consistent with CESA, the CDFG will complete a 2095 form in finalizing the adoption of the Biological Opinion. If the federal Biological Opinion is found to be inconsistent with CESA, the CDFG will issue its own Biological Opinion per Section 2090 of the

State Code and may issue a 2081 take permit with conditions of approval. The proposed Project would comply with this Act.

9.5 CALIFORNIA COASTAL ACT OF 1976

The Act specifies basic goals for coastal conservation and development related to protection, enhancement, and restoration of coastal resources, giving priority to "coastal-dependent" uses and maximizing public access to California residents and visitors. The Act defines the "coastal zone" of California, which generally extends 3 miles out to sea and inland generally 1,000 yards. Each city and county in California which is on the coast must prepare a Local Coastal Program (LCP) for all areas within the coastal zone. The LCP includes Land Use Plans, zoning ordinance amendments and map changes to reflect the Coastal Act and LCP goals and policies at the local level. The proposed Project is expected to have no significant adverse effect on the coastal zone of California and is consistent, as applicable, with State water quality standards and with California's federally approved Coastal Zone Management Program.

SECTION 10.0 – LIST OF PREPARERS

Agencies and contractors responsible for the preparation and review of this EA/MND include the following:

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U.S. Army Corps of Engineers

Larry Smith - Planning Division, Environmental Resources Branch

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Individuals responsible for preparation of this EA/MND and/or the associated appendices included:

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Lisa Louie	Environmental Compliance
Heather Clayton	Biological Resources
Noel Davis	Geology, Oceanography and Water Quality, Biological Resources, Socioeconomics, Safety, Land Use, Traffic, Utilities, Aesthetics
Joe O'Bannon	Air Quality
Roma Stromberg	Noise

SECTION 11.0 – ACRONYMS AND ABBREVIATIONS

11.1 ACRONYMS

AADT	Annual Average Daily Traffic
AAQS	Ambient Air Quality Standards
ADAM	Aerometric Data Analysis and Management System
a.m.	Ante meridiem, before noon
APE	Area of Potential Effects
BC ratio	Benefit Cost ratio
BMP	Best Management Practice
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAP	Continuing Authorities Program
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act of 1970
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CHRIS-CCIC	California Historical Resources Information System at the Central Coast Information Center
COMM	commercial and sports fishing
COOP	Cooperative Observer Program, National Weather Service
CWA	Clean Water Act of 1977
CZMA	Coastal Zone Management Act
DPM	Diesel Particulate Matter
EFH	Essential Fish Habitat
ESU	Evolutionarily Significant Unit
FE	Federal-listed, endangered species
FESA	Federal Endangered Species Act of 1973
FT	Federal-listed, threatened species
FWCA	Fish and Wildlife Coordination Act of 1958
GIS	Geographic Information System
IND	industrial
LCP	Local Coastal Program
MAR	marine habitat
MHHW	mean higher high water
MHW	mean high water
MLLW	mean lower low water
MLW	mean low water
MTL	mean tide level
NAAQS	National Ambient Air Quality Standards
NAHC	National Historic Preservation Act
NAV	navigation
NEPA	National Environmental Policy Act of 1969
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act

NOAA	National Oceanographic and Atmospheric Administration
NOAA Fisheries	National Marine Fisheries Service
p.m.	Post meridiem, after noon
RARE	rare, threatened, or endangered species
REC	recreation
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SE	State-listed, endangered species
SHELL	shellfish harvesting
SHPO	State Historic Preservation Office
SLOAPCD	San Luis Obispo Air Pollution Control District
ST	State-listed, threatened species
USACE	United States Army Corps of Engineers, Los Angeles District
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WILD	wildlife habitat

11.2 UNITS OF MEASUREMENT

ac	acre(s)
ºC	degrees Celsius
dB	decibels
dBA	decibels using A weighted measurements
ºF	degrees Fahrenheit
ft	foot/feet
ft^2	square feet
hp	horsepower
lbs	pounds
L_{dn}	Day-night average noise level
L_{eq}	equivalent noise level
mi	mile(s)
mi^2	square mile(s)
ppm	parts per million
tpq	tons per quarter
yr	year
%	percent

SECTION 12.0 – REFERENCES

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APPENDIX A – MAILING LIST

010-505-017
CITY OF PISMO BEACH
MEMORY PARK

010-503-004
OCCUPANT
165 PADDOCK
PISMO BEACH CA 93449

010-503-005
OCCUPANT
163 PADDOCK
PISMO BEACH CA 93449

010-503-002
OCCUPANT
170 BAKER ST
PISMO BEACH CA 93449

010-503-003
OCCUPANT
176 BAKER AVE
PISMO BEACH CA 93449

010-502-004
OCCUPANT
173 BAKER
PISMO BEACH CA 93449

010-502-005
OCCUPANT
165 BAKER AVE
PISMO BEACH CA 93449

010-502-009
OCCUPANT
170 NAOMI
SHELL BEACH CA 93449

010-501-009
OCCUPANT
195 NAOMI
PISMO BEACH CA 93449

010-501-010
RICHARD LOUGHEAD
185 NAOMI
SHELL BEACH CA 93449

010-505-017
CITY OF PISMO BEACH
MEMORY PARK

010-503-004
OCCUPANT
165 PADDOCK
PISMO BEACH CA 93449

010-503-005
OCCUPANT
163 PADDOCK
PISMO BEACH CA 93449

010-503-002
OCCUPANT
170 BAKER ST
PISMO BEACH CA 93449

010-503-003
OCCUPANT
176 BAKER AVE
PISMO BEACH CA 93449

010-502-004
OCCUPANT
173 BAKER
PISMO BEACH CA 93449

010-502-005
OCCUPANT
165 BAKER AVE
PISMO BEACH CA 93449

010-502-009
OCCUPANT
170 NAOMI
SHELL BEACH CA 93449

010-501-009
OCCUPANT
195 NAOMI
PISMO BEACH CA 93449

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010 243 025
Occupant At
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APPENDIX B – CWA 404(b)(1) EVALUATIONS

SECTION 404(b)(1) EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO WATERS OF THE UNITED STATES: NEWPORT DUNES DREDGING PROJECT

I. INTRODUCTION:

The following evaluation is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) as amended by the Clean Water Act of 1977 (Public Law 95-217). The intent of this document is to state and evaluate information regarding the effects of the discharge of dredged or fill material into waters of the United States.

II. PROPOSED PROJECT:

a. Location:

The project area is located in the northern portion of the City of Pismo Beach in San Luis Obispo County, California. The project area extends from the St. Andrews Lift Station near Seacliff Drive and Memory Park in the Shell Beach area to the Cypress Street Lift Station near the foot of Harloe Street just north of the Pismo Beach Pier. The specific location of each of the sites is described below:

- St. Andrews Lift Station – The site is located in front of the lift station near the intersection of Baker Avenue and Seacliff Drive in Shell Beach. Memory Park is near the site.
- Vista del Mar Lift Station – The site is located in front of the Vista Del Mar Lift Station near the intersection of Vista del Mar Avenue and Ocean Boulevard in Shell Beach.
- Ocean Park – The site is located in front of Ocean Boulevard between Wawona Avenue and Capistrano Avenue in Shell Beach.
- Price Street - North – The site is located off Price Street in Pismo Beach. The site is between Dinosaur Caves Park and the Best Western Shelter Cove Lodge.
- Price Street - South – The site is located off Price Street near tennis courts between the Best Western Shelter Cove Lodge and the Pelican Point Restaurant adjacent to the Best Western Shorecliff Hotel.
- Cypress Street Lift Station - The site is located in front of the lift station at the foot of Harloe Avenue.

General Description:

The proposed project is to construct a bluff protection structure at six critically eroding bluff sites in Pismo Beach. A rock revetment (Alternative 1) and three different sea wall designs (Alternatives 2, 3, and 4) are being considered. The sea wall alternatives are a vertical concrete wall (Alternative 2), a sculpted concrete/shotcrete wall (Alternative 3) and (at the Cypress Street Lift Station site only), a steel sheet pile wall (Alternative 4). Different alternatives may be selected at different sites, and the project may consist of a combination of sea walls and rock revetments. Table 1 compares the footprint of the alternatives at each site.

Table 1 Habitat Loss for Each Alternative at Each Site

Site	Alternative	Habitat Losses (acres)				
		Bluff Face	Total Beach	Total Rocky	Intertidal Beach	Intertidal Rocky
St Andrews Lift Station	1	0.09	0.18	0.09	0.02	0.01
	2	0.09	0.06	0.03	0	0
	3	0.09	0.06	0.03	0	0
Vista del Mar Lift Station	1	0.04	0.17	0	0.04	0
	2	0.04	0.06	0	0	0
	3	0.04	0.06	0	0	0
Ocean Park	1	0.07	0.20	0.06	0.06	0.02
	2	0.07	0.08	0.04	0	0
	3	0.07	0.08	0.04	0	0
Price Street - North	1	0.31	0.39	0.16	0.03	0.01
	2	0.31	0.22	0.07	0	0
	3	0.31	0.22	0.07	0	0
Price Street - South	1	0.18	0.16	0.02	0.02	0.003
	2	0.18	0.12	0.01	0.01	0.001
	3	0.18	0.12	0.01	0.01	0.001
Cypress Street Lift Station	1	0.55	0.87	0	0	0
	4	0.55	0.15	0	0	0

b. Purpose:

The six sites proposed for protection are suffering severe and accelerating erosion. At each of the sites, roadways, utilities, and/or parks and in some cases houses are threatened. Bluff protection in the past has consisted of a hodgepodge of emergency measures, such as revetments and seawalls, that are unsightly and ineffective. The erosion also makes it difficult and unsafe for the public to access the shoreline. Bluff erosion is an ongoing dynamic process that will continue to impact the Pismo Bluffs. Ongoing retreat is likely to continue to encroach upon existing structures located above the seacliff, undermine coastal stairways and seawalls, and erode adjacent lands reducing building setbacks. At these sites increased erosion eventually will result in the loss of utilities, park space and roads, and the construction of stopgap emergency protective structures. For example, Price Street likely will be damaged by erosion within the

next decade, and Highway 101 also is in jeopardy. Protection of the bluff toe is needed to keep the seacliffs at these sites from additional wave erosion.

c. General Description of Fill Material:

The revetment for Alternative 1 would be made of rock. The vertical concrete sea wall of Alternative 2 would be made of concrete. The sculpted concrete/shotcrete wall of Alternative 3 would be made of concrete and shotcrete. The sheet pile wall of Alternative 4 would be made of steel. All alternatives would have shotcrete on the upper bluffs.

d. Description of the Proposed Discharge Sites:

The discharge sites are the bluffs and beach of the six sites along the Pismo Bluffs. All six sites are at the toe of eroding bluffs. The five northern sites, which include St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, Price Street - North and Price Street - South, consist of pocket beaches along a generally rocky shoreline with a mixture of rock and sand beach. The Cypress Street Lift Station site is on a wide sandy beach with disturbed dune scrub habitat on the back beach.

e. Description of Disposal Methods:

Construction material and equipment will be lowered to the beach with a crane and work will be done from the beach or a platform above the beach. Rock will be placed with a loader or forklift and concrete with a concrete pump truck. Steel sheet piles for Alternative 4 at the Cypress Street Lift Station would be installed with a jack hammer or vibratory drill and steel sheets will be welded to the piles.

III. ENVIRONMENTAL AND PUBLIC INTEREST FACTORS CONSIDERED:

A. Alternatives (33 CFR 320.4(b)(4), 40 CFR 230.10):

1. No action (no project):

Under the No Action alternative, there would be no planned protection of the bluffs at the six eroding sites in Pismo Beach. The bluffs at these sites would continue to erode and impact property, infrastructure and coastal access. Emergency attempts to control the erosion may result in the construction of sea walls and/or revetment without proper planning or technical or environmental review.

2. Disposal Site Alternatives:

a. Offshore breakwater - Offshore breakwaters protect shorelines by reducing wave energy and the transport of sand off the beach. An offshore breakwater was not considered further for shore protection at Pismo Beach because breakwater construction would impact numerous valuable coastal resources, including surfgrass, kelp beds that provide habitat for the federally threatened sea otter, and offshore rocks that provide seabird roosting sites and harbor seal haul out sites. In addition, the use of an offshore breakwater for shore protection would require sand nourishment for bluff toe protection from high water levels. Sand nourishment would have additional impacts. Because of the environmental impacts and the fact that an offshore breakwater would be ineffective in protecting the bluffs, this alternative was eliminated from further consideration.

b. Groin - Groins provide shore protection by holding sand on the beach in their lee. However, like the offshore breakwater alternative, construction of a groin in the intertidal/shallow subtidal has the potential to impact valuable marine resources, including kelp and surfgrass. Furthermore, groins are dependent upon longshore sediment transport to retain sand in the area that needs protection. There is very little sediment transport in the project area. Therefore, groins would not provide the necessary bluff protection to meet the project purpose and need. Because of the

environmental impacts and the fact that groins would be ineffective in protecting the bluffs, this alternative was eliminated from further consideration

c. Beach nourishment - Sand nourishment is often used to create wide sandy beaches that provide bluff protection under severe storm wave conditions. However, it would not be practical to attempt to establish a wide sandy beach along the base of the Pismo Beach sites because of the high wave energy in this area and the fact that the wave energy is directed strongly south. These large southerly waves would transport the sand rapidly away from the study sites toward Pismo State Beach. In other words, the natural erosional state of the project area precludes wide sandy beaches. This alternative was not analyzed further because the sand would not last long enough to provide reliable bluff protection.

B. Physical/chemical characteristics of the aquatic environment and anticipated changes:

(X) **substrate:** Most of the project impacts on substrate would occur above the mean higher high water line and would only affect areas that are tidal under extreme high surf and high tide conditions (Table 1). Impacts to beach areas below the mean high tide line for the rock revetment alternative would range from 0 at the Cypress Street Lift Station to 0.06 acres at Ocean Park. Most of the impact would be to cover sand beach with rocks. At St. Andrews Lift Station, Ocean Park, Price Street - North and Price Street - South, between 0.003 and 0.02 acres of rocky intertidal primarily in the splash zone would be covered by large boulders. The sea wall alternatives would not affect habitat below mean higher high water with the exception of the sea wall alternatives at Price Street - South that would effect 0.01 acres of beach, of which 0.001 acres would be high rocky intertidal.

( ) **currents, circulation or drainage patterns:** The proposed action would be above the mean tide line and would not affect currents, circulation, or drainage patterns.

( ) **suspended particulates; turbidity:**

1) **Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Sites:** The proposed action would have minimal effect on suspended particulates and turbidity levels in the vicinity of the sites. Because the project would reduce bluff erosion, there would be a small decrease in sediment eroded from the bluffs by ocean waves.

2) **Effects on Chemical and Physical Properties of the Water Column:** The proposed action would be above the mean tide line and would not have any affect on the chemical and physical properties of the water column.

3) **Effects of Turbidity on Biota:** None of the alternatives would create turbidity that would affect the biota.

( ) **Water quality (temperature, salinity patterns and other parameters):** The proposed action would be above the mean tide line and would not have any affect on the chemical and physical properties of the water column.

( ) F**lood control functions:** The bluffs where the bluff protection structure would be constructed do not have a flood control function and the proposed action, therefore, would not affect flood control functions.

(X) **Storm, wave and erosion buffers:** The proposed action would protect the bluffs from erosion from storm waves.

(X) **Erosion and accretion patterns:** The proposed action would protect the bluffs from erosion from

storm waves. The bluff protection structures have been designed to tie into existing bluff features to avoid erosion around the end of the structures.

( ) **Aquifer recharge:** The proposed action would occur on the face of the bluffs and would not affect groundwater recharge.

( ) **Baseflow:** The proposed action would occur on the bluff face above the mean tide line and would not affect baseflow.

( ) **Mixing zone, in light of the depth of water at the disposal site; current velocity, direction and variability at the disposal site; degree of turbulence; water column stratification; discharge vessel speed and direction; rate of discharge; dredged material characteristics; number of discharges per unit of time; and any other relevant factors affecting rates and patterns of mixing:** The proposed action would be above the mean tide line and would not affect the mixing zone.

C. Anticipated changes to the biological characteristics of the aquatic environment:

( ) **Special aquatic sites (wetlands, mudflats, coral reefs, pool and riffle areas, vegetated shallows, sanctuaries and refuges, as defined in 40 CFR 230.40-45):** The proposed action would occur on the unvegetated upper beach. No special aquatic sites would be affected.

(X) **Habitat for fish and other aquatic organisms:** The proposed action would be on the upper beach. Some intertidal macroinvertebrates in the upper intertidal zone will be affected by the placement of the rock revetment at all sites but Cypress Street Lift Station. The revetment would replace sandy beach or upper rocky intertidal habitat with large rocks. Sandy beach organisms that occupy these high intertidal zones include beach hoppers (*Megalorchestia* spp.) and insects such as kelp flies that are associated with the macrophyte wrack that tends to accumulate at the high tide line. This upper beach habitat would be replaced by rocks that would support species, such as periwinkles, typical of high intertidal rocky habitats. The sea wall alternatives would not affect the tidal zone except at Price Street - South, where 0.01 acres of high intertidal habitat would be covered by the wall.

The rock revetment will result in some loss of habitat for surf zone fishes at all of the sites except the Cypress Street Lift Station. The rock revetment alternatives at the other sites will extend to elevations between +3 feet MLLW at the Ocean Park site to +5 feet MLLW at Price Street - South. Therefore, the rock revetment alternatives will result in some loss of habitat used by surf zone fishes during high tides. The amount of habitat below +5 feet that will be covered by the rock revetment ranges from 0.02 acres at the St. Andrews Lift Station and Price Street - South sites to 0.06 acres at the Ocean Park site. The sea wall alternatives will not extend below the mean high tide line and would not be expected to have any impact on fishes. None of the alternatives are expected to affect grunion spawning. The beaches at the 5 northern sites are cobble pocket beaches that are unlikely to support grunion spawning. The rock revetment or sea wall at the Cypress Street Lift Station site would be constructed above the reach of all but the most extreme storm surge and high tide events.

(X) **Wildlife habitat (breeding, cover, food, travel, general):** The proposed action would result in a small loss of beach for shorebirds and harbor seals. The total loss of beach if a revetment were constructed at all six sites would be 1.97 acres. Loss of less than 2 acres of upper beach would have minimal impact on shorebirds and harbor seals.

(X) **Endangered or threatened species:**

1) Listed endangered and/or threatened species or designated critical habitat present on site: No critical habitat is present at any of the sites. The federal threatened western snowy plover does not nest at any of the sites but may at times forage on project area beaches. The La Graciosa thistle, a federal endangered and state threatened species, has a low potential to occur in central coast scrub habitat within the site. The potential is considered low because central coast scrub habitat along the Pismo Beach bluffs consist of small patches. A November 2009 survey by a botanist did not detect La Graciosa thistle at any site, but Price Street - South could not be surveyed because of a lack of beach access. Therefore, there is a small chance that La Graciosa thistle could be present at Price Street - South.

2) Proposed listed endangered and/or threatened species or proposed critical habitat present on site: No proposed listed endangered and/or threatened species or proposed critical habitat is present on the site.

3) Compliance with ESA - Formal/Informal consultation or conference: A species list was requested from the USFWS and NOAA Fisheries. This project has a may effect, but not likely to adversely effect determination for potential construction impacts to snowy plover; it will not affect other listed species or critical habitat; therefore, informal consultation is requested. This project is in compliance with the ESA.

( ) **Biological availability of possible contaminants in dredged or fill material, considering hydrography in relation to known or anticipated sources of contaminants; results of previous testing of material from the vicinity of the project; known significant sources of persistent pesticides from land runoff or percolation; spill records for petroleum products or designated (Section 311 of the CWA) hazardous substances; other public records of significant introduction of contaminants from industries, municipalities or other sources:** The fill material is inert and will not have biologically available contaminants.

D. Anticipated changes to the human use characteristics of the aquatic environment:

( ) **Existing and potential water supplies; water conservation:** The proposed action would occur on the bluff face and upper beach and would not affect water supplies or water conservation.

( ) **Recreational or commercial fisheries:** Except for excluding shore fishermen from a small portion of the beach during construction of the bluff protection structure, the proposed action would not affect fishing.

(X) **Other water related recreation:** The proposed action would exclude beach activities from a small portion of the beach in the Pismo Bluffs area during construction of the bluff protection structure. After construction, a portion of the upper beach at each site would be occupied by the shore protection structure. Beach would still be available at each site for recreational beach goers. The greatest percentage of beach that could be affected by the proposed action is for a rock revetment at Ocean Park. At Ocean Park, a rock revetment would occupy 51 percent of the small beach at this site. The proposed action would have no affect on offshore water related recreation.

( ) **Aesthetics of the aquatic ecosystem:** The bluff protection structure would be a man-made structure in a natural setting. At all sites except Cypress Street Lift Station, the structure would affect the view of the beach, but would not affect the offshore seascape of kelp beds and rocks. Most of the sites have emergency revetments or sea walls, as well as rubble that has fallen to the beach from erosion. Therefore, the proposed action would not substantially degrade the existing aesthetics at the sites. A sea wall, especially the sculpted concrete/shotcrete wall, which would look like natural bluffs, would have less impact on aesthetics than a rock revetment. At Cypress Street Lift Station, the bluff protection structure would be buried and would not affect aesthetics.

( ) **Parks, national and historic monuments, national seashores, wild and scenic rivers, wilderness areas, research sites, etc.:** The proposed action would help to protect bluff top park areas from loss due to erosion. The proposed action would not affect any national and historic monuments, national seashores, wild and scenic rivers, wilderness areas or research sites.

( ) **National natural landmarks program:** The proposed action would have no effect on national landmarks.

( ) **Traffic/transportation patterns:** During construction, traffic on local streets as well as Highway 101 will be increased. This increase would be limited to 2 to 3 truck trips per hour during the daytime and would not have a substantial adverse effect on traffic. Staging during construction would extend into the street and cause temporary impacts to traffic. Staging during construction would extend onto Seacliff Drive for the St. Andrews Lift Station site, Ocean Boulevard for the Vista del Mar Lift Station and Ocean Park sites, and Price Street for the Price Street - North and Price Street - South sites. The staging area may result in some traffic delays or diversions on these streets. When construction is finished, the bluff protection structures would not affect traffic. The proposed action would help to protect bluff top streets from erosion.

( ) **Energy consumption or generation:** The use of mechanized equipment during construction of the bluff protection structures would consume fuels. When construction is finished, the proposed action would neither consume nor generate energy.

( ) **Navigation:** The proposed action would affect only the upper intertidal zone. There would be no effects to navigation.

( ) **Safety:** The proposed action would improve safety by protecting critically eroding bluff areas from erosion.

( ) **Air quality:** During construction, equipment would emit air pollutants. These emissions would be below air quality thresholds and would not be significant.

( ) **Noise:** All of the sites except Price Street - North are near sensitive receptors. Noise levels during construction will exceed background levels. When construction is completed, the proposed action would have no noise impacts.

( ) **Historic properties:** The only site with a potential for cultural resources is Ocean Park. Portions of one prehistoric site, CA-SLO-459, are located very close to activities that would be required to construct this alternative. However, with appropriate construction restrictions and archeological monitoring, there would not be any effects to this site.

( ) **Land use classification:** The proposed action would not affect any land use classification.

( ) **Economics:** The proposed action would protect the bluffs at the six critically eroding sites from potential economic losses associated with damage to parks, houses, streets, and utilities.

( ) **Prime and unique farmland (7 CFR Part 658):** The proposed action is not located on any farmland.

( ) **Food and fiber production:** The proposed action would not affect food and fiber protection.

( ) **General water quality:** The proposed action would not affect general water quality.

( ) **Mineral needs:** The proposed action would not affect mineral needs.

( ) **Consideration of private property:** The proposed action would help to protect private homes located on the bluffs near the sites from erosion damage.

( ) **other:**

E. Summary of indirect and cumulative effects from the proposed permit action: The proposed action would have minor effects on air quality and traffic during construction. Construction noise will exceed ambient noise at nearby houses and hotels. Beach use will be interrupted during construction. Wildlife in the vicinity of the construction sites will be disturbed during construction. When construction is completed, a relatively small amount of upper beach and bluff face in the project area will be covered by the structures. The structures will contribute to the cumulative effects of bluff protection structures along the Pismo Bluffs. However, most of the sites have existing ineffective bluff protection structures that would be replaced by properly engineered structures.

F. Other cumulative effects not related to the proposed permit action:

1. Occurred on-site historically: A variety of bluff protection structures have been constructed in the project area. At the six sites, existing ineffective structures will be replaced by properly designed structures.

2. Likely to occur within the foreseeable future: A seawall repair/extension is proposed along Ocean Boulevard. The seawall extension would place new caissons along the edges of the existing seawall to protect against scour.

3. Contextual relationship between the proposed action and (1) and (2) above: The proposed action would replace ineffective bluff protection structures at the sites. Construction of properly designed bluff protection structures would eliminate the need to construct emergency protection structures at the sites and to construct sea wall extensions to protect against scour at the edges of existing structures.

G. Mitigation proposed by applicant:

1. Avoidance, minimization, compensation sequence:

<u>Avoidance of impacts to water quality from equipment spills or leaks during construction:</u>

- The Contractor shall be responsible for the preparation and adherence to a Spill Prevention, Containment and Countermeasures Plan that specifies fueling procedures, equipment maintenance procedures, and containment and cleanup measures to be followed in the event of a spill.
    - Construction and maintenance fluids (oils, antifreeze, fuels) shall be stored in closed containers and disposed of promptly away from the ocean.
    - Fluids released because of spills, equipment failure (broken hose, punctured tank), accident due to waves or refueling should be immediately controlled, contained, and cleaned-up. All contaminated materials should be disposed of promptly away from the ocean. Refueling of equipment shall not occur close to the ocean. If that is not possible, barriers shall be placed around the site.
- The Contractor shall be responsible for the preparation and adherence to a Storm Water Pollution Prevention Plan. This plan shall specify Best Management Practices (BMPs) including collection and storage of all debris away from the ocean and erosion control measures to prevent dirt or construction materials from entering the ocean.

Avoidance of impacts to public safety

- The Contractor shall place warning signs, and temporary fencing around construction areas to keep the public from entering dangerous construction areas.

Avoidance and minimization of impacts to biological resources

- At all sites but Cypress Street Lift Station, before beginning any construction activities on the site, it shall be determined whether any harbor seals are hauled out on the beach. If harbor seals are observed on the beach, no construction activities shall occur until the seals leave the beach.

- A biological monitor shall be present during any construction activities on the site, during the first week. If snowy plovers are observed near the construction area, the monitor will advise the work crews on how to avoid or minimize impacts to plover, which may include temporarily halting activities, until the plovers have left the site. Minimization measures shall continue throughout the site construction.

- At the Price Street - South site, prior to construction of the revetment or sea wall, a survey for La Graciosa thistle should be done of central coastal scrub habitat within the footprint of the structure. If the plant is observed, seeds should be planted in central coastal scrub habitat that will not be disturbed by the construction.

Minimization of impacts to cultural resources

- If cultural resources are discovered prior to or during work and cannot be avoided, work will be suspended in that area until resources are evaluated for eligibility for listing in the NRHP after consultation with the SHPO. If resources are deemed eligible for the NRHP, the effects of the project will be taken into consideration in consultation with the SHPO. The Advisory Council on Historic Preservation (ACHP) will be provided an opportunity to comment in accordance with 36 CFR 800.13.

Minimization of impacts to noise:

- Temporary noise barriers shall be installed at the St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, Price Street – South, and Cypress Street Lift Station sites to reduce noise. The barriers should be placed in-between adjacent and nearby houses and the construction staging areas as well as project construction areas wherever feasible. Barrier height should be at least 8 feet, where adjacent to single story houses, and 16 feet in height, where adjacent to two-story houses. The temporary noise barrier shall capable of attenuating maximum noise events by up to 32 dBA to achieve City Noise Ordinance standards.

- The City shall notify all residents and businesses within 100 feet of the construction staging site for each site of the construction schedule.

- The City shall set up a hotline for noise complaints associated with the proposed project. All noise complaints shall be investigated, construction noise shall be measured at the site and the effectiveness of the temporary noise barrier shall be re-evaluated.

Minimization of impacts to traffic

- At the St. Andrews Lift Station site, signs and persons to direct traffic shall be placed on Seacliff Drive at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s).

- At the Vista del Mar Lift Station and Ocean Park sites, signs and persons to direct traffic shall be placed on Ocean Boulevard at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s).

- At the Price Street - North and Price Street - South sites, signs and notices shall be posted warning of the dates and times that Price Street will be closed. The notices shall include identification of alternate routes.

- At the Price Street - North and Price Street - South sites, signs and persons to direct traffic shall be placed on Price Street at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s) or safely turn around and proceed to the detour.

Minimization of impacts to utilities

- At the Price Street - North, Price Street - South, and Cypress Street Lift Station sites, the construction contractor shall inform all parties that would be affected by the interruption in electrical service of the date and time that electrical service would be interrupted. The contractor shall work with affected parties to minimize duration of the interruption and any problems that may be caused by the interruption.

Compensation for impacts to biological resources

- Revetment alternative for the Cypress Street Lift Station only: After construction of the revetment, the buried portion of the revetment and the additional area disturbed by construction equipment as well as adjacent areas, if necessary, shall be revegetated with native dune vegetation

2. Summary of why applicant's proposal does or does not reduce impacts to below significance: The only potentially significant impacts of the proposed action are temporary impacts during construction. With the proposed avoidance and minimization measures, these temporary impacts either will be avoided or will be reduced to below significance.

IV. FINDINGS:

A. Status of other authorizations and legal requirements:

1. Water quality certification: The Corps will apply to the Regional Water Quality Control Board for Water Quality Certification under Section 401 of the Clean Water Act.

2. Coastal zone management consistency determination: As a Federal agency, the Los Angeles District, U.S. Army Corps of Engineers (Corps) is responsible for ensuring project compliance with the federal Coastal Zone Management Act of 1972 (CZMA). Section 307 of the CZMA [Title 16, U.S. Code Section 1456(c)] states that Federal Actions must be consistent with approved state coastal management programs to the maximum extent practicable. The California Coastal Act is this state's approved coastal management program applicable to the Proposed Project. To document the degree of consistency with the state program, the CZMA requires the preparation of a Consistency Determination (CD) whenever a project could directly affect the coastal zone. The CD provides a description of the Proposed Project, discusses the proposed project's consistency, and where applicable, describes measures, which when implemented, will result in project consistency with state policies to the maximum extent practicable.

The Corps has completed a Draft Environmental Assessment which: 1) identifies and discusses the problems and needs related to this action, 2) evaluates alternatives, and 3) addresses the impacts of the proposed project and alternatives as part of the decision process. The determination of

consistency with the California Coastal Act is based on the analysis performed for this EA. The EA was prepared in compliance with the Council on Environmental Quality (CEQ) Regulations (40 C.F.R. 1500-1508) and the procedural provisions of Section 102(2) (c) of the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321, as amended. The NEPA was used as a measure for assessing the magnitude of project impacts.

The Los Angeles District has determined that the proposed project is consistent, to the maximum extent practicable, with the Coastal Zone Management Act of 1972.

3. Compliance with Section 106 of the National Historic Preservation Act: A records and literature search and field survey of the area of APE was conducted. No sites eligible for listing on the National Register of Historic Places would be affected by this undertaking. The Corps will transmit the results of the Corps investigations to the SHPO for review. Once the SHPO concurs with this determination the project will be in compliance with the act as implemented by 36 CFR 800.

4. Compliance with the Endangered Species Act: Section 7(c) of the Endangered Species Act requires consultation with the USFWS or National Marine Fisheries Service to determine if a Federal Action will affect threatened or endangered wildlife species, and to ensure that any action does not jeopardize the continued existence of, or result in the destruction of the habitat of, any endangered or threatened species. A species list was requested from the USFWS and NOAA Fisheries. This project has a may effect, but not likely to adversely effect determination for potential construction impacts to snowy plover; it will not affect other listed species or critical habitat; therefore, informal consultation is requested. This project is in compliance with the ESA.

5. Compliance with Section 176(c)(General Conformity Rule review) of the Clean Air Act: The potential air quality impacts of the proposed project has been examined and compared to the significance levels identified by the San Luis Obispo Air Pollution Control District (SLOAPCD). No additional significant short- or long-term adverse impacts to local or regional air quality are anticipated that have not already been addressed in prior NEPA documents for the area. The draft EA will be sent to the SLOAPCD for comment during the public review period.

6. State and/or local authorizations:

a. California Environmental Quality Act (CEQA)

CEQA requires state and local agencies to disclose and consider the environmental implications of their actions. It further requires that agencies, when feasible, avoid or reduce the significant environmental impacts of their decisions. The EA meets the goals, policies, and requirements of CEQA. Information and analysis to meet CEQA requirements are included within the EA for each resource. An Initial Study Checklist was completed and is attached as Appendix E to the EA.

b. Porter-Cologne Water Quality Control Act of 1967

The Porter-Cologne Water Quality Act extends to all “waters of the State,” including surface and subsurface waters, and saline waters. This act requires anyone proposing to discharge waste within any region of the State to comply with requirements established by the regional Basin Plans. The Regional Boards also must comply with the CWA anti-degradation policy. The proposed action, with the above environmental commitments, will be in compliance with this Act.

c. California Clean Air Act (CCAA)

Similar to the federal counterpart, the potential air quality impacts of the proposed project has

been examined and compared to the significance levels identified by the SLOAPCD. No additional significant short- or long-term adverse impacts to local or regional air quality are anticipated that have not already been addressed in prior NEPA documents for the area. The draft EA will be sent to the SLOAPCD for comment during the public review period.

d. California Endangered Species Act (CESA)

The California Endangered Species Act (CESA) parallels FESA. As a responsible agency, the CDFG has regulatory authority over state-listed endangered and threatened species. Since the proposed project may affect species that are listed as threatened or endangered under both the state and federal Endangered Species Acts and, since the project is subject to CEQA review and federal review pursuant to NEPA, the CDFG shall participate to the greatest extent practicable in the federal endangered species consultation. The state legislature encourages cooperative and simultaneous findings between state and federal agencies. Further, the General Counsel for the CDFG has issued a memorandum to CDFG regional managers and division chiefs clarifying the CESA consultation process wherein, if a federal Biological Opinion has been prepared for a species, the CDFG must use this Biological Opinion in lieu of its own findings unless it is inconsistent with CESA. CDFG Code Section 2095 authorizes participation in federal consultation and adoption of a federal Biological Opinion. By adopting the federal Biological Opinion, the CDFG need not issue a taking permit per Section 2081 of the state Code. If the Biological Opinion is consistent with CESA, the CDFG will complete a 2095 form in finalizing the adoption of the Biological Opinion. If the federal Biological Opinion is found to be inconsistent with CESA, the CDFG will issue its own Biological Opinion per Section 2090 of the state Code and may issue a 2081 take permit with conditions of approval. The proposed project would comply with this Act.

e. California Coastal Act of 1976

The Act specifies basic goals for coastal conservation and development related to protection, enhancement and restoration of coastal resources, giving priority to “coastal-dependent” uses and maximizing public access to California residents and visitors. The Act defines the “coastal zone” of California, which generally extends three miles out to sea and inland generally 1,000 yards. Each city and county in California which is on the coast must prepare a Local Coastal Program (LCP) for all areas within the coastal zone. The LCP includes Land Use Plans, zoning ordinance amendments and map changes to reflect the Coastal Act and LCP goals and policies at the local level. The proposed project is expected to have no significant adverse effect on the coastal zone of California and is consistent, as applicable, with state water quality standards and with California’s federally approved Coastal Zone Management.

APPENDIX C – AIR QUALITY CALCULATIONS

CHAMBERS GROUP

Air Quality/Climate Change Calculations

Cypress

Alternative #1 - Rock Revetment

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030	342.04
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001	40.93
Fugitive Dust	----	----	----	2.10	----	----	----	----	0.096	----	----
TOTAL	***8.52***	***32.67***	***92.64***	***5.08***	***2.93***	***0.085***	***0.301***	***0.715***	***0.127***	***0.030***	***382.98***

Alternative #4 - Steel Sheetpile Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	8.00	26.92	66.14	3.98	3.94	0.122	0.409	1.006	0.061	0.060	461.65
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000	24.86
Fugitive Dust	----	----	----	0.27	----	----	----	----	0.012	----	----
TOTAL	***9.47***	***36.07***	***105.73***	***4.63***	***4.29***	***0.123***	***0.430***	***1.043***	***0.073***	***0.060***	***486.51***

Air Quality/Climate Change Calculations

Price Street - South

Alternative #1 - Rock Revetment

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.135	0.453	1.041	0.050	0.049	570.07
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001	32.25
Fugitive Dust	----	----	----	0.23	----	----	----	----	0.011	----	----
TOTAL	***8.52***	***32.67***	***92.64***	***3.21***	***2.93***	***0.139***	***0.482***	***1.132***	***0.061***	***0.050***	***602.32***

Alternative #2 - Vertical Concrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.180	0.604	1.561	0.089	0.088	744.92
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000	32.25
Fugitive Dust	----	----	----	0.17	----	----	----	----	0.008	----	----
TOTAL	***8.24***	***31.85***	***98.23***	***3.87***	***3.64***	***0.182***	***0.625***	***1.598***	***0.097***	***0.088***	***777.18***

Alternative #3 - Sculpted Concrete Shotcrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.255	0.888	2.171	0.123	0.122	984.39
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.002	0.042	0.024	0.001	0.001	41.41
Fugitive Dust	----	----	----	0.14	----	----	----	----	0.007	----	----
TOTAL	***10.38***	***41.78***	***125.47***	***4.70***	***4.48***	***0.256***	***0.930***	***2.195***	***0.130***	***0.122***	***1,025.80***

Air Quality/Climate Change Calculations

Price Street - North

Alternative #1 - Rock Revetment

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.135	0.453	1.041	0.050	0.049	744.92
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001	25.56
Fugitive Dust	----	----	----	0.56	----	----	----	----	0.026	----	----
TOTAL	***8.52***	***32.67***	***92.64***	***3.55***	***2.93***	***0.139***	***0.482***	***1.132***	***0.077***	***0.050***	***770.48***

Alternative #2 - Vertical Concrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.180	0.604	1.561	0.089	0.088	744.92
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000	35.13
Fugitive Dust	----	----	----	0.23	----	----	----	----	0.010	----	----
TOTAL	***8.24***	***31.85***	***98.23***	***3.93***	***3.64***	***0.182***	***0.625***	***1.598***	***0.099***	***0.088***	***780.05***

Alternative #3 - Sculpted Concrete Shotcrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.255	0.888	2.171	0.123	0.122	984.39
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.002	0.043	0.032	0.001	0.001	44.04
Fugitive Dust	----	----	----	0.20	----	----	----	----	0.009	----	----
TOTAL	***10.38***	***41.78***	***125.47***	***4.76***	***4.48***	***0.257***	***0.932***	***2.203***	***0.133***	***0.122***	***1,028.43***

Air Quality/Climate Change Calculations

St. Andrews Lift Station (Memory Park)

Alternative #1 - Rock Revetment

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030	342.04
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001	13.61
Fugitive Dust	----	----	----	0.43	----	----	----	----	0.020	----	----
TOTAL	***8.52***	***32.67***	***92.64***	***3.42***	***2.93***	***0.085***	***0.301***	***0.715***	***0.051***	***0.030***	***355.65***

Alternative #2 - Vertical Concrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.103	0.345	0.892	0.051	0.050	425.67
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000	18.46
Fugitive Dust	----	----	----	0.11	----	----	----	----	0.005	----	----
TOTAL	***8.24***	***31.85***	***98.23***	***3.81***	***3.64***	***0.105***	***0.366***	***0.929***	***0.056***	***0.051***	***444.14***

Alternative #3 - Sculpted Concrete Shotcrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.159	0.555	1.357	0.077	0.076	615.24
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.001	0.026	0.014	0.000	0.000	25.52
Fugitive Dust	----	----	----	0.09	----	----	----	----	0.004	----	----
TOTAL	***10.38***	***41.78***	***125.47***	***4.65***	***4.48***	***0.160***	***0.581***	***1.371***	***0.081***	***0.076***	***640.76***

Air Quality/Climate Change Calculations

Vista del Mar

Alternative #1 - Rock Revetment

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030	342.04
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001	14.09
Fugitive Dust	----	----	----	0.41	----	----	----	----	0.019	----	----
TOTAL	***8.52***	***32.67***	***92.64***	***3.39***	***2.93***	***0.085***	***0.301***	***0.715***	***0.050***	***0.030***	***356.13***

Alternative #2 - Vertical Concrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.103	0.345	0.892	0.051	0.050	425.67
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000	17.99
Fugitive Dust	----	----	----	0.11	----	----	----	----	0.005	----	----
TOTAL	***8.24***	***31.85***	***98.23***	***3.81***	***3.64***	***0.105***	***0.366***	***0.929***	***0.056***	***0.051***	***443.66***

Alternative #3 - Sculpted Concrete Shotcrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.159	0.555	1.357	0.077	0.076	615.24
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.001	0.025	0.013	0.000	0.000	25.04
Fugitive Dust	----	----	----	0.09	----	----	----	----	0.004	----	----
TOTAL	***10.38***	***41.78***	***125.47***	***4.65***	***4.48***	***0.160***	***0.581***	***1.370***	***0.081***	***0.076***	***640.28***

Air Quality/Climate Change Calculations

Ocean Park (Capistrano)

Alternative #1 - Rock Revetment

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	7.12	23.85	54.77	2.62	2.60	0.081	0.272	0.625	0.030	0.030	342.04
On-road Vehicles	1.40	8.81	37.87	0.36	0.33	0.003	0.029	0.090	0.001	0.001	15.29
Fugitive Dust	----	----	----	0.48	----	----	----	----	0.022	----	----
TOTAL	***8.52***	***32.67***	***92.64***	***3.47***	***2.93***	***0.085***	***0.301***	***0.715***	***0.053***	***0.030***	***357.33***

Alternative #2 - Vertical Concrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	6.77	22.71	58.64	3.33	3.29	0.103	0.345	0.892	0.051	0.050	425.67
On-road Vehicles	1.47	9.14	39.59	0.37	0.34	0.002	0.021	0.037	0.000	0.000	18.94
Fugitive Dust	----	----	----	0.14	----	----	----	----	0.007	----	----
TOTAL	***8.24***	***31.85***	***98.23***	***3.85***	***3.64***	***0.105***	***0.366***	***0.929***	***0.058***	***0.051***	***444.61***

Alternative #3 - Sculpted Concrete Shotcrete Wall

Source	Emissions (lb/d)					Emissions (t/q)					CO_2e (tonne)
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	
Off-road Construction Equipment	8.38	29.21	71.37	4.04	4.00	0.159	0.555	1.357	0.077	0.076	615.24
On-road Vehicles	2.00	12.57	54.09	0.51	0.47	0.001	0.026	0.016	0.000	0.000	26.00
Fugitive Dust	----	----	----	0.12	----	----	----	----	0.005	----	----
TOTAL	***10.38***	***41.78***	***125.47***	***4.67***	***4.48***	***0.160***	***0.581***	***1.372***	***0.083***	***0.076***	***641.24***

Summary by Alternative - Construction Off-road

Alternative #1 - Rock Revetment

Site	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
Cypress	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
Price Street - South	7.1	23.9	54.8	2.6	7,725	0.14	0.45	1.04	0.05	146.8
Price Street - North	7.1	23.9	54.8	2.6	7,725	0.14	0.45	1.04	0.05	146.8
St Andrews Lift Station	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
Vista del Mar	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
Ocean Park	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
TOTAL	***42.4***	***142.0***	***332.5***	***16.4***	***45,833***	***0.62***	***2.07***	***4.85***	***0.24***	***667.7***

Alternative #2 - Vertical Concrete Wall

Site	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
Cypress	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Price Street - South	6.8	22.7	58.6	3.3	7,210	0.18	0.60	1.56	0.09	191.9
Price Street - North	6.8	22.7	58.6	3.3	7,210	0.18	0.60	1.56	0.09	191.9
St Andrews Lift Station	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
Vista del Mar	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
Ocean Park	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
TOTAL	***33.9***	***113.5***	***293.2***	***16.6***	***36,050***	***0.67***	***2.24***	***5.80***	***0.33***	***712.7***

Alternative #3 - Sculpted Concrete Shotcrete Wall

Site	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
Cypress	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Price Street - South	8.4	29.2	71.4	4.0	8,337	0.25	0.89	2.17	0.12	253.6
Price Street - North	8.4	29.2	71.4	4.0	8,337	0.25	0.89	2.17	0.12	253.6
St Andrews Lift Station	8.4	29.2	71.4	4.0	8,337	0.16	0.56	1.36	0.08	158.5
Vista del Mar	8.4	29.2	71.4	4.0	8,337	0.16	0.56	1.36	0.08	158.5
Ocean Park	8.4	29.2	71.4	4.0	8,337	0.16	0.56	1.36	0.08	158.5
TOTAL	***41.9***	***146.0***	***356.9***	***20.2***	***41,684***	***0.99***	***3.44***	***8.41***	***0.48***	***982.6***

Alternative #4 - Steel Sheetpile Wall

Site	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
Cypress	8.0	26.9	66.1	4.0	7,819	0.12	0.41	1.01	0.06	118.9
Price Street - South	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Price Street - North	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
St Andrews Lift Station	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vista del Mar	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ocean Park	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	***8.0***	***26.9***	***66.1***	***4.0***	***7,819***	***0.12***	***0.41***	***1.01***	***0.06***	***118.9***

Summary by Site - Construction Off-road

Cypress

Alternative	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
#1 - Rock Revetment	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
#4 - Steel Sheetpile Wall	8.0	26.9	66.1	4.0	7,819	0.12	0.41	1.01	0.06	118.9

Price Street - South

Alternative	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
#1 - Rock Revetment	7.1	23.9	54.8	2.6	7,725	0.14	0.45	1.04	0.05	146.8
#2 - Vertical Concrete Wall	6.8	22.7	58.6	3.3	7,210	0.18	0.60	1.56	0.09	191.9
#2 - Sculpted Concrete Shotcrete Wall	8.4	29.2	71.4	4.0	8,337	0.25	0.89	2.17	0.12	253.6

Price Street - North

Alternative	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
#1 - Rock Revetment	7.1	23.9	54.8	2.6	7,725	0.14	0.45	1.04	0.05	146.8
#2 - Vertical Concrete Wall	6.8	22.7	58.6	3.3	7,210	0.18	0.60	1.56	0.09	191.9
#2 - Sculpted Concrete Shotcrete Wall	8.4	29.2	71.4	4.0	8,337	0.25	0.89	2.17	0.12	253.6

St. Andrews Lift Station

Alternative	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
#1 - Rock Revetment	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
#2 - Vertical Concrete Wall	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
#2 - Sculpted Concrete Shotcrete Wall	8.4	29.2	71.4	4.0	8,337	0.16	0.56	1.36	0.08	158.5

Vista del Mar

Alternative	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
#1 - Rock Revetment	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
#2 - Vertical Concrete Wall	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
#2 - Sculpted Concrete Shotcrete Wall	8.4	29.2	71.4	4.0	8,337	0.16	0.56	1.36	0.08	158.5

Ocean Park

Alternative	Emissions (lb/d)					Emissions (t/q)				
	ROG	CO	NO_X	PM	CO_2	ROG	CO	NO_X	PM	CO_2
#1 - Rock Revetment	7.1	23.9	54.8	2.6	7,725	0.08	0.27	0.62	0.03	88.1
#2 - Vertical Concrete Wall	6.8	22.7	58.6	3.3	7,210	0.10	0.35	0.89	0.05	109.7
#2 - Sculpted Concrete Shotcrete Wall	8.4	29.2	71.4	4.0	8,337	0.16	0.56	1.36	0.08	158.5

Cypress - Off Road Emissions

Alt 1 - Rock Revetment

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	3	12	1,095	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.019	0.070	0.019	0.007	19.04
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
excavator	400	0.57	3	12	1,095	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.019	0.059	0.184	0.007	22.31
concrete pump truck	300	0.57	3	12	1,095	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.015	0.046	0.147	0.005	16.73
										Totals	***7.12***	***23.85***	***54.77***	***2.62***	***7724.7***	***0.081***	***0.272***	***0.625***	***0.030***	***88.11***

Alt 4 - Steel Sheet

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	4	12	1,460	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.026	0.093	0.026	0.010	25.39
loader/forklift	300	0.60	4	12	1,460	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.020	0.066	0.336	0.019	24.30
excavator	400	0.57	4	12	1,460	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.025	0.078	0.245	0.009	29.74
welding machine	100	0.45	4	12	1,460	0.518	1.770	3.152	0.275	255.965	0.62	2.11	3.75	0.33	304.7	0.009	0.032	0.057	0.005	4.63
welding machine	100	0.45	4	12	1,460	0.518	1.770	3.152	0.275	255.965	0.62	2.11	3.75	0.33	304.7	0.009	0.032	0.057	0.005	4.63
compressor	150	0.48	4	12	1,460	0.389	1.575	3.086	0.174	273.029	0.74	3.00	5.88	0.33	520.1	0.011	0.046	0.089	0.005	7.91
concrete pump truck	300	0.57	4	12	1,460	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.020	0.062	0.196	0.007	22.31
										Totals	***8.00***	***26.92***	***66.14***	***3.98***	***7819.5***	***0.122***	***0.409***	***1.006***	***0.061***	***118.92***

Price Street South - Off Road Emissions

Alt 1 - Rock Revetment

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	5	12	1,825	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.032	0.117	0.032	0.012	31.74
loader	300	0.54	5	12	1,825	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.023	0.081	0.229	0.009	25.03
loader	300	0.54	5	12	1,825	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.023	0.081	0.229	0.009	25.03
excavator	400	0.57	5	12	1,825	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.032	0.098	0.307	0.011	37.18
concrete pump truck	300	0.57	5	12	1,825	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.026	0.077	0.245	0.009	27.88
										Totals	***7.12***	***23.85***	***54.77***	***2.62***	***7724.7***	***0.135***	***0.453***	***1.041***	***0.050***	***146.85***

Alt 2 - Vertical Concrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	7	12	2,555	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.045	0.163	0.045	0.017	44.43
loader/forklift	300	0.60	7	12	2,555	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.035	0.116	0.587	0.034	42.53
excavator	400	0.57	7	12	2,555	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.044	0.137	0.429	0.016	52.05
compressor	150	0.48	7	12	2,555	0.389	1.575	3.086	0.174	273.029	0.74	3.00	5.88	0.33	520.1	0.020	0.080	0.156	0.009	13.84
concrete pump truck	300	0.57	7	12	2,555	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.036	0.108	0.343	0.013	39.04
										Totals	***6.77***	***22.71***	***58.64***	***3.33***	***7210.0***	***0.180***	***0.604***	***1.561***	***0.089***	***191.89***

Air Quality/Climate Change Calculations

Alt 3 - Sculpted Concrete Shotcrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	8	12	2,920	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.052	0.187	0.051	0.020	50.78
loader/forklift	300	0.60	8	12	2,920	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.040	0.132	0.671	0.039	48.61
excavator	400	0.57	8	12	2,920	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.050	0.157	0.491	0.018	59.48
compressor	400	0.57	8	12	2,920	0.389	1.575	3.086	0.174	273.029	2.35	9.50	18.61	1.05	1,646.9	0.071	0.289	0.566	0.032	50.09
concrete pump truck	300	0.57	8	12	2,920	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.041	0.124	0.391	0.014	44.61
										Totals	***8.38***	***29.21***	***71.37***	***4.04***	***8336.8***	***0.255***	***0.888***	***2.171***	***0.123***	***253.58***

Price Street North - Off Road Emissions

Alt 1 - Rock Revetment

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	5	12	1,825	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.032	0.117	0.032	0.012	31.74
loader	300	0.54	5	12	1,825	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.023	0.081	0.229	0.009	25.03
loader	300	0.54	5	12	1,825	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.023	0.081	0.229	0.009	25.03
excavator	400	0.57	5	12	1,825	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.032	0.098	0.307	0.011	37.18
concrete pump truck	300	0.57	5	12	1,825	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.026	0.077	0.245	0.009	27.88
										Totals	***7.12***	***23.85***	***54.77***	***2.62***	***7724.7***	***0.135***	***0.453***	***1.041***	***0.050***	***146.85***

Alt 2 - Vertical Concrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	7	12	2,555	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.045	0.163	0.045	0.017	44.43
loader/forklift	300	0.60	7	12	2,555	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.035	0.116	0.587	0.034	42.53
excavator	400	0.57	7	12	2,555	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.044	0.137	0.429	0.016	52.05
compressor	150	0.48	7	12	2,555	0.389	1.575	3.086	0.174	273.029	0.74	3.00	5.88	0.33	520.1	0.020	0.080	0.156	0.009	13.84
concrete pump truck	300	0.57	7	12	2,555	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.036	0.108	0.343	0.013	39.04
										Totals	***6.77***	***22.71***	***58.64***	***3.33***	***7210.0***	***0.180***	***0.604***	***1.561***	***0.089***	***191.89***

Alt 3 - Sculpted Concrete Shotcrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	8	12	2,920	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.052	0.187	0.051	0.020	50.78
loader/forklift	300	0.60	8	12	2,920	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.040	0.132	0.671	0.039	48.61
excavator	400	0.57	8	12	2,920	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.050	0.157	0.491	0.018	59.48
compressor	400	0.57	8	12	2,920	0.389	1.575	3.086	0.174	273.029	2.35	9.50	18.61	1.05	1,646.9	0.071	0.289	0.566	0.032	50.09
concrete pump truck	300	0.57	8	12	2,920	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.041	0.124	0.391	0.014	44.61
										Totals	***8.38***	***29.21***	***71.37***	***4.04***	***8336.8***	***0.255***	***0.888***	***2.171***	***0.123***	***253.58***

St. Andrews Lift Station - Off Road Emissions

Alt 1 - Rock Revetment

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	3	12	1,095	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.019	0.070	0.019	0.007	19.04
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
excavator	400	0.57	3	12	1,095	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.019	0.059	0.184	0.007	22.31
concrete pump truck	300	0.57	3	12	1,095	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.015	0.046	0.147	0.005	16.73
										Totals	***7.12***	***23.85***	***54.77***	***2.62***	***7724.7***	***0.081***	***0.272***	***0.625***	***0.030***	***88.11***

Alt 2 - Vertical Concrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	4	12	1,460	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.026	0.093	0.026	0.010	25.39
loader/forklift	300	0.60	4	12	1,460	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.020	0.066	0.336	0.019	24.30
excavator	400	0.57	4	12	1,460	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.025	0.078	0.245	0.009	29.74
compressor	150	0.48	4	12	1,460	0.389	1.575	3.086	0.174	273.029	0.74	3.00	5.88	0.33	520.1	0.011	0.046	0.089	0.005	7.91
concrete pump truck	300	0.57	4	12	1,460	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.020	0.062	0.196	0.007	22.31
										Totals	***6.77***	***22.71***	***58.64***	***3.33***	***7210.0***	***0.103***	***0.345***	***0.892***	***0.051***	***109.65***

Air Quality/Climate Change Calculations

Alt 3 - Sculpted Concrete Shotcrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	5	12	1,825	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.032	0.117	0.032	0.012	31.74
loader/forklift	300	0.60	5	12	1,825	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.025	0.083	0.420	0.024	30.38
excavator	400	0.57	5	12	1,825	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.032	0.098	0.307	0.011	37.18
compressor	400	0.57	5	12	1,825	0.389	1.575	3.086	0.174	273.029	2.35	9.50	18.61	1.05	1,646.9	0.045	0.181	0.354	0.020	31.31
concrete pump truck	300	0.57	5	12	1,825	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.026	0.077	0.245	0.009	27.88
										Totals	***8.38***	***29.21***	***71.37***	***4.04***	***8336.8***	***0.159***	***0.555***	***1.357***	***0.077***	***158.49***

Vista del Mar - Off Road Emissions

Alt 1 - Rock Revetment

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	3	12	1,095	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.019	0.070	0.019	0.007	19.04
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
excavator	400	0.57	3	12	1,095	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.019	0.059	0.184	0.007	22.31
concrete pump truck	300	0.57	3	12	1,095	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.015	0.046	0.147	0.005	16.73
										Totals	***7.12***	***23.85***	***54.77***	***2.62***	***7724.7***	***0.081***	***0.272***	***0.625***	***0.030***	***88.11***

Alt 2 - Vertical Concrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	4	12	1,460	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.026	0.093	0.026	0.010	25.39
loader/forklift	300	0.60	4	12	1,460	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.020	0.066	0.336	0.019	24.30
excavator	400	0.57	4	12	1,460	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.025	0.078	0.245	0.009	29.74
compressor	150	0.48	4	12	1,460	0.389	1.575	3.086	0.174	273.029	0.74	3.00	5.88	0.33	520.1	0.011	0.046	0.089	0.005	7.91
concrete pump truck	300	0.57	4	12	1,460	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.020	0.062	0.196	0.007	22.31
										Totals	***6.77***	***22.71***	***58.64***	***3.33***	***7210.0***	***0.103***	***0.345***	***0.892***	***0.051***	***109.65***

Air Quality/Climate Change Calculations

Alt 3 - Sculpted Concrete Shotcrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	5	12	1,825	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.032	0.117	0.032	0.012	31.74
loader/forklift	300	0.60	5	12	1,825	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.025	0.083	0.420	0.024	30.38
excavator	400	0.57	5	12	1,825	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.032	0.098	0.307	0.011	37.18
compressor	400	0.57	5	12	1,825	0.389	1.575	3.086	0.174	273.029	2.35	9.50	18.61	1.05	1,646.9	0.045	0.181	0.354	0.020	31.31
concrete pump truck	300	0.57	5	12	1,825	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.026	0.077	0.245	0.009	27.88
										Totals	***8.38***	***29.21***	***71.37***	***4.04***	***8336.8***	***0.159***	***0.555***	***1.357***	***0.077***	***158.49***

Ocean Park - Off Road Emissions

Alt 1 - Rock Revetment

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	3	12	1,095	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.019	0.070	0.019	0.007	19.04
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
loader	300	0.54	3	12	1,095	0.282	0.991	2.810	0.106	307.158	1.21	4.25	12.04	0.45	1,316.4	0.014	0.048	0.137	0.005	15.02
excavator	400	0.57	3	12	1,095	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.019	0.059	0.184	0.007	22.31
concrete pump truck	300	0.57	3	12	1,095	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.015	0.046	0.147	0.005	16.73
										Totals	***7.12***	***23.85***	***54.77***	***2.62***	***7724.7***	***0.081***	***0.272***	***0.625***	***0.030***	***88.11***

Alt 2 - Vertical Concrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	4	12	1,460	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.026	0.093	0.026	0.010	25.39
loader/forklift	300	0.60	4	12	1,460	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.020	0.066	0.336	0.019	24.30
excavator	400	0.57	4	12	1,460	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.025	0.078	0.245	0.009	29.74
compressor	150	0.48	4	12	1,460	0.389	1.575	3.086	0.174	273.029	0.74	3.00	5.88	0.33	520.1	0.011	0.046	0.089	0.005	7.91
concrete pump truck	300	0.57	4	12	1,460	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.020	0.062	0.196	0.007	22.31
										Totals	***6.77***	***22.71***	***58.64***	***3.33***	***7210.0***	***0.103***	***0.345***	***0.892***	***0.051***	***109.65***

Air Quality/Climate Change Calculations

Alt 3 - Sculpted Concrete Shotcrete Wall

Equipment						Emission Factors (g/bhp-hr)					Emissions (lbs/d)					Emissions (tpq)				
Type	BHP	Load Factor	Months	hrs/ day	total hrs/yr	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2	ROG	CO	NO_x	PM	CO_2
truck crane	600	0.43	5	12	1,825	0.249	0.899	0.247	0.094	244.589	1.70	6.14	1.68	0.64	1,669.4	0.032	0.117	0.032	0.012	31.74
loader/forklift	300	0.60	5	12	1,825	0.279	0.914	4.635	0.269	335.598	1.33	4.35	22.07	1.28	1,598.1	0.025	0.083	0.420	0.024	30.38
excavator	400	0.57	5	12	1,825	0.275	0.855	2.675	0.099	324.222	1.66	5.16	16.14	0.60	1,955.7	0.032	0.098	0.307	0.011	37.18
compressor	400	0.57	5	12	1,825	0.389	1.575	3.086	0.174	273.029	2.35	9.50	18.61	1.05	1,646.9	0.045	0.181	0.354	0.020	31.31
concrete pump truck	300	0.57	5	12	1,825	0.297	0.898	2.845	0.105	324.222	1.34	4.06	12.87	0.48	1,466.7	0.026	0.077	0.245	0.009	27.88
										Totals	***8.38***	***29.21***	***71.37***	***4.04***	***8336.8***	***0.159***	***0.555***	***1.357***	***0.077***	***158.49***

2010 Offroad Emission Factors (g/hp/hr)

Veh Type	BHP	Load Factor	Emission Factor (g/bhp-hr)				
			ROG	CO	NOX	PM	CO2
Compressor	150	0.48	0.389	1.575	3.086	0.174	273.029
Concrete Pump truck	300	0.57	0.297	0.898	2.845	0.105	324.222
Excavator	400	0.57	0.275	0.855	2.675	0.099	324.222
Loader (rubber tired)	300	0.54	0.282	0.991	2.810	0.106	307.158
Forklift (rough terrain)	300	0.6	0.279	0.914	4.635	0.269	335.598
Truck Crane	600	0.43	0.249	0.899	0.247	0.094	244.589
Welding Machine	100	0.45	0.518	1.770	3.152	0.275	255.965

From: URBEMIS Users Manual Appendices G & I

Summary by Site - Construction On-road Truck Emissions

Cypress

Alternative	Emissions (lb/d)					Emissions (t/q)					Total metric tonnes		
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
#1 - Rock Revetment	1.40	8.81	37.87	0.36	0.33	0.00	0.03	0.09	0.00	0.00	41.7	0.001	40.9
#4 - Steel Sheetpile Wall	1.47	9.14	39.59	0.37	0.34	0.00	0.02	0.04	0.00	0.00	26.1	0.001	24.9

Price Street - South

Alternative	Emissions (lb/d)					Emissions (t/q)					Total metric tonnes		
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
#1 - Rock Revetment	0.61	4.28	16.30	0.16	0.15	0.00	0.02	0.02	0.00	0.00	23.3	0.001	21.7
#2 - Vertical Concrete Wall	2.00	12.39	54.07	0.51	0.47	0.00	0.03	0.02	0.00	0.00	34.9	0.002	32.3
#3 - Sculpted Concrete/Shotcrete Wall	2.00	12.57	54.09	0.51	0.47	0.00	0.04	0.02	0.00	0.00	44.9	0.002	41.4

Price Street - North

Alternative	Emissions (lb/d)					Emissions (t/q)					Total metric tonnes		
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
#1 - Rock Revetment	0.61	4.28	16.30	0.16	0.15	0.00	0.02	0.03	0.00	0.00	27.1	0.001	25.6
#2 - Vertical Concrete Wall	2.00	12.39	54.07	0.51	0.47	0.00	0.03	0.03	0.00	0.00	37.7	0.002	35.1
#3 - Sculpted Concrete Shotcrete Wall	2.00	12.57	54.09	0.51	0.47	0.00	0.04	0.03	0.00	0.00	47.5	0.002	44.0

St. Andrews Lift Station (Memory Park)

Alternative	Emissions (lb/d)					Emissions (t/q)					Total metric tonnes		
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
#1 - Rock Revetment	0.61	4.28	16.30	0.16	0.15	0.00	0.01	0.01	0.00	0.00	14.5	0.001	13.6
#2 - Vertical Concrete Wall	2.00	12.39	54.07	0.51	0.47	0.00	0.02	0.01	0.00	0.00	20.0	0.001	18.5
#3 - Sculpted Concrete Shotcrete Wall	2.00	12.57	54.09	0.51	0.47	0.00	0.03	0.01	0.00	0.00	27.7	0.001	25.5

Vista del Mar

Alternative	Emissions (lb/d)					Emissions (t/q)					Total metric tonnes		
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
#1 - Rock Revetment	0.61	4.28	16.30	0.16	0.15	0.00	0.01	0.01	0.00	0.00	15.0	0.001	14.1
#2 - Vertical Concrete Wall	2.00	12.39	54.07	0.51	0.47	0.00	0.02	0.01	0.00	0.00	19.5	0.001	18.0
#3 - Sculpted Concrete Shotcrete Wall	2.00	12.57	54.09	0.51	0.47	0.00	0.03	0.01	0.00	0.00	27.2	0.001	25.0

Ocean Park (Capistrano)

Alternative	Emissions (lb/d)					Emissions (t/q)					Total metric tonnes		
	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
#1 - Rock Revetment	0.61	4.28	16.30	0.16	0.15	0.00	0.01	0.02	0.00	0.00	16.2	0.001	15.3
#2 - Vertical Concrete Wall	2.00	12.39	54.07	0.51	0.47	0.00	0.02	0.01	0.00	0.00	20.4	0.001	18.9
#3 - Sculpted Concrete Shotcrete Wall	2.00	12.57	54.09	0.51	0.47	0.00	0.03	0.02	0.00	0.00	28.2	0.001	26.0

Employee Trips - Construction On-road Emissions

By Site

Cypress

Alternative	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr
Alt 1 - Rock Revetment	10	3	91	20	10	200	18,250
Alt 4 - Steel Sheetpile Wall	10	4	122	20	10	200	24,333

Criteria Emissions

Pounds per day					Tons per quarter				
ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000
0.02	0.88	0.13	0.01	0.01	0.000	0.013	0.002	0.000	0.000

GHG

CO_2	NH_3	CO_2e
tpy	tpy	MT/Y
10.2	0.001	9.3
13.6	0.001	12.4

Price Street South

Alternative	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr
Alt 1 - Rock Revetment	10	5	152	20	10	200	30,417
Alt 2 - Vertical Concrete Wall	12	7	213	20	12	240	51,100
Alt 3 - Sculpted Concrete Shotcrete Wall	14	8	243	20	14	280	68,133

Criteria Emissions

Pounds per day					Tons per quarter				
ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
0.02	0.88	0.13	0.01	0.01	0.000	0.017	0.002	0.000	0.000
0.02	1.06	0.15	0.01	0.01	0.001	0.028	0.004	0.000	0.000
0.03	1.24	0.18	0.01	0.01	0.001	0.038	0.005	0.000	0.000

GHG

CO_2	NH_3	CO_2e
tpy	tpy	MT/Y
17.1	0.001	15.5
28.7	0.002	26.0
38.2	0.002	34.7

Price Street North

Alternative	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr
Alt 1 - Rock Revetment	10	5	152	20	10	200	30,417
Alt 2 - Vertical Concrete Wall	12	7	213	20	12	240	51,100
Alt 3 - Sculpted Concrete Shotcrete Wall	14	8	243	20	14	280	68,133

Criteria Emissions

Pounds per day					Tons per quarter				
ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
0.02	0.88	0.13	0.01	0.01	0.000	0.017	0.002	0.000	0.000
0.02	1.06	0.15	0.01	0.01	0.001	0.028	0.004	0.000	0.000
0.03	1.24	0.18	0.01	0.01	0.001	0.038	0.005	0.000	0.000

GHG

CO_2	NH_3	CO_2e
tpy	tpy	MT/Y
17.1	0.001	15.5
28.7	0.002	26.0
38.2	0.002	34.7

St Andrews Lift Station (Memory Park)

Alternative	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr
Alt 1 - Rock Revetment	10	3	91	20	10	200	18,250
Alt 2 - Vertical Concrete Wall	12	4	122	20	12	240	29,200
Alt 3 - Sculpted Concrete Shotcrete Wall	14	5	152	20	14	280	42,583

Criteria Emissions

Pounds per day					Tons per quarter				
ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000
0.02	1.06	0.15	0.01	0.01	0.000	0.016	0.002	0.000	0.000
0.03	1.24	0.18	0.01	0.01	0.001	0.024	0.003	0.000	0.000

GHG

CO_2	NH_3	CO_2e
tpy	tpy	MT/Y
10.2	0.001	9.3
16.4	0.001	14.9
23.9	0.001	21.7

Vista del Mar

Alternative	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr
Alt 1 - Rock Revetment	10	3	91	20	10	200	18,250
Alt 2 - Vertical Concrete Wall	12	4	122	20	12	240	29,200
Alt 3 - Sculpted Concrete Shotcrete Wall	14	5	152	20	14	280	42,583

Criteria Emissions

Pounds per day					Tons per quarter				
ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000
0.02	1.06	0.15	0.01	0.01	0.000	0.016	0.002	0.000	0.000
0.03	1.24	0.18	0.01	0.01	0.001	0.024	0.003	0.000	0.000

GHG

CO_2	NH_3	CO_2e
tpy	tpy	MT/Y
10.2	0.001	9.3
16.4	0.001	14.9
23.9	0.001	21.7

Ocean Park (Capistrano)

Alternative	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr	Criteria Emissions: Pounds per day ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	Criteria Emissions: Tons per quarter ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	GHG: CO_2 tpy	NH_3 tpy	CO_2e MT/Y
Alt 1 - Rock Revetment	10	3	91	20	10	200	18,250	0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000	10.2	0.001	9.3
Alt 2 - Vertical Concrete Wall	12	4	122	20	12	240	29,200	0.02	1.06	0.15	0.01	0.01	0.000	0.016	0.002	0.000	0.000	16.4	0.001	14.9
Alt 3 - Sculpted Concrete Shotcrete Wall	14	5	152	20	14	280	42,583	0.03	1.24	0.18	0.01	0.01	0.001	0.024	0.003	0.000	0.000	23.9	0.001	21.7

Summary by Alternative

Alt 1 - Rock Revetment

Site	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr	Pounds per day ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	Tons per quarter ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2 tpy	NH_3 tpy	CO_2e MT/Y
Cypress	10	3	91	20	10	200	18,250	0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000	10.2	0.001	9.3
Price Street South	10	5	152	20	10	200	30,417	0.02	0.88	0.13	0.01	0.01	0.000	0.017	0.002	0.000	0.000	17.1	0.001	15.5
Price Street North	10	5	152	20	10	200	30,417	0.02	0.88	0.13	0.01	0.01	0.000	0.017	0.002	0.000	0.000	17.1	0.001	15.5
St Andrews Lift Station (Memory Park)	10	3	91	20	10	200	18,250	0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000	10.2	0.001	9.3
Vista del Mar	10	3	91	20	10	200	18,250	0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000	10.2	0.001	9.3
Ocean Park (Capistrano)	10	3	91	20	10	200	18,250	0.02	0.88	0.13	0.01	0.01	0.000	0.010	0.001	0.000	0.000	10.2	0.001	9.3
						TOTALS	***133,833***	***0.12***	***5.30***	***0.76***	***0.06***	***0.05***	***0.002***	***0.074***	***0.011***	***0.001***	***0.001***	***75.0***	***0.004***	***68.2***

Alt 2 - Vertical Concrete Wall

Site	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr	Pounds per day ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	Tons per quarter ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	CO_2 tpy	NH_3 tpy	CO_2e MT/Y
Cypress	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Price Street South	12	7	213	20	12	240	51,100	0.02	1.06	0.15	0.01	0.01	0.001	0.028	0.004	0.000	0.000	28.7	0.002	26.0
Price Street North	12	7	213	20	12	240	51,100	0.02	1.06	0.15	0.01	0.01	0.001	0.028	0.004	0.000	0.000	28.7	0.002	26.0
St Andrews Lift Station (Memory Park)	12	4	122	20	12	240	29,200	0.02	1.06	0.15	0.01	0.01	0.000	0.016	0.002	0.000	0.000	16.4	0.001	14.9
Vista del Mar	12	4	122	20	12	240	29,200	0.02	1.06	0.15	0.01	0.01	0.000	0.016	0.002	0.000	0.000	16.4	0.001	14.9
Ocean Park (Capistrano)	12	4	122	20	12	240	29,200	0.02	1.06	0.15	0.01	0.01	0.000	0.016	0.002	0.000	0.000	16.4	0.001	14.9
						TOTALS	***189,800***	***0.12***	***5.30***	***0.76***	***0.06***	***0.05***	***0.002***	***0.105***	***0.015***	***0.001***	***0.001***	***106.4***	***0.006***	***96.6***

Alt 3 - Sculpted Concrete Shotcrete Wall

Site	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr	Pounds per day					Tons per quarter					CO_2	NH_3	CO_2e
								ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	tpy	tpy	MT/Y
Cypress	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Price Street South	14	8	243	20	14	280	68,133	0.03	1.24	0.18	0.01	0.01	0.001	0.038	0.005	0.000	0.000	38.2	0.002	34.7
Price Street North	14	8	243	20	14	280	68,133	0.03	1.24	0.18	0.01	0.01	0.001	0.038	0.005	0.000	0.000	38.2	0.002	34.7
St Andrews Lift Station (Memory Park)	14	5	152	20	14	280	42,583	0.03	1.24	0.18	0.01	0.01	0.001	0.024	0.003	0.000	0.000	23.9	0.001	21.7
Vista del Mar	14	5	152	20	14	280	42,583	0.03	1.24	0.18	0.01	0.01	0.001	0.024	0.003	0.000	0.000	23.9	0.001	21.7
Ocean Park (Capistrano)	14	5	152	20	14	280	42,583	0.03	1.24	0.18	0.01	0.01	0.001	0.024	0.003	0.000	0.000	23.9	0.001	21.7
						TOTALS	***264,017***	***0.14***	***6.18***	***0.89***	***0.07***	***0.06***	***0.003***	***0.146***	***0.021***	***0.002***	***0.001***	***148.0***	***0.008***	***134.4***

Alt 4 - Steel Sheetpile Wall

Site	# Emp	Duration (mon)	Work days	RT Mileage	RT* per Day	Total VMT/d	Total VMT/yr	Pounds per day					Tons per quarter					CO_2	NH_3	CO_2e
								ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	tpy	tpy	MT/Y
Cypress	10	4	122	20	10	200	24,333	0.02	0.88	0.13	0.01	0.01	0.000	0.013	0.002	0.000	0.000	13.6	0.001	12.4
Price Street South	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Price Street North	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
St Andrews Lift Station (Memory Park)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vista del Mar	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ocean Park (Capistrano)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
						TOTALS	***24,333***	***0.02***	***0.88***	***0.13***	***0.01***	***0.01***	***0.000***	***0.013***	***0.002***	***0.000***	***0.000***	***13.6***	***0.001***	***12.4***

Cypress - Construction On-road Truck Emissions

Alternative 1 - Rock Revetment	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	35	30	1,040	46	1,380	47,840	0.59	3.40	16.18	0.15	0.14	0.003	0.015	0.070	0.001	0.001	24.83	0.00043	24.93
Concrete Trucks	7	40	280	46	1,840	12,880	0.79	4.53	21.57	0.20	0.18	0.001	0.004	0.019	0.000	0.000	6.68	0.00012	6.71
TOTAL			***1,320***		***3,220***	***60,720***	***1.38***	***7.93***	***37.74***	***0.35***	***0.32***	***0.003***	***0.019***	***0.089***	***0.001***	***0.001***	***31.51***	***0.00055***	***31.64***

Alternative 4 - Steel Sheetpile Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	8	30	220	46	1,380	10,120	0.59	3.40	16.18	0.15	0.14	0.001	0.003	0.015	0.000	0.000	5.25	0.00009	5.27
Concrete Trucks	7	40	280	46	1,840	12,880	0.79	4.53	21.57	0.20	0.18	0.001	0.004	0.019	0.000	0.000	6.68	0.00012	6.71
Sheetpile Delivery Trucks	7	3	20	46	131	920	0.07	0.33	1.72	0.01	0.01	0.000	0.000	0.002	0.000	0.000	0.48	0.00001	0.48
TOTAL			***520***		***3,351***	***23,920***	***1.45***	***8.26***	***39.46***	***0.37***	***0.34***	***0.001***	***0.007***	***0.035***	***0.000***	***0.000***	***12.41***	***0.00022***	***12.46***

Price Street South - Construction On-road Truck Emissions

Alternative 1 - Rock Revetment	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	9	30	260	46	1,380	11,960	0.59	3.40	16.18	0.15	0.14	0.001	0.004	0.018	0.000	0.000	6.21	0.00011	6.23
TOTAL			***260***		***1,380***	***11,960***	***0.59***	***3.40***	***16.18***	***0.15***	***0.14***	***0.001***	***0.004***	***0.018***	***0.000***	***0.000***	***6.21***	***0.00011***	***6.23***

Alternative 2 - Vertical Concrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	60	46	1,380	2,760	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.004	0.000	0.000	1.43	0.00003	1.44
Concrete Trucks	4	40	130	46	1,840	5,980	0.79	4.53	21.57	0.20	0.18	0.000	0.002	0.009	0.000	0.000	3.10	0.00005	3.12
Soil Haul Trucks	3	30	70	46	1,380	3,220	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.005	0.000	0.000	1.67	0.00003	1.68
TOTAL			***260***		***4,600***	***11,960***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.001***	***0.004***	***0.018***	***0.000***	***0.000***	***6.21***	***0.00011***	***6.23***

Alternative 3 - Sculpted Concrete Shotcrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	60	46	1,380	2,760	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.004	0.000	0.000	1.43	0.00003	1.44
Concrete Trucks	4	40	150	46	1,840	6,900	0.79	4.53	21.57	0.20	0.18	0.000	0.002	0.010	0.000	0.000	3.58	0.00006	3.60
Soil Haul Trucks	3	30	70	46	1,380	3,220	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.005	0.000	0.000	1.67	0.00003	1.68
TOTAL			***280***		***4,600***	***12,880***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.001***	***0.004***	***0.019***	***0.000***	***0.000***	***6.68***	***0.00012***	***6.71***

Price Street North - Construction On-road Truck Emissions

Alternative 1 - Rock Revetment	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	14	30	420	46	1,380	19,320	0.59	3.40	16.18	0.15	0.14	0.001	0.006	0.028	0.000	0.000	10.03	0.00018	10.07
TOTAL			***420***		***1,380***	***19,320***	***0.59***	***3.40***	***16.18***	***0.15***	***0.14***	***0.001***	***0.006***	***0.028***	***0.000***	***0.000***	***10.03***	***0.00018***	***10.07***

Alternative 2 - Vertical Concrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	3	30	90	46	1,380	4,140	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.006	0.000	0.000	2.15	0.00004	2.16
Concrete Trucks	6	40	220	46	1,840	10,120	0.79	4.53	21.57	0.20	0.18	0.001	0.003	0.015	0.000	0.000	5.25	0.00009	5.27
Soil Haul Trucks	3	30	70	46	1,380	3,220	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.005	0.000	0.000	1.67	0.00003	1.68
TOTAL			***380***		***4,600***	***17,480***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.001***	***0.005***	***0.026***	***0.000***	***0.000***	***9.07***	***0.00016***	***9.11***

Alternative 3 - Sculpted Concrete Shotcrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	3	30	90	46	1,380	4,140	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.006	0.000	0.000	2.15	0.00004	2.16
Concrete Trucks	6	40	230	46	1,840	10,580	0.79	4.53	21.57	0.20	0.18	0.001	0.003	0.016	0.000	0.000	5.49	0.00010	5.51
Soil Haul Trucks	3	30	70	46	1,380	3,220	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.005	0.000	0.000	1.67	0.00003	1.68
TOTAL			***390***		***4,600***	***17,940***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.001***	***0.006***	***0.026***	***0.000***	***0.000***	***9.31***	***0.00016***	***9.35***

St Andrews Lift Station - Construction On-road Truck Emissions

Alternative 1 - Rock Revetment	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	6	30	180	46	1,380	8,280	0.59	3.40	16.18	0.15	0.14	0.000	0.003	0.012	0.000	0.000	4.30	0.00008	4.31
TOTAL			***180***		***1,380***	***8,280***	***0.59***	***3.40***	***16.18***	***0.15***	***0.14***	***0.000***	***0.003***	***0.012***	***0.000***	***0.000***	***4.30***	***0.00008***	***4.31***

Alternative 2 - Vertical Concrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	40	46	1,380	1,840	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.003	0.000	0.000	0.95	0.00002	0.96
Concrete Trucks	2	40	80	46	1,840	3,680	0.79	4.53	21.57	0.20	0.18	0.000	0.001	0.005	0.000	0.000	1.91	0.00003	1.92
Soil Haul Trucks	1	30	30	46	1,380	1,380	0.59	3.40	16.18	0.15	0.14	0.000	0.000	0.002	0.000	0.000	0.72	0.00001	0.72
TOTAL			***150***		***4,600***	***6,900***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.000***	***0.002***	***0.010***	***0.000***	***0.000***	***3.58***	***0.00006***	***3.60***

Alternative 3 - Sculpted Concrete Shotcrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	40	46	1,380	1,840	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.003	0.000	0.000	0.95	0.00002	0.96
Concrete Trucks	3	40	90	46	1,840	4,140	0.79	4.53	21.57	0.20	0.18	0.000	0.001	0.006	0.000	0.000	2.15	0.00004	2.16
Soil Haul Trucks	1	30	30	46	1,380	1,380	0.59	3.40	16.18	0.15	0.14	0.000	0.000	0.002	0.000	0.000	0.72	0.00001	0.72
TOTAL			***160***		***4,600***	***7,360***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.000***	***0.002***	***0.011***	***0.000***	***0.000***	***3.82***	***0.00007***	***3.84***

Vista del Mar - Construction On-road Truck Emissions

Alternative 1 - Rock Revetment	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	7	30	200	46	1,380	9,200	0.59	3.40	16.18	0.15	0.14	0.000	0.003	0.013	0.000	0.000	4.77	0.00008	4.79
TOTAL			***200***		***1,380***	***9,200***	***0.59***	***3.40***	***16.18***	***0.15***	***0.14***	***0.000***	***0.003***	***0.013***	***0.000***	***0.000***	***4.77***	***0.00008***	***4.79***

Alternative 2 - Vertical Concrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	50	46	1,380	2,300	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.003	0.000	0.000	1.19	0.00002	1.20
Concrete Trucks	2	40	50	46	1,840	2,300	0.79	4.53	21.57	0.20	0.18	0.000	0.001	0.003	0.000	0.000	1.19	0.00002	1.20
Soil Haul Trucks	1	30	30	46	1,380	1,380	0.59	3.40	16.18	0.15	0.14	0.000	0.000	0.002	0.000	0.000	0.72	0.00001	0.72
TOTAL			***130***		***4,600***	***5,980***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.000***	***0.002***	***0.009***	***0.000***	***0.000***	***3.10***	***0.00005***	***3.12***

Alternative 3 - Sculpted Concrete Shotcrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	50	46	1,380	2,300	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.003	0.000	0.000	1.19	0.00002	1.20
Concrete Trucks	2	40	60	46	1,840	2,760	0.79	4.53	21.57	0.20	0.18	0.000	0.001	0.004	0.000	0.000	1.43	0.00003	1.44
Soil Haul Trucks	1	30	30	46	1,380	1,380	0.59	3.40	16.18	0.15	0.14	0.000	0.000	0.002	0.000	0.000	0.72	0.00001	0.72
TOTAL			***140***		***4,600***	***6,440***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.000***	***0.002***	***0.009***	***0.000***	***0.000***	***3.34***	***0.00006***	***3.36***

Ocean Park - Construction On-road Truck Emissions

Alternative 1 - Rock Revetment	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	9	30	250	46	1,380	11,500	0.59	3.40	16.18	0.15	0.14	0.001	0.004	0.017	0.000	0.000	5.97	0.00010	5.99
TOTAL			***250***		***1,380***	***11,500***	***0.59***	***3.40***	***16.18***	***0.15***	***0.14***	***0.001***	***0.004***	***0.017***	***0.000***	***0.000***	***5.97***	***0.00010***	***5.99***

Alternative 2 - Vertical Concrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	60	46	1,380	2,760	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.004	0.000	0.000	1.43	0.00003	1.44
Concrete Trucks	2	40	70	46	1,840	3,220	0.79	4.53	21.57	0.20	0.18	0.000	0.001	0.005	0.000	0.000	1.67	0.00003	1.68
Soil Haul Trucks	2	30	40	46	1,380	1,840	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.003	0.000	0.000	0.95	0.00002	0.96
TOTAL			***170***		***4,600***	***7,820***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.000***	***0.002***	***0.011***	***0.000***	***0.000***	***4.06***	***0.00007***	***4.07***

Alternative 3 - Sculpted Concrete Shotcrete Wall	Trucking Days	Trucks per Day	Total Trips	RT Mileage	VMT/d	Total VMT	Pounds per day					Tons per quarter					Total metric tonnes		
							ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	NH_3	CO_2e
Rock Haul Trucks	2	30	60	46	1,380	2,760	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.004	0.000	0.000	1.43	0.00003	1.44
Concrete Trucks	2	40	80	46	1,840	3,680	0.79	4.53	21.57	0.20	0.18	0.000	0.001	0.005	0.000	0.000	1.91	0.00003	1.92
Soil Haul Trucks	2	30	40	46	1,380	1,840	0.59	3.40	16.18	0.15	0.14	0.000	0.001	0.003	0.000	0.000	0.95	0.00002	0.96
TOTAL			***180***		***4,600***	***8,280***	***1.97***	***11.33***	***53.92***	***0.50***	***0.46***	***0.000***	***0.003***	***0.012***	***0.000***	***0.000***	***4.30***	***0.00008***	***4.31***

Air Quality/Climate Change Calculations

Title : Pismo Beach 2010
Version : Emfac2007 V2.3 Nov 1 2006
Scen Year: 2010 -- All model years in the range 1997 to 2009 selected
Season : Annual
Area : San Luis Obispo
****
Year: 2010 -- Model Years 1997 to 2009 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average for San Luis Obispo

Reactive Organic Gases										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	0.132	0.175	0.195	0.327	0.049	0.437	0.057	0.509	0.481	8.566
10	0.080	0.108	0.120	0.202	0.031	0.343	0.035	0.400	0.378	4.694
15	0.050	0.069	0.078	0.131	0.021	0.275	0.024	0.321	0.303	2.204
20	0.035	0.048	0.053	0.091	0.015	0.226	0.017	0.263	0.249	1.180
25	0.026	0.036	0.039	0.066	0.011	0.190	0.013	0.221	0.209	0.949
30	0.020	0.029	0.031	0.051	0.009	0.162	0.010	0.189	0.179	0.765
35	0.017	0.024	0.026	0.042	0.007	0.142	0.008	0.166	0.157	0.629
40	0.015	0.021	0.023	0.037	0.006	0.128	0.007	0.148	0.140	0.540
45	0.014	0.020	0.022	0.034	0.005	0.117	0.006	0.136	0.129	0.499
50	0.014	0.019	0.021	0.034	0.005	0.109	0.005	0.127	0.120	0.505
55	0.015	0.020	0.022	0.035	0.004	0.105	0.005	0.122	0.115	0.559
60	0.016	0.022	0.024	0.038	0.004	0.102	0.005	0.119	0.113	0.660
32.5	***0.036***	***0.049***	***0.055***	***0.091***	***0.014***	***0.195***	***0.016***	***0.227***	***0.214***	***1.813***

Carbon Monoxide										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	2.539	3.205	3.494	4.102	0.716	3.142	0.848	3.202	6.052	13.731
10	2.313	2.903	3.168	3.717	0.476	2.166	0.564	2.208	4.173	9.587
15	2.113	2.640	2.884	3.383	0.335	1.563	0.397	1.593	3.011	6.562
20	1.937	2.411	2.635	3.090	0.249	1.181	0.295	1.203	2.274	4.777
25	1.780	2.210	2.417	2.833	0.195	0.933	0.231	0.951	1.798	4.076
30	1.640	2.034	2.225	2.608	0.162	0.772	0.192	0.787	1.487	3.494
35	1.516	1.878	2.055	2.408	0.142	0.668	0.168	0.681	1.287	3.031
40	1.405	1.741	1.905	2.232	0.131	0.605	0.155	0.617	1.166	2.686
45	1.306	1.620	1.772	2.077	0.128	0.574	0.152	0.585	1.106	2.459
50	1.217	1.513	1.654	1.939	0.132	0.570	0.157	0.580	1.097	2.351
55	1.138	1.418	1.550	1.817	0.145	0.591	0.171	0.603	1.139	2.362
60	1.067	1.334	1.457	1.709	0.167	0.643	0.197	0.655	1.238	2.491
32.5	***1.664***	***2.076***	***2.268***	***2.660***	***0.248***	***1.117***	***0.294***	***1.139***	***2.152***	***4.801***

Air Quality/Climate Change Calculations

Oxides of Nitrogen										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	0.304	0.400	0.618	0.841	0.180	7.602	0.228	8.485	12.566	39.313
10	0.265	0.346	0.536	0.725	0.189	6.307	0.239	7.039	10.425	27.211
15	0.236	0.305	0.474	0.638	0.198	5.422	0.251	6.051	8.962	19.667
20	0.213	0.274	0.426	0.573	0.207	4.829	0.263	5.390	7.982	16.660
25	0.196	0.251	0.390	0.524	0.216	4.457	0.274	4.974	7.367	15.819
30	0.183	0.234	0.364	0.488	0.225	4.262	0.286	4.757	7.044	15.141
35	0.173	0.222	0.345	0.463	0.234	4.222	0.297	4.713	6.979	14.628
40	0.167	0.214	0.334	0.448	0.244	4.335	0.309	4.838	7.165	14.278
45	0.164	0.211	0.328	0.441	0.253	4.611	0.320	5.146	7.621	14.091
50	0.163	0.212	0.329	0.444	0.262	5.082	0.332	5.672	8.400	14.069
55	0.166	0.217	0.335	0.454	0.271	5.803	0.343	6.477	9.592	14.210
60	0.171	0.226	0.348	0.475	0.280	6.867	0.355	7.664	11.350	14.515
32.5	***0.200***	***0.259***	***0.402***	***0.543***	***0.230***	***5.317***	***0.291***	***5.934***	***8.788***	***18.300***

PM_{10}										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	0.049	0.056	0.108	0.110	0.026	0.111	0.032	0.111	0.593	1.679
10	0.032	0.036	0.070	0.072	0.017	0.087	0.021	0.087	0.466	1.131
15	0.022	0.025	0.048	0.049	0.012	0.070	0.014	0.070	0.374	0.731
20	0.016	0.018	0.035	0.035	0.008	0.057	0.010	0.057	0.307	0.503
25	0.012	0.014	0.026	0.027	0.006	0.048	0.007	0.048	0.257	0.421
30	0.009	0.011	0.021	0.022	0.005	0.041	0.006	0.041	0.220	0.364
35	0.008	0.009	0.018	0.018	0.004	0.036	0.005	0.036	0.193	0.331
40	0.007	0.008	0.016	0.016	0.003	0.032	0.004	0.032	0.173	0.322
45	0.007	0.008	0.015	0.015	0.003	0.030	0.003	0.030	0.158	0.339
50	0.007	0.008	0.015	0.015	0.003	0.028	0.003	0.028	0.148	0.380
55	0.007	0.008	0.015	0.016	0.002	0.027	0.003	0.027	0.142	0.445
60	0.008	0.009	0.017	0.017	0.002	0.026	0.003	0.026	0.139	0.535
32.5	***0.015***	***0.018***	***0.034***	***0.034***	***0.008***	***0.049***	***0.009***	***0.049***	***0.264***	***0.598***

$PM_{2.5}$										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	0.046	0.052	0.1	0.102	0.025	0.102	0.029	0.102	0.546	1.545
10	0.029	0.033	0.065	0.066	0.016	0.08	0.019	0.08	0.428	1.041
15	0.02	0.023	0.044	0.045	0.011	0.064	0.013	0.064	0.344	0.673
20	0.014	0.017	0.032	0.033	0.008	0.053	0.009	0.053	0.282	0.463
25	0.011	0.013	0.024	0.025	0.006	0.044	0.007	0.044	0.237	0.388
30	0.009	0.01	0.02	0.02	0.004	0.038	0.005	0.038	0.203	0.335
35	0.007	0.009	0.017	0.017	0.004	0.033	0.004	0.033	0.178	0.304
40	0.007	0.008	0.015	0.015	0.003	0.03	0.004	0.03	0.159	0.297
45	0.006	0.007	0.014	0.014	0.003	0.027	0.003	0.027	0.146	0.311
50	0.006	0.007	0.014	0.014	0.002	0.026	0.003	0.026	0.136	0.349
55	0.006	0.007	0.014	0.015	0.002	0.024	0.003	0.024	0.131	0.409
60	0.007	0.008	0.016	0.016	0.002	0.024	0.003	0.024	0.128	0.492
32.5	***0.014***	***0.016***	***0.031***	***0.032***	***0.007***	***0.045***	***0.009***	***0.045***	***0.243***	***0.551***

Air Quality/Climate Change Calculations

Carbon Dioxide										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	940.9	1,188.6	1,190.8	1,622.9	2,513.5	519.0	2,513.5	519.0	1,505.0	3,845.4
10	711.0	898.2	899.9	1,226.3	1,672.3	519.0	1,672.3	519.0	1,505.0	3,165.4
15	557.6	704.4	705.8	961.8	1,175.5	519.0	1,175.5	519.0	1,505.0	2,596.0
20	453.9	573.4	574.5	782.9	873.0	519.0	873.0	519.0	1,505.0	2,183.2
25	383.5	484.5	485.4	661.5	685.0	519.0	685.0	519.0	1,505.0	2,042.7
30	336.3	424.8	425.6	580.0	567.9	519.0	567.9	519.0	1,505.0	1,924.2
35	306.1	386.6	387.4	527.9	497.4	519.0	497.4	519.0	1,505.0	1,827.8
40	289.1	365.2	365.9	498.7	460.3	519.0	460.3	519.0	1,505.0	1,753.4
45	283.5	358.1	358.8	488.9	450.1	519.0	450.1	519.0	1,505.0	1,701.0
50	288.4	364.4	365.1	497.5	465.0	519.0	465.0	519.0	1,505.0	1,670.7
55	304.6	384.8	385.6	525.4	507.5	519.0	507.5	519.0	1,505.0	1,662.4
60	333.9	421.9	422.6	576.0	585.2	519.0	585.2	519.0	1,505.0	1,676.0
32.5	***432.4***	***546.2***	***547.3***	***745.8***	***871.1***	***519.0***	***871.1***	***519.0***	***1,505.0***	***2,170.7***

Methane										
Speed	LDA	LDT1	LDT2	MDV	LHD1	LHD1	LHD2	LHD2	MHD	HHD
MPH	Gas	Gas	Gas	Gas	Gas	Diesel	Gas	Diesel	Diesel	Diesel
5	0.058	0.067	0.071	0.087	0.04	0.02	0.043	0.024	0.022	0.398
10	0.044	0.052	0.055	0.071	0.027	0.016	0.03	0.019	0.018	0.218
15	0.035	0.042	0.043	0.058	0.018	0.013	0.021	0.015	0.014	0.102
20	0.027	0.033	0.035	0.047	0.013	0.01	0.015	0.012	0.012	0.055
25	0.021	0.026	0.028	0.039	0.01	0.009	0.011	0.01	0.01	0.044
30	0.017	0.022	0.023	0.034	0.008	0.008	0.009	0.009	0.008	0.036
35	0.015	0.019	0.02	0.03	0.006	0.007	0.007	0.008	0.007	0.029
40	0.013	0.017	0.018	0.028	0.005	0.006	0.006	0.007	0.007	0.025
45	0.012	0.016	0.017	0.026	0.004	0.005	0.005	0.006	0.006	0.023
50	0.012	0.016	0.017	0.026	0.004	0.005	0.005	0.006	0.006	0.023
55	0.013	0.016	0.018	0.027	0.004	0.005	0.004	0.006	0.005	0.026
60	0.014	0.018	0.019	0.029	0.004	0.005	0.004	0.006	0.005	0.031
32.5	***0.023***	***0.029***	***0.030***	***0.042***	***0.012***	***0.009***	***0.013***	***0.011***	***0.010***	***0.084***

Emfac2007 Emission Factors: V2.3 Nov 1 2006

EMFAC 2007 Vehicle Classes			Assumptions
Abbr	Description	Weight Class (lbs)	
LDA	Passenger Cars	all	Employee vehicles
LDT1	Light duty Trucks	0 - 3,750	
LDT2	Light duty Trucks	3,751 - 5,750	
MDV	Medium duty trucks	5,751 - 8,500	
LHD1	Light heavy duty	8,501 - 10,000	Rock and soil haul plus concrete trucks
LHD2	Light heavy duty	10,001 - 14,000	Sheetpile delivery trucks
MHD	Meduim heavy duty	14,001 - 33,000	
HHD	Heavy heavy duty	33,001 - 60,000	

PROJECT ASSUMPTIONS

Activity	Class	Fuel	Emission Factor (g/mi)						
			ROG	CO	NO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Employee Commute	LDA/LDT	G	0.047	2.003	0.287	0.022	0.020	508.6	0.027
Rock Haul Truck Trips	LHD1	D	0.195	1.117	5.317	0.049	0.045	519.0	0.009
Concrete Truck Trips	LHD1	D	0.195	1.117	5.317	0.049	0.045	519.0	0.009
Sheetpile Delivery Truck Trips	LHD2	D	0.227	1.139	5.934	0.049	0.045	519.0	0.011
Soil Haul Truck Trips	LHD1	D	0.195	1.117	5.317	0.049	0.045	519.0	0.009

Fugitive Dust Calculations

Cypress

Alternative	Acres	Months	Acres per month	Fugitive Dust (PM_{10})		
				tons/mo	tpq	lbs/d
#1 - Rock Revetment	0.87	3	0.290	0.0319	0.096	2.10
#4 - Steel Sheetpile Wall	0.15	4	0.038	0.0041	0.012	0.27

Price Street - South

Alternative	Acres	Months	Acres per month	Fugitive Dust (PM_{10})		
				tons/mo	tpq	lbs/d
#1 - Rock Revetment	0.16	5	0.032	0.0035	0.011	0.23
#2 - Vertical Concrete Wall	0.16	7	0.023	0.0025	0.008	0.17
#3 - Sculpted Concrete/Shotcrete Wall	0.16	8	0.020	0.0022	0.007	0.14

Price Street - North

Alternative	Acres	Months	Acres per month	Fugitive Dust (PM_{10})		
				tons/mo	tpq	lbs/d
#1 - Rock Revetment	0.39	5	0.078	0.0086	0.026	0.56
#2 - Vertical Concrete Wall	0.22	7	0.031	0.0035	0.010	0.23
#3 - Sculpted Concrete/Shotcrete Wall	0.22	8	0.028	0.0030	0.009	0.20

St. Andrews Lift Station (Memory Park)

Alternative	Acres	Months	Acres per month	Fugitive Dust (PM_{10})		
				tons/mo	tpq	lbs/d
#1 - Rock Revetment	0.18	3	0.060	0.0066	0.020	0.43
#2 - Vertical Concrete Wall	0.06	4	0.015	0.0017	0.005	0.11
#3 - Sculpted Concrete/Shotcrete Wall	0.06	5	0.012	0.0013	0.004	0.09

Vista del Mar

Alternative	Acres	Months	Acres per month	Fugitive Dust (PM_{10})		
				tons/mo	tpq	lbs/d
#1 - Rock Revetment	0.17	3	0.057	0.0062	0.019	0.41
#2 - Vertical Concrete Wall	0.06	4	0.015	0.0017	0.005	0.11
#3 - Sculpted Concrete/Shotcrete Wall	0.06	5	0.012	0.0013	0.004	0.09

Air Quality/Climate Change Calculations

Ocean Park (Capistrano)

Alternative	Acres	Months	Acres per month	Fugitive Dust (PM_{10})		
				tons/mo	tpq	lbs/d
#1 - Rock Revetment	0.20	3	0.067	0.0073	0.022	0.48
#2 - Vertical Concrete Wall	0.08	4	0.020	0.0022	0.007	0.14
#3 - Sculpted Concrete/Shotcrete Wall	0.08	5	0.016	0.0018	0.005	0.12

Low Level Fugitive Dust Emission Estimate Approach from URBEMIS

Factors

0.11 tons per acre-month **days / month =** 30.4

APPENDIX D – COORDINATION SUMMARY

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

August 4, 2009

REPLY TO
ATTENTION OF

Office of the Chief
Environmental Resources Branch

Mr. Rodney R. McInnis
Acting Regional Administrator
National Marine Fisheries Service
501 West Ocean Blvd. Suite 4200
Long Beach, California 90802-4221

Dear Mr. McInnis:

The U.S. Army Corps of Engineers is conducting a shoreline protection study along a stretch of the shoreline in Pismo Beach. The study area is located in the city of Pismo Beach, San Luis Obispo County, California (please see attached project vicinity map).

Please provide us a current list of any endangered, threatened, proposed or candidate species, pursuant to the Endangered Species Act of 1973, that may be affected by the proposed project. Please include species of concern. This letter also requests your review and written comments for this project. Comments, and the species list, should be forwarded by September 1, 2009, to:

Mr. Larry Smith
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

Should you require additional information or have any questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846.

Sincerely,

Josephine R. Axt, PhD
Chief, Planning Division

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

August 4, 2009

REPLY TO
ATTENTION OF

Office of the Chief
Environmental Resources Branch

Diane Noda
Field Supervisor
U.S. Fish & Wildlife Service
2493 Portola Road, Suite B
Ventura, CA 93003

Dear Ms. Noda:

The U.S. Army Corps of Engineers is conducting a shoreline protection study along a stretch of the shoreline in Pismo Beach. The study area is located in the city of Pismo Beach, San Luis Obispo County, California (please see attached project vicinity map).

Please provide us a current list of any endangered, threatened, proposed or candidate species, pursuant to the Endangered Species Act of 1973, that may be affected by the proposed project. Please include species of concern. This letter also requests your review and written comments for this project. Comments, and the species list, should be forwarded by September 1, 2009, to:

Mr. Larry Smith
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

Should you require additional information or have any questions, please contact Mr. Larry Smith, Project Environmental Coordinator, at (213) 452-3846.

Sincerely,

Josephine R. Axt, PhD
Chief, Planning Division

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
2009-FA-0118

September 17, 2009

Josephine Axt, Planning Division Chief
U.S. Army Corps of Engineers
Attention: Mr. Larry Smith
P.O. Box 532711
Los Angeles, California 90053-2325

Subject: Species List for Shoreline Protection Study, City of Pismo Beach, San Luis Obispo County, California

Dear Ms. Axt:

We are responding to your request, dated August 4, 2009, and received in our office on August 7, 2009, for a list of endangered, threatened, proposed, and candidate species which may be present in the vicinity of the subject project. In addition, you requested our review and written comments. The U.S. Army Corps of Engineers (Corps) is conducting a shoreline protection study along a stretch of the shoreline in the city of Pismo Beach, San Luis Obispo County, California. Because no project description for us to comment on was provided with your request, we will only be including a species list with our response at this time. Your request and our response are made pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act).

The enclosed list of species fulfills the requirements of the U.S. Fish and Wildlife Service under section 7(c) of the Act. The Corps, as the lead Federal Agency for the subject project, has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a construction project that may require an environmental impact statement[1], the Corps has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the Corps determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to written request for formal consultation. During this review process, the Corps may engage in planning efforts but may not make an irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

[1] "Construction project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building of structures such as dams, buildings, roads, pipelines, and channels. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorizations or approval which may result in construction.

Only listed species receive protection under the Act; however, sensitive species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. We recommend that you review information in the California Department of Fish and Game's Natural Diversity Data Base. You can contact the California Department of Fish and Game at (916) 324-3812 for information on other sensitive species that may occur in this area.

Should you have any questions regarding this matter, please contact Andrea Adams of our staff at (805) 644-1766, extension 318.

Sincerely,

Chris Dellith
Senior Biologist

Enclosure

LISTED SPECIES WHICH MAY OCCUR IN THE VICINITY OF THE PISMO BEACH SHORELINE PROTECTION STUDY, PISMO BEACH, SAN LUIS OBISPO COUNTY, CALIFORNIA

Mammals		
Southern sea otter	*Enhydra lutris nereis*	T
Birds		
Brown pelican	*Pelecanus occidentalis*	E
California least tern	*Sterna antillarum browni*	E
Marbled murrelet	*Brachyramphus marmoratus marmoratus*	T **
Western snowy plover	*Charadrius alexandrinus nivosus*	T
Amphibians		
California red-legged frog	*Rana aurora draytonii*	T
Fish		
Tidewater goby	*Eucyclogobius newberryi*	E
Steelhead trout*	*Oncorhynchus mykiss*	*
Plants		
Morro manzanita	*Arctostaphylos morroensis*	T
La Graciosa thistle	*Cirsium loncholepis*	E
Marsh sandwort	*Arenaria paludicola*	E
Pismo clarkia	*Clarkia speciosa* ssp. *immaculata*	E
Chorro Creek bog thistle	*Cirsium fontinale* var. *obispoense*	E
Gambel's watercress	*Rorippa* [*Nasturtium*] *gambellii*	E
Indian Knob mountainbalm	*Eriodictyon altissimum*	E

Key:

E	Endangered
T	Threatened

* The National Marine Fisheries Service is the responsible agency for the steelhead.

** Nonbreeding visitor to nearshore coastal waters

APPENDIX E – INITIAL STUDY CHECKLIST

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ENVIRONMENTAL CHECKLIST FORM

1. Project Title:
Pismo Beach Shoreline Protection Project

2. Lead Agency Name and Address:
City of Pismo Beach
760 Mattie Road
Pismo Beach, CA 93449-2056

3. Contact Person and Telephone Number:
Randy Bloom
(805) 773-4658

4. Project Location:
On the bluffs in Pismo Beach between Memory Park and Cypress Street.

5. Project Sponsor's Name and Address:
U.S. Army Corps of Engineers, Los Angeles District
915 Wilshire Blvd.
Los Angeles, CA 90017

6. General Plan Designation:
Resort Commercial, Low Density Residential, Medium Density Residential, and Open Space

7. Zoning:
OS – Open Space

8. Description of Project:
The proposed project would provide protection for the toe of the bluffs at six critically eroding sites. These sites are St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, Price Street - North, Price Street - South, and Cypress Street Lift Station. Four alternative bluff protection methods are being considered. These alternatives are rock revetment, vertical sea wall, sculpted concrete/shotcrete wall, and, at the Cypress Street Lift Station site only, a steel sheet pile wall.

9. Surrounding Land Uses and Setting:
The bluff tops at each of the sites is open space with a bluff top trail. The bluff top provides views of the ocean and the trail is used for walking, jogging, bicycling, and nature study. Beyond the bluffs, most of the area is low and medium density residential. Two hotels occur near the Price Street - North and Price Street - South sites. The Cypress Street Lift Station site is in the Central Commercial District. The bluffs at this site are near a highly used wide sandy beach.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):
California Coastal Commission Consistency Determination
Regional Water Quality Control Board – Section 401 Water Quality Certification

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- ☐ Aesthetics
- ☐ Agriculture Resources
- ☑ Air Quality
- ☑ Biological Resources
- ☐ Cultural Resources
- ☐ Geology and Soils
- ☐ Hazards/Hazardous Materials
- ☑ Hydrology/Water Quality
- ☐ Land Use and Planning
- ☐ Mineral Resources
- ☑ Noise
- ☐ Population and Housing
- ☐ Public Services
- ☑ Recreation
- ☑ Transportation and Traffic
- ☐ Utilities and Service Systems
- ☑ Mandatory Findings of Significance

Determination

On the basis of this evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☑ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Printed Name	Agency

I. AESTHETICS

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the project have a substantial adverse effect on a scenic vista?	☐	☐	☑	☐
b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☑
c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑	☐
d) Would the project create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☑	☐

II. AGRICULTURE RESOURCES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☑

III. AIR QUALITY

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the project conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☑
b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☑
c) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state AAQS (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d) Would the project expose sensitive receptors to substantial pollutant concentrations?	☐	☑	☐	☐
e) Would the project create objectionable odors affecting a substantial number of people?	☐	☐	☑	☐

IV. BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and game or U.S. Fish and Wildlife Service?	☐	☑	☐	☐

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

c) Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

V. CULTURAL RESOURCES

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact

	☐	☐	☐	☑

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d) Would the project disturb any human remains, including those interred outside of formal cemeteries?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

VI. GEOLOGY AND SOILS

a) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

ii) Strong seismic ground shaking?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

iii) Seismic-related ground failure, including liquefaction?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

iv) Landslides?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Would the project result in substantial soil erosion or the loss of topsoil?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

VII. HAZARDS AND HAZARDOUS MATERIALS

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

g) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

h) Would the project expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

VIII HYDROLOGY AND WATER QUALITY

a) Would the project violate any water quality standards or waste discharge requirements?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact

	☐	☐	☐	☑

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or offsite?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or offsite?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

f) Would the project otherwise substantially degrade water quality?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☑	Less than Significant Impact ☐	No Impact ☐

g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

h) Would the project place, within a 100-year flood hazard, area structures that would impede or redirect flood flows?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

i) Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

j) Would the project expose people to inundation by seiche, tsunami, or mudflow?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

IX. LAND USE AND PLANNING

a) Would the project physically divide an established community?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

X. MINERAL RESOURCES

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

XI. NOISE

a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☑	Less than Significant Impact ☐	No Impact ☐

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☑	Less than Significant Impact ☐	No Impact ☐

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

XII. POPULATION AND HOUSING

a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

XIII. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire Protection? Police Protection? Schools? Parks? Other public facilities?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

XIV. RECREATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b) Does the project include recreational facilities or require the construction or expansion or recreational facilities which might have an adverse physical effect on the environment?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c)	Does the project include potential safety impacts to recreational users?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☑	Less than Significant Impact ☐	No Impact ☐

XV. TRANSPORTATION/TRAFFIC

a)	Would the project cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

b)	Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

c)	Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	Potentially Significant Impact ☐	Less than Significant With Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d)	Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☑	Less than Significant Impact ☐	No Impact ☐

e)	Would the project result in inadequate emergency access?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

f)	Would the project result in inadequate parking capacity?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

g)	Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

XVI. UTILITIES AND SERVICE SYSTEMS

a)	Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

b)	Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

c)	Would the project require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

d)	Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

e)	Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

f)	Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

g)	Would the project comply with federal, state, and local statutes and regulations related to solid waste?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☐	No Impact ☑

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

b)	Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☐	Less than Significant Impact ☑	No Impact ☐

c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	Potentially Significant Impact ☐	Less than Significant with Mitigation Incorporation ☑	Less than Significant Impact ☐	No Impact ☐

APPENDIX F – MITIGATION MONITORING AND REPORTING PROGRAM

CHAMBERS GROUP

MITIGATION MONITORING and REPORTING PROGRAM

In the following MMRP, each mitigation measure included in this Environmental Assessment/Mitigated Negative Declaration for the Pismo Beach Shoreline Protection Project is listed according to resource area. The project has incorporated these environmental protection measures as part of the project and shall be carried forward and implemented in accordance with project activities.

The time frame for implementation of each mitigation measure is listed. The agency or agencies responsible for monitoring the satisfactory implementation of mitigation measures also is identified. The timing and method of verification also is included.

#	Mitigation Measure	Implementing Action	Method of Verification	Timing of Verification	Responsible Party
WATER QUALITY					
1	Preparation and adherence to a Spill Prevention, Containment and Countermeasures Plan	Review of Plan	Onsite monitor to assure compliance with mitigation measure.	Prior to and during construction activities.	U.S. Army Corps of Engineers
2	Preparation and adherence to a Storm Water Pollution Prevention Plan	Review of Plan	Onsite monitor to assure compliance with mitigation measure.	Prior to and during construction activities.	U.S. Army Corps of Engineers
BIOLOGICAL RESOURCES					
1	Before the start of any construction activities on the beach, it shall be determined if harbor seals are hauled out on the beach. If harbor seals are hauled out on the beach, no construction activities should occur until the seals leave the beach.	Observation of beach	Onsite monitor to assure compliance with mitigation measure	Each day prior to the start of construction activities on the beach	U.S. Army Corps of Engineers
2	A biological monitor shall be present during any construction activities on the site, during the first week. If snowy plovers are observed near the construction area, the monitor will advise the work crews on how to avoid or minimize impacts to plover, which may include temporarily halting activities, until the plovers have left the site. Minimization measures shall continue throughout the site construction.	Survey of beach for snowy plovers	Onsite monitor to assure compliance with mitigation measure	Each day of the first week of construction prior to the start of construction activities on the beach	U.S. Army Corps of Engineers

#	Mitigation Measure	Implementing Action	Method of Verification	Timing of Verification	Responsible Party
3	Revetment alternative for the Cypress Street Lift Station only: After construction of the revetment, the buried portion of the revetment and the additional area disturbed by construction equipment as well as adjacent areas if necessary shall be revegetated with native dune vegetation.	Preparation of a revegetation plan	Review of revegetation plan and inspection of the revegetated area	After burial of the revetment	U.S. Army Corps of Engineers
4	At the Price Street South site, prior to construction of the revetment or sea wall, a survey for La Graciosa thistle should be done of central coastal scrub habitat within the footprint of the structure. If the plant is observed, seeds should be planted in central coastal scrub habitat that will not be disturbed by the construction.	Survey of scrub habitat at Price Street South site	Review of plant survey report	Prior to construction at Price Street South	U.S. Army Corps of Engineers
CULTURAL RESOURCES					
1	If cultural resources are discovered prior to or during work and cannot be avoided, work will be suspended in that area until resources are evaluated for eligibility for listing in the NRHP after consultation with the SHPO. If resources are deemed eligible for the NRHP, the effects of the project will be taken into consideration in consultation with the SHPO. The Advisory Council on Historic Preservation (ACHP) will be provided an opportunity to comment in accordance with 36 CFR 800.13.	Discovery of cultural resources	On-site monitor to assure compliance with mitigation measure	During construction	U.S. Army Corps of Engineers
NOISE					
1	The contractor shall implement measures to reduce construction noise at the St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, and Cypress Street Lift Station sites. The contractor shall implement measures to reduce construction noise at the St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, and Cypress Street Lift Station sites. Noise reduction measures shall limit noise increases at the nearest	Implementation of noise reduction measure.	On-site monitor to assure compliance with mitigation measure	Prior to start of construction at St.Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, and Cypress Street Lift Station	U.S. Army Corps of Engineers

#	Mitigation Measure	Implementing Action	Method of Verification	Timing of Verification	Responsible Party
	sensitive receptor to a maximum increase of 10 dBA over ambient noise levels. The Contractor shall monitor noise levels on a daily basis and in response to complaints during construction.				
2	The City shall notify all residents and businesses within 100 feet of the construction staging site for each site of the construction schedule.	Notification to residents and businesses within 100 feet of construction staging areas	Review of notification	Prior to construction at St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, and Cypress Street Lift Station	U.S. Army Corps of Engineers
3	The City shall set up a hotline for noise complaints associated with the proposed Project. All noise complaints shall be investigated, construction noise shall be measured at the site, and the effectiveness of the noise reduction measures shall be re-evaluated. .	Setting up of complaint hot line	Review of hot line call records	Prior to and during construction at St. Andrews Lift Station, Vista del Mar Lift Station, Ocean Park, and Cypress Street Lift Station	U.S. Army Corps of Engineers
VEHICULAR TRAFFIC					
1	At the St. Andrews Lift Station site, signs and persons to direct traffic shall be placed on Seacliff Drive at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s)	Placement of signs and personnel at staging area on Seacliff Drive	On-site monitor to assure compliance with mitigation measure	At start of construction at St. Andrews Lift Station	U.S. Army Corps of Engineers
2	At the Vista del Mar Lift Station and Ocean Park sites, signs and persons to direct traffic shall be placed on Ocean Boulevard at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s)	Placement of signs and personnel at staging area on Ocean Boulevard	On-site monitor to assure compliance with mitigation measure	At start of construction at Vista del Mar Lift Station and Ocean Park	U.S. Army Corps of Engineers
3	At the Price Street North and Price Street South sites, signs and	Posting of signs and notices	Review of signs and notices	Prior to construction at	U.S. Army Corps of

#	Mitigation Measure	Implementing Action	Method of Verification	Timing of Verification	Responsible Party
	notices shall be posted warning of the dates and times that Price Street will be closed. The notices shall include identification of alternate routes.			Price Street North and Price Street South	Engineers
4	At the Price Street North and Price Street South sites, signs and persons to direct traffic shall be placed on Price Street at each end of the staging area. Traffic flow shall be controlled so that vehicles in each direction can safely pass through the remaining lane(s) or safely turn around and proceed to the detour.	Placement of signs and personnel at staging area on Price Street	On-site monitor to assure compliance with mitigation measure	At start of construction at Price Street North and Price Street South	U.S. Army Corps of Engineers
UTILITIES					
1	At the Price Street North, Price Street South, and Cypress Street Lift Station sites, the construction contractor shall inform all parties that would be affected by the interruption in electrical service of the date and time that electrical service would be interrupted. The contractor shall work with affected parties to minimize duration of the interruption and any problems that may be caused by the interruption.	Preparation of notice to affected parties	Review of notice	Prior to construction at Price Street North, Price Street South and Cypress Street Lift Station	U.S. Army Corps of Engineers.

APPENDIX G – NAHC COORDINATION

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

May 27, 2009

Mr. Stephen Dibble, Senior Archaeologist – CESPL-PD-RN
U.S. Army Corps of Engineers – Los Angeles District
P.O. Box 532711
Los Angeles, CA 90052-2325

Sent by FAX to: 213-452-4204
Number of pages: 3

Re: Request for a Sacred Lands File search and Native American Contacts List **for the Pismo Beach Shoreline Protection Project** located in Pismo Beach; San Luis Obispo County, California

Dear Mr. Dibble:

The Native American Heritage Commission (NAHC) was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE). The SLF search did indicate the presence of several Native American cultural resources within one-half mile of the project area (APE or 'area of potential effect).

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes that may have knowledge of cultural resources in the project area. We recommend that you contact persons on the attached list of Native American contacts. A Native American tribe or individual may be the only source of information about a cultural resource. A Native American Tribe or Tribal Elder may be the only source of information about a cultural resource.. We also suggest that you contact the nearest information center of the California Historic Resources Information System (CHRIS); a location nearest you can be obtained by calling the Office of Historic Preservation at (916) 653-7278.

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

Native American Contacts
San Luis Obispo County
May 27, 2009

Santa Ynez Tribal Elders Council
Adelina Alva-Padilla, Chair Woman
P.O. Box 365 Chumash
Santa Ynez , CA 93460
elders@santaynezchumash.org
(805) 688-8446
(805) 693-1768 FAX

Mona Olivas Tucker
660 Camino Del Rey Chumash
Arroyo Grande , CA 93420
(805) 489-1052 Home
(805) 748-2121 Cell

Xolon Salinan Tribe
Donna Haro
110 Jefferson Street Salinan
Bay Point , CA 94565

Matthew Darian Goldman
495 Mentone Chumash
Grover Beach , CA 93433
805-748-6913

Salinan Nation Cultural Preservation Association
Doug Alger, Cultural Resources Coordinator
PO Box 56 Salinan
Lockwood , CA 93932
fabbq2000@earthlink.net
(831) 262-9829 - cell
(831) 385-3450

Northern Chumash Tribal Council
Fred Collins, Spokesperson
67 South Street Chumash
San Luis Obispo , CA 93401
(805) 801-0347 (Cell)

Coastal Band of the Chumash Nation
Janet Garcia,Chairperson
P.O. Box 4464 Chumash
Santa Barbara , CA 93140
805-964-3447

Frank Arredondo
PO Box 161 Chumash
Santa Barbara , Ca 93102
805-617-6884
ksen_sku_mu@yahoo.com

This list is current only as of the date of this document.
Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. and the federal NEPA ((42 USC 4321-43351) and Sections 106 and 4(f) of NHPA (16 USC 470(f) et seq.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed U.S. Army Corps of Engineers Project; Pismo Beach Shoreline Protection; located in the coastal area of San Luis Obispo County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Native American Contacts
San Luis Obispo County
May 27, 2009

Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks , CA 91362
805 492-7255
(805) 558-1154 - cell
folkes9@msn.com
Chumash
Tataviam
Fe†rnandeño

Judith Bomar Grindstaff
63161 Argyle Road
King City , CA 93930
(831) 385-3759-home
Salinan

Santa Ynez Band of Mission Indians
Vincent Armenta, Chairperson
P.O. Box 517
Santa Ynez , CA 93460
varmenta@santaynezchumash.org
(805) 688-7997
(805) 686-9578 Fax
Chumash

San Luis Obispo County Chumash Council
Chief Mark Steven Vigil
1030 Ritchie Road
Grover Beach , CA 93433
cheifmvigil@fix.net
(805) 481-2461
(805) 474-4729 - Fax
Chumash

Julie Lynn Tumamait
365 North Poli Ave
Ojai , CA 93023
jtumamait@sbcglobal.net
(805) 646-6214
Chumash

Peggy Odom
1339 24th Street
Oceano , 93445
(805) 489-5390
Chumash

Lei Lynn Odom
1339 24th Street
Oceano , CA 93445
(805) 489-5390
Chumash

Salinan Tribe of Monterey, San Luis Obispo and San Benito Counties
John W. Burch, Traditional Chairperson
8315 Morro Rd, #202
Atascadero , CA 93422
salinantribe@aol.com
805-460-9202
805 235-2730 Cell
805-460-9204
Salinan

This list is current only as of the date of this document.
Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. and the federal NEPA ((42 USC 4321-43351) and Sections 106 and 4(f) of NHPA (16 USC 470(f) et seq.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed U.S. Army Corps of Engineers Project; Pismo Beach Shoreline Protection; located in the coastal area of San Luis Obispo County, California for which a Sacred Lands File search and Native American Contacts list were requested.

May 31, 2010

Josephine R. Axt
Chief, Planning Division
Department of the Army
Los Angeles District, Corps of Engineers

Dear Ms. Axt:

I'm in receipt of your letter with an included map, dated May 21, 2010 regarding the proposed Pismo Beach Storm Damage and Shoreline Protection project. I've discussed your letter with my sister LeiLynn Odom and thank you for contacting us.

The areas descried and highlighted on the map are all areas of very grave concern to our Chumash family. Those areas are well known for its thousands of years of history as home to the Chumash and we believe that it's a certainty that cultural resources will be encountered. We must emphasize that our coastal bluffs and areas near the bluffs were inhabited by indigenous people and ancient villages have been located in the general vicinity.

You have to use extreme caution in any investigation and a well trained and local Chumash monitor must be present for any site surveys. Further decisions can't be made until we know the results of a site survey.

We believe that you'll be respectful of our heritage and that respect will be sincerely appreciated.

Thank you,

Mona Tucker

Mona Tucker
Yak Tityu Tityu
660 Camino Del Rey
Arroyo Grande, CA 93420

APPENDIX G – COMMENTS AND RESPONSES

CHAMBERS GROUP

PISMO BEACH SHORELINE PROTECTION PROJECT RESPONSE TO COMMENTS

Prepared for:

LOS ANGELES DISTRICT
U.S. ARMY CORPS OF ENGINEERS
915 Wilshire Blvd.
Los Angeles, California 90017

Prepared by:

CHAMBERS GROUP, INC.
5 Hutton Centre Dr., Suite 750
Santa Ana, California 92707
(949) 261-5414

In association with:

MOFFATT AND NICHOL
3780 Kilroy Airport Way, Suite 600
Long Beach, California 90806

October 2011

Comment Letter # 1

Original Message-----
From: Andrew Klimkowski [mailto:klimkowski.andrew@gmail.com]
Sent: Monday, December 13, 2010 4:58 PM
To: Smith, Lawrence J SPL
Subject: Re: A Couple of Quick Questions Regarding the Pismo Beach Project

Hello Dr. Axt:

I'm sorry about the first email. Please disregard it. I accidentally sent it.

Here are my questions.

Comment 1-1

1. Who is the Army Corps of Engineers legally required to notify about the Draft Environmental Assessment under NEPA?

The Corps's NEPA regulations talk a lot about who must be notified about a draft or final Environmental Impact Statement (EIS), but the regulations never specifically state who must be notified about a draft EA. The only info I found was in 33 C.F.R. 230.10(a) where it said that the District Commander is responsible for keeping the public informed of the availability of the EA.

Unfortunately, I can't find any information on what that entails. I appreciate your help.

Comment 1-2

2. Who is the Army Corps of Engineers legally required to notify about the Mitigated Negative Declaration under CEQA?

I think I found the answer in Cal. Pub. Res. Code 15072. Am I on the right track?

Thank you very much,
Andrew

Response to Comment 1-1:

Legal requirements for public involvement in Draft Environmental Assessments can be found within the Code of Federal Regulations at 40 CFR 1506.6 and Engineering Regulations at ER 200-2-2. The guidance is not very specific. Draft Environmental Assessments should be circulated to "concerned agencies, organizations and the interested public" (paragraph 11, ER 200-2-2). Notification under the California Environmental Quality Act is generally wider and was adhered to for this project as it was a joint document.

Response to Comment 1-2:

Notification required under CEQA for a Mitigated Negative Declaration may be by one of three methods: a notice in the newspaper, by mail to residents adjacent to the site, or by posting notification on the site. If the project is of regional significance the document needs to be sent to the State Clearing House.

Comment Letter #2

127 Cuyama St.
Pismo Beach, California 93449
December 13, 2010

Office of Chief Environmental Resources Branch
Department of Army,
Los Angeles District Corps of Engineers

Re: plans for sea walls in Pismo Beach, San Luis Obispo County, California
To Whom It Concerns,

Comment 2-1

Armoring our coastline is a very touchy situation especially when the results of seawalls as a remedy for bluff erosion and wave action caused erosion have not yet been proven to work. The exact opposite has been to show that the seawall only works in the exact place that the seawall is constructed but the energy of the ocean and bluff erosion is magnified exponentially at the adjacent flanks of seawalls. The energy created by the forces is neither created or destroyed but altered and moved (the basic theory of energy conservation). This has been proven. In the case of the proposed bluff protection in Pismo Beach as described in your document as a remedy for the problem the same sophomoric approach is taken regarding making isolated instances generalities by voiding the facts to only get the proposal passed for specific goals. Protecting our coastline goes way beyond building seawalls to protect mechanical apparatuses such as lift stations, homes, streets, parks etc. Protecting our coastline is about not infringing on the natural energy of the coastline and how run-off, erosion, wave action, and surge all interplays to create beaches, shorelines, coves, recreational opportunities, access, natural beauty, etc. By employing seawalls as "stop gap" measures is the equivalent of "Military Intelligence" in that you set a goal, enact a battle plan, and win the war. The armoring of our coastline is a war that you are not going to win no matter how many battles you fight. It doesn't take an Engineer with the Corps or a Manager with a strong military background to turn a blind eye to the facts and employ a strategy that will only temporarily produce results until the repaired hole in the dike has to be plugged again and again and again. The seawall will just get bigger and bigger and bigger until, in this case, it infringes on someone's real property that historically was not problematic but becomes an issue because of the energy transferred to the location by constructing a sea wall close to them. Then, erroneously, they are personally responsible for the remedy to protect their property because an adjacent seawall or nearby seawall has transferred the energy of wave action, surge, erosion, and sand exportation to that real property. The lack of foresight and responsibility for such actions lies with the construction of a seawall for a specific purpose without factoring in the long range effects of such an endeavor. The alternative is to remove the obstacles that are being threatened wherever and whenever possible. Protecting the threatened feature closer to the source such as designing lift stations with sheet pile armor adjacent to the lift station without dumping rip-rap or armoring the coastline 20 feet away is much more responsible and environmentally prudent.

Sincerely,

Paul Schiro

Paul Schiro

Response to Comment 2-1:

Improperly designed seawalls do have the potential to cause erosion at their sides. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth sides on the ends of the structures to minimize flanking.

Comment Letter #3

Original Message-----
From: Santa Lucia Chapter of the Sierr <<image003.png>> a Club [mailto:sierraclub8@gmail.com]
Sent: Tuesday, December 14, 2010 7:23 PM
To: Smith, Lawrence J SPL
Subject: SIERRA CLUB COMMENTS ON PISMO BEACH SHORELINE PROTECTION PROJECT EA/MND

logo1chor

Santa Lucia Chapter

P.O. Box 15755

San Luis Obispo, CA 93406

(805) 543-8717

www.santalucia.sierraclub.org

-Via fax and e-mail

December 15, 2010

Mr. Larry Smith (CESPL-PD-RQ)

P.O. Box 532711

Los Angeles, California 90053-2325

fax: (213) 452-4204

<lawrence.j.smith@usace.army.mil <mailto:lawrence.j.smith@usace.army.mil> >

RE: PISMO BEACH SHORELINE PROTECTION PROJECT ENVIRONMENTAL ASSESSMENT/ MITIGATED NEGATIVE DECLARATION

Dear Mr. Smith,

Following are the comments of the Santa Lucia Chapter of the Sierra Club, representing the Sierra Club's members in San Luis Obispo County, on the Corps' plan to add 1,490 feet of rock revetment and/or sea walls to the bluffs at Pismo Beach and a 20-foot sea wall extension off Ocean Boulevard.

In evaluating environmental setting and consequences, the Draft EA finds that for each site geologic environmental consequences will be insignificant, based on the criteria that an impact to geology will be considered significant if a geologic process such as landsliding or erosion were triggered or accelerated.

Comment 3-1

In evaluating cumulative impacts, the EA states "Because most of the sites where new shore protection is proposed have some existing structure, and because none of the proposed structures would extend below mean sea level, the cumulative impacts to biological resources would not result in a substantial change in natural communities, and the impacts would be insignificant."

Both of these statements appear to ignore one of the fundamental facts of coastal armoring, namely that it aggravates erosion on adjacent unarmored coastal areas. The EA appears to be able to come to a conclusion of insignificant impacts only by virtue of limiting its assessment of environmental consequences to the project sites themselves.

Comment 3-2

The alternatives listed in the draft EA are simply a description of the various types of hard armoring the Corps has determined to use at the various project sites. They are not project alternatives. There appears to have been no consideration of soft protection (nourishment, vegetation, drainage controls), or use of the least damaging feasible alternative for hard protection. As the EA does not even acknowledge the significant, long-term and cumulative environmental impacts of coastal armoring, the mitigation proposed does not address those impacts and is therefore insufficient.

Comment 3-3

We have appended for the record an excerpt from the document "Monterey Bay National Marine Sanctuary: Resource Management Issues," which identifies and details many of the site-specific and cumulative geological, biological, and recreational impacts of coastal armoring/sea walls that the EA should have analyzed. Of particular note in this document is its citation to the fact that the U.S. Army Corps of Engineers acknowledged in 1995 that "armoring structures can encroach into the intertidal, or disturb important buff <<image004.jpg>> er areas such as marsh habitat between the marine and terrestrial environments, which naturally mitigate erosion, and play an important role in flushing of certain contaminants."

The potential impacts listed below clearly indicate the insufficiency of the Draft EA/MND and support the need for a full Environmental Impact Statement.

Thank you for your attention to these issues.

mysig.jpg

Director, Santa Lucia Chapter

Attachment:

Monterey Bay National Marine Sanctuary: Resource Management Issues

Environmental impacts of coastal armoring are both site specific and cumulative. The effects vary significantly depending on the type of structure constructed, the magnitude of the project, and the specific geological, biological, and oceanographic conditions in the vicinity of the structure. Thus the impacts of an individual project need to be evaluated on a case-by-case basis. Coastal armoring can potentially damage or alter local coastal habitats, deprive beaches of sand, lead to accelerated erosion of adjacent beaches, hinder access and present problems with public safety.

As with any activity that alters natural processes, there can be significant long-term impacts related to coastal armoring. Currents, waves, and wind normally transport sediment throughout the littoral system. Armoring of the coast can interfere with littoral transport, which in a natural state may reach a dynamic equilibrium. When the availability of sediment is reduced due to the existence of a structure, erosion can increase in other nearby locations. This is due to starvation of the materials that would normally supply these areas. When a structure is constructed, a supply of sediment is effectively being cut off. Armoring also causes deflection of wave energy, which can accelerate erosion of nearby sites, expanding the need for shoreline armoring structures. In some cases, installing coastal armoring begets more coastal armoring. Furthermore, armoring can result in the loss of beach and intertidal areas through a process that has been termed “passive erosion.” Areas that undergoing long-term net erosion experience a natural landward movement of the entire beach system during periods of sea level rise; such has been the case for approximately the last 18,000 years. As cliffs and sand dunes retreat, the vacated area becomes part of the beach environment and the position of the beach shifts landward. Building a protective structure in front of a cliff or dune temporarily stabilizes the seaward location of the cliff or dune edge, however beach erosion continues. Since no new beach area is created through cliff or dune retreat, a net loss of beach area occurs. Ultimately, as erosion continues, this process also will result in the loss of the intertidal zone, as waves impact the seawall at all times, low tide as well as high.

Vertical structures in particular can deflect wave energy causing increased erosion and altering natural habitat in front of the structure. Reflected wave energy may make it difficult for organisms to inhabit the area because of high turbidity. Erosion caused by the reflection of wave energy is more severe with vertical structures than with curved, stepped, or inclined structures, which absorb or disperse the energy of the waves. The significance of this reflected wave energy will vary, depending upon how frequently the wall is inundated or impacted by waves, and how much the reflective characteristics of the wall differ from the natural shoreline8. A wall that is only subject to wave attack once a decade would only alter the reflected wave energy once a decade. Also, a vertical bluff and a vertical wall would have fairly similar reflective characteristics, while a dune and a vertical wall would be very different.

Potential biological impacts of coastal armoring include changes in abundance and distribution of species. Coastal armoring structures can influence the structure of benthic communities, due to potential differences in settlement patterns for natural substrates and armoring structures. Armoring structures can encroach into the intertidal, or disturb important buffer areas such as marsh habitat between the marine and terrestrial environments, which naturally mitigate erosion, and play an important role in flushing of certain contaminants9. Certain structures can also provide habitat for predatory species not normally associated with the beach and intertidal zone such as rats and squirrels, which can feed on intertidal organisms, compete for food with native species, and transmit disease.

Seawalls can have recreational impacts as well, by blocking both vertical and lateral access to beaches, and altering wave patterns, which can negatively impact surfing conditions. Additionally, coastal armoring can act as a barrier to wildlife, by blocking access of certain species to the beach.

CITATIONS:

1. California Resources Agency. Draft Policy on Coastal Erosion Planning and Response and Background Material. March, 2001

2. California Resources Agency. March, 2001.

3. Griggs, Gary B., Pepper, James E. and Jordan, Martha. California's Coastal Hazards: A Critical Assessment of Existing Land-use Policies and Practices. California Policy Seminar, University of California. 1992.

4. U.S. Army Corps of Engineers. Engineer Manual. Design of Coastal Revetments, Seawalls, and Bulkheads. 1995.

5. California Coastal Commission. ReCAP Pilot Project Findings and Recommendations: Monterey Bay Region. September, 1995.

6. Griggs, Gary. California Needs a Coastal Hazard Policy. Coast and Ocean Magazine. Volume 13, No. 3. 1998.
http://www.coastalconservancy.ca.gov/coast&ocean/autumn98/a04.htm
<http://www.coastalconservancy.ca.gov/coast&ocean/autumn98/a04.htm> .

7. Monterey Bay National Marine Sanctuary Final Environmental Impact Statement/Management Plan. Appendix F, Page 36. June, 1992.

8. Griggs, Pepper and Jordan. 1992

9. U.S. Army Corps of Engineers. 1995

http://montereybay.noaa.gov/resourcepro/resmanissues/coastal.html

Response to Comment 3-1:

Erosion of beaches fronting shoreline structures is generally attributable to toe scour effects from poorly designed seawalls, and not wave reflection. For the proposed Pismo Beach structures, the intent is to design the structure so as to preclude return water from scouring the beach, by embedding the structure toe into bedrock, providing an armor stone toe apron, and proper elevation of the structure crest to prevent/minimize overtopping. Monitoring of beaches in Santa Cruz County at sites with and without revetments and seawalls showed that the beach profile adjusts nearly identically in front of revetments compared to locations without revetments. Revetment did not cause measurable erosion in front of the structures. The erosion that was measured was from the effects of reflection of the ends of the walls that are angled to the wave approach. These flank/end effects are discussed below.

There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to "rip currents" at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered and, accordingly, the ends of the structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

Response to Comment 3-2:

The proposed project is to protect the toe of the bluffs from wave erosion. Therefore, alternatives considered in the EA are other alternatives to protect the bluff toe. Alternatives such as vegetation and drainage controls that would protect the top of the bluffs would not address bluff toe erosion. Beach nourishment was considered but was not carried forward as an alternative for detailed analysis because the impacts of delivering sand to project area beaches would be greater than the impacts of constructing sea walls or revetments. Sand would probably need to be pumped to project sites from an offshore barge with potential impacts to kelp beds and marine mammals. In addition, because of the high wave energy in the project area, sand would not be expected to stay at the project sites for long. Therefore, nourishment would have an extremely short-lived benefit in protecting the toe of the bluffs.

Response to Comment 3-3:

Several issues are raised in the referenced document, "Monterey Bay National Marine Sanctuary: Resource Management Issues." The potential impacts of the proposed project on biological resources were discussed in the EA and determined to be insignificant. The revetments would extend slightly into the upper intertidal and would replace a small amount of sand/cobble beach with rock which supports organisms typical of the high intertidal zone of rocky shores. The revetment alternatives may possibly have some effect on the diversity of organisms in the adjacent intertidal beach.

The potential for structures to accelerate erosion is discussed above in response to Comment 3-1. It is true that bluff protection structures fix the back of the beach and prevent the increase in beaches from passive erosion as the bluff retreats. However, in this case, the "vacated area" is the area currently occupied by the roads, bluff top parks and trails, and lift stations that the project is trying to protect to remain in place.

Another concern raised is the impact of the structures on wave patterns. The structures will not alter the offshore bathymetry and thus will not affect the shape of the waves as they come ashore. Wave reflection may occur when the structure, especially a vertical wall, is within the wave uprush zone. Although the proposed seawalls are to be constructed above the high tide line (based on the September 2009 beach condition) and as landward as possible, the seawalls would be farther seaward than the existing near-vertical bluff face. It is thus likely that the seawall could be within the wave uprush area during other times of year when the beach is in a more eroded stated. During these times of year and high tide conditions, additional wave reflection from the shoreline seawall could occur. This impact to surfing is considered to be relatively small, given that the waves are already modified by the existing nearshore rocky reefs and bluff shorelines at most sites, the small shoreline length of the structure relative to the overall bluff face length in each of the areas, and the limited times of year when reflection could occur.

Comment Letter #4

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

December 14, 2010

Larry Smith
U.S. Army Corps of Engineers
915 Wilshire Boulevard
Los Angeles, CA 90017

RE: SCH# 2010114001 Pismo Beach Shoreline Protection Project; San Luis Obispo County.

Dear Mr. Smith:

The Native American Heritage Commission (NAHC) has reviewed the Notice of Completion (NOC) referenced above. The California Environmental Quality Act (CEQA) states that any project that causes a substantial adverse change in the significance of an historical resource, which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA Guidelines 15064(b)). To comply with this provision the lead agency is required to assess whether the project will have an adverse impact on historical resources within the area of project effect (APE), and if so to mitigate that effect. To adequately assess and mitigate project-related impacts to archaeological resources, the NAHC recommends the following actions:

Comment 4-1

- ✓ Contact the appropriate regional archaeological Information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.

Comment 4-2

- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

Comment 4-3

- ✓ Contact the Native American Heritage Commission for:
  - A Sacred Lands File Check. . **USGS 7.5 minute quadrangle name, township, range and section required.**
  - A list of appropriate Native American contacts for consultation concerning the project site and to assist in the mitigation measures. **Native American Contacts List attached.**

Comment 4-4

- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst
(916) 653-4040

cc: State Clearinghouse

Native American Contact List
San Luis Obispo County
December 14, 2010

Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks, CA 91362
folkes@msn.com
805 492-7255
(805) 558-1154 - cell
folkes9@msn.com

Chumash
Tataviam
Ferrnandeño

San Luis Obispo County Chumash Council
Chief Mark Steven Vigil
1030 Ritchie Road
Grover Beach CA 93433
cheifmvigil@fix.net
(805) 481-2461
(805) 474-4729 - Fax

Chumash

Santa Ynez Band of Mission Indians
Vincent Armenta, Chairperson
P.O. Box 517
Santa Ynez , CA 93460
varmenta@santaynezchumash.
(805) 688-7997
(805) 686-9578 Fax

Chumash

Peggy Odom
1339 24th Street
Oceano , 93445
(805) 489-5390

Chumash

Barbareno/Ventureno Band of Mission Indians
Julie Lynn Tumamait
365 North Poli Ave
Ojai , CA 93023
jtumamait@sbcglobal.net
(805) 646-6214

Chumash

Santa Ynez Tribal Elders Council
Adelina Alva-Padilla, Chair Woman
P.O. Box 365
Santa Ynez , CA 93460
elders@santaynezchumash.org
(805) 688-8446
(805) 693-1768 FAX

Chumash

Lei Lynn Odom
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Oceano , CA 93445
(805) 489-5390

Chumash

Randy Guzman - Folkes
655 Los Angeles Avenue, Unit E
Moorpark , CA 93021
ndnRandy@yahoo.com
(805) 905-1675 - cell

Chumash
Fernandeño
Tataviam
Shoshone Paiute
Yaqui

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2010114001 Pismo Beach Shoreline Protection Project; San Luis Obispo County.

Native American Contact List
San Luis Obispo County
December 14, 2010

Coastal Band of the Chumash Nation
Vennise Miller, Chairperson
P.O. Box 4464 Chumash
Santa Barbara CA 93140
805-964-3447

Salinan-Chumash Nation
Xielolixii
3901 Q Street, Suite 31B Salinan
Bakersfield , CA 93301 Chumash

408-966-8807 - cell

Mona Olivas Tucker
660 Camino Del Rey Chumash
Arroyo Grande CA 93420
(805) 489-1052 Home
(805) 748-2121 Cell

Northern Chumash Tribal Council
Fred Collins, Spokesperson
67 South Street Chumash
San Luis Obispo CA 93401
fcollins@northernchumash.
(805) 801-0347 (Cell)

Matthew Darian Goldman
495 Mentone Chumash
Grover Beach CA 93433
805-748-6913

Frank Arredondo
PO Box 161 Chumash
Santa Barbara Ca 93102
ksen_sku_mu@yahoo.com
805-617-6884
ksen_sku_mu@yahoo.com

Santa Ynez Band of Mission Indians
Tribal Administrator
P.O. Box 517 Chumash
Santa Ynez , CA 93460
info@santaynezchumash.
(805) 688-7997
(805) 686-9578 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2010114001 Pismo Beach Shoreline Protection Project; San Luis Obispo County.

Response to Comment 4-1:

The project is in compliance with Section 106 of the National Historic Preservation for the two selected sites. The California State Historic Preservation Officer has concurred with the procedures we implemented; no further actions are required.

Comment Letter #5

To Whom it May Concern *December 15. 2010*

From:

John D Duffy

California Registered Geologist

California Certified Engineering Geologist

128 Baker Ave

Shell Beach, CA 93449

805-773-0556

From page 30.

The rock revetment alternative was selected for the St. Andrews Lift Station site. Two alternatives at this site (rock revetment and concrete vertical wall) have BC ratios greater than one and meet NED criteria. The rock revetment alternative was selected due to its lower cost, to the existence of rock at the site, and the lack of public access to the beach at this site.

The sculpted concrete wall alternative was selected for the St. Andrews Lift Station site. All three alternatives have BC ratios greater than one and meet NED criteria. The rock revetment alternative was not selected because this site has more of a beach and the revetment footprint is larger and more intrusive onto the beach, which does have public access that could be affected. The vertical concrete wall alternative at the Vista del Mar Lift Station is considered to be aesthetically less pleasing, and the sculpted concrete wall is preferred even with its additional costs.

Comment 5-1

Comment: It appears that the revetment and wall were chosen for St Anne's. Is this the case? The beach at this locations is a resource used by many people for a variety of uses, fishing, collecting beach glass, picnics, and surfing. The revetment will destroy this resource. The beach will be gone. Somewhere along the way somebody missed something because this location has beach access and this will be gone with the revetment. People

Comment 5-1

continued

scramble down the bluffs on a daily basis particularly for surfing. When there is a swell in and surf is good there may be 40 people in the water all day long. About 60% of those people access the water from St. Anne's. In one day during a good swell there may be 200 roundtrips by the multitude of surfers throughout the day going up and down the trail. This does not appear to have been documented in the report. It has even been recognized in the local News when them come to St Anne's to film the surfing.

The revetment will destroy a recreational beach and access to some of the best surfing in the county featured in magazines and on web sites. A different alternative should be considered. I live in this neighborhood and have a record of using this trail with friends and family regularly for over 20 years. The revement is not the best choice given the loss of resources.

Page 45 to 46

4.1.2.2 St. Andrews Lift Station

Alternative 1: Rock Revetment

The bluffs at the St. Andrews Lift Station site are experiencing severe erosion. The erosion has exposed pipes. A seawall has been constructed to protect the bluffs, but erosion is still occurring. Construction of a revetment at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The revetment would help to halt the erosion that currently is occurring. A revetment at the foot of the bluffs would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. The alongshore length of the revetment at this site was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology *of a revetment at the St. Andrews Lift Station would be insignificant.*

Comment 5-2

Comment: Incorrect. The revetment would destroy the beach that is a resource and the access to the beach and to the surfing. There is an access path used by thousands of people during the last 20 years alone.

Alternative 2: Vertical Sea Wall

The impacts to geology of a vertical sea wall at the St. Andrews Lift Station site would be similar to those of the rock revetment. Construction of a vertical sea wall at this site would not adversely affect a unique geological structure or render a known mineral resource inaccessible. The vertical sea wall would help to halt the erosion that currently is occurring. The sea wall would be confined to the area necessary to stop the severe erosion and would not be a substantial alteration of topography. As was true of the revetment, the length of the seawall was based on tying into existing shoreline features to prevent flanking and resultant erosion around the end of the structure. The impacts to geology of a vertical sea wall at the St. Andrews Lift Station would be insignificant.

Alternative 3: Sculpted Concrete/Shotcrete Wall

The impacts to geology of a sculpted concrete/shotcrete wall at the St. Andrews Lift Station site would be the same as those of a vertical sea wall and would be insignificant.

No Action Alternative

Under the No Action alternative, the bluff at the St. Andrews Lift Station site would continue to erode. The No Action alternative would not accelerate this process, but it also would not address the erosion issue. If an emergency revetment or seawall were constructed to reduce erosion at the *site, it might not be designed to prevent flanking and scour around the end of the structure.*

Page 54

4.2.2 Environmental Consequences

4.2.2.1 Significance Criteria

An impact to oceanography will be considered significant if alteration of water quality results in:

- deleterious effects on human, animal, or plant life;

Comment 5-3

Comment: It would in that the revetment would have deleterious effects on humans due to elimination of the beach and access to the beach, fishing and surfing.

- substantial impairment of beneficial recreational use of the beach and/or ocean;

Comment 5-4

Comment: See all comments above. I see the study was done by firms in Southern California and ask this: When and how much time was spent at the site observing the day use of the beach and surfing and the trail use down to that beach?

- exceedances of water quality objectives from the California Ocean Plan; creation of pollution, contamination; or

- a nuisance as defined in Section 13050 of the California Water Code.

Response to Comment 5-1:

Construction of a structure at the St. Andrews Lift Station site would affect the existing informal path to the pocket beach at the site. Thank you for your information about the high level of use of the informal trail at the St. Andrews Lift Station site. Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 5-2:

The beach at the site would still be accessible during low tides. Under the existing conditions there is little beach at the site during high tides. Therefore, the loss of some additional beach during high tides is considered an insignificant impact.

Response to Comment 5-3:

Please see the response to Comment 5-1. The construction of a revetment at the St. Andrews Lift Station site, would eliminate an informal access path and reduce the amount of beach at the site. Although this impact would have an adverse effect on people who use the beach at this site, it was considered insignificant because of the small amount of beach and the fact that other, safer access points are available in the immediate Shell Beach area. However based on the input to the Draft EA/MND, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 5-4:

The preparers of the EA visited the sites twice. However, they coordinated with the staff of the City of Pismo Beach. City staff have visited the sites on many occasions.

Comment Letter #6

Original Message-----
From: Terry Lilley [mailto:underwater2web@gmail.com]
Sent: Wednesday, December 15, 2010 12:12 PM
To: Smith, Lawrence J SPL
Cc: sierraclub8@gmail.com; ezjerky123@yahoo.com; sdamron@surfrider.org; jim@surfrider.org; Cgrl; David Georgi; Carol Georgi; dwendt@calpoly.edu; sbeach99@charter.net

Subject: Biologist Comments On Shell Beach Seawalls about ESA Violations

Hi Lawrence,

I am a marine biologist who graduated from Cal Poly San Luis Obispo in 1981. See attached doc. I have been studying the Shell Beach coastline above and underwater for over 25 years. I have spent over 16,000 hours in the sea along the SLO coastline. I have over 2,000 hours of HD video of our reefs and marine life underwater in SLO Co. I have an educational underwater DVD series that is being used by the CA Coastal Commission, a number of universities, DFG, Surfrider, The Sierra Club, Reef Check, Ships to Reef, Ocean Futures, Monterey Bay Aquarium, Monterey Bay Marine Sanctuary program and many other groups and organizations, as an educational tool.

Comment 6-1

I also have over 1,000 hours of HD video of the Shell Beach bluff, beaches, coastal sealife and surf. I have over 50,000 still pictures of these places over the past ten years documenting the changing bluffs, beaches, surf and marine life and how they relate to each other.

My latest full length movie is called "Central Coast Kelp Forest" and has been shown in several theaters in CA and also many marine science school and university classes. It will be in major book stores soon with my Hawaii movies.

I have given many talks on this subject and supplied pictures and video to the City of Pismo Beach about our bluff and marine life issues and I have done several full length DVDs of the problems that were submitted to the city, state and federal governments over the past five years. Your project was initiated in part, by my video documentation.

I have more underwater time (over 3,000 scuba dives) in the San Luis Obispo area than any other scientist and I have almost all the reefs along the Shell Beach Coastline shot in HD video.

All of my experience in this area tell me that building large seawalls on the Shell Beach bluffs WILL do massive harm to the Shell Beach near shore marine life! I can prove this by documenting the problems with all the illegal smaller seawalls, I have studies over the past ten years.

Comment 6-2

Our reefs are made up of bluff material that has fallen into the sea over time. This material supplies the habitat for sea creatures. This material over time breaks up in the surf and makes

the sand for beaches south of Shell Beach. New material MUST fall into the sea yearly to replenish the reef habitat for species like the ENDANGERED black abalone.

Comment 6-2

continued

Putting seawalls on the bluffs stops the bluffs from falling into the sea and keeping this important cycle going. I have also done 20 years of marine life and coastal erosion studies at San Onofre CA. When they built the power plant they filled in the bluffs with concrete and sand to stabilize them. This killed the reef and most of the marine life. The same thing will happen if you stabilize the bluffs in Shell Beach and Pismo Beach!

Comment 6-3

I have been a professional witness in many State and Federal cases where I had to document violations of the Endangered Species Act, The Migratory Bird Act and several other State laws. Building seawalls along the coastline WILL violate these laws and I feel I can EASILY prove it with 25 years or study, 2,000 hours of HD video and 50,000 pictures. I have spent over 70 different days in court debating these laws.

Many of these videos and pictures will soon be on my underwater educational blog at http://terrylilley.wordpress.com and you can google my name to find dozens of other movies I have done.

I have also done over 100 news and TV stories (CNN, Channel 2 and 9, KSBY,KCOY) about our coastal wildlife, marine life, beaches, bluffs and surf.

I would be happy to meet with you and show you my research but I now live in Kauai so there would need to be some travel expenses.

I would rather show you all my documentation now to stop this madness about building seawalls, than supplying it in court for violations of the ESA down the road.

Comment 6-4

Sorry if I was long winded about my background. I do not have an ego about it but I do love and know many of the Shell Beach sea creatures by fist name! Sue Sloan and myself did scuba dives almost daily for several years in Shell Beach and we got to know much of the sea life and we will do what we can to protect them, just like you may protect your children.

Seawalls will effect their habitat just like a concrete barrier around your house would effect your habitat!

If people were dumb enough to build a house or hotel right on the bluffs, then they should be liable for removing their structure before it falls into the sea. They should not be rewarded for their efforts by having sea walls built and destroy the habitat of sea creatures that have been here for 10,000 years!

Feel free to forward this email to anyone you choose.

Aloha,
Terry Lilley
Marine Biologist
Shell Beach CA

Hanalei HI
805-441-2206

Response to Comment 6-1:

The commenter does not specify how the shoreline structures will do massive harm to the Shell Beach marine life. The proposed structures affect a very small amount of intertidal habitat.

Response to Comment 6-2:

The reefs offshore Shell Beach are made up of bedrock. The material that erodes from the bluffs and is transported offshore consists of a small amount of silt and sand that contributes relatively little material to project area beaches. Fugro (2002) estimated that the ongoing erosion of the seacliffs contributed approximately 10,000 to 15,000 cubic yards of sediment to the shoreline each year, of which less than half is likely sand-sized or larger grain sizes that will actually deposit on the beaches. Suitable habitat for black abalone does not exist at any of the proposed sites.

Response to Comment 6-3:

The Endangered Species Act and Migratory Bird Treaty Act were considered in the EA. No significant impacts to listed species were identified. The proposed action would not remove any nesting birds and thus would not violate the Migratory Bird Treaty Act.

Response to Comment 6-4:

Comment noted.

Comment Letter #7

original message----------
From: "Smith, Lawrence J SPL" <Lawrence.J.Smith@usace.army.mil>
To: ndavis@chambersgroupinc.com
Date: Thu, 16 Dec 2010 16:17:55 -0800

From: Carol Georgi <cdgeorgi@hotmail.com>
To: Smith, Lawrence J SPL
Sent: Thu Dec 16 16:11:10 2010
Subject: comment to the Pismo Beach Shoreline Protection Project

Josephine R. Axt, PhD.

Chief, Planning division

U.S. Army Corps of Engineers

Los Angeles District

Attention: Mr. Larry Smith (CESPL-PD-RQ)

Project Environmental Coordinator
(213) 452-3846
fax: (213) 452-4204
email: lawrence.j.smith@usace.army.mil

Dear Mr. Larry Smith,

I am a resident of Pismo Beach and live at 243 Vista del Mar.

Comment 7-1

I am concerned about the lack of public notification and discussion of these 6 proposed seawall projects.

A full study would include the public as to their beach access, beach use, and the proximity of their houses to the projects.

Comment 7-2

I am concerned about the impacts from the construction to the beach and tide pools, and the beach access.

And, I am concerned about the long-term impacts from the armoring.

First, **St. Andrews Lift Station:**

Comment 7-3

My concern is for the people who have continuously used this beach. My son and his friends have used this beach and have surfed in this location for over 30 years.

There is a trail from Memory Park down to the beach, and yesterday, I met a retired man with his dog coming up the trail. He said he goes here everyday and would be lost without this beach access. Since the army corps plans to place boulders on the beach, the beach will be destroyed, access denied, tide pools damaged or destroyed, and more.

Second, **Vista del Mar Lift Station:**

Placing a cement seawall at this location will affect the viability of the tide pools both during and after construction.

Since there is a private seawall on the other side of the stairs, the combination of both seawalls with the stairs in-between will result in extreme erosion behind the stairs.

Comment 7-4

My concern is that there has been a study as to the possibility of relocating this lift station.

My ocean-front neighbor remembers that the city of Pismo Beach chose to place the lift station ocean-front on Vista del Mar to save money in the short term.

However, now, because of that short-sighted decision, much more money is needed to place a seawall in front of the lift station.

The seawall will eventually wear down, and again, more money will go after this first inappropriate decision to place a lift station on an ocean-front bluff.

In fact, I notice that 3 of the proposed seawalls are due to the poor placement of the lift stations.

Third, **Ocean Park:**

Comment 7-5

My concern is the resulting damage which will occur to the house next to this proposed seawall, beach use and access (neighbors use this beach and there are many trails to it), and the damage/destruction to the tide pools.

Fourth, **Price Street - North:**

Comment 7-6

This beach has stairs to it from the hotel, and it is used often.

My concern is that the beach access is maintained, the beach is not destroyed, and the tide pools are not damaged/destroyed.

Fifth, **Price Street – South:**

I am not familiar with this site.

Sixth, Cypress Street Lift Station:

This location is part of the main beach in Pismo Beach.

Comment 7-7

If the seawall is to protect the lift station at the end of Harloe st, then why is the seawall many more feet longer than is needed?

I am concerned that public money is being used to armor the ocean-front of private structures.

Thank you for allowing my public input to the Pismo Beach Shoreline Protection Project.

Even though I live 8 houses from one of the proposed projects, I did not receive notice of this or the other projects.

I learned of the projects from one of my neighbors who is also very concerned and confused as to why there has been no public input on this project.

Sincerely,

Carol Georgi

243 Vista del Mar

Pismo Beach, CA 93449

Response to Comment 7-1:

The public was notified of the proposed project according to the requirements of NEPA and CEQA.

Response to Comment 7-2:

Impacts to beaches, tidepools and beach access are addressed in the EA/MND

Response to Comment 7-3:

Comment noted. The loss of the access trail at the St. Andrews Lift Station site is discussed in the EA/MND.

Response to Comment 7-4:

The proposed seawall will not eliminate the stairs at the Vista del Mar Lift Station site. The rock revetment would not be placed at the immediate bottom of the stairwell, so there would still be the ability to reach the sandy beach at the bottom of the stairs. Based on a September 2009 survey, the beach at the seaward edge of the revetment is at approximately +4 feet MLLW, so beach access to the east of the stairs would require walking over the revetment rocks during the seasonal time periods when the revetment toe is not buried by sand.

The sea wall has been designed to prevent flank erosion. There is no place to relocate the Vista del Mar Lift Station. Ocean Blvd. and private homes are located inland of the bluffs. The proposed seawall would protect not only the lift station but also the bluff top trail and Ocean Boulevard, which are threatened by erosion.

Response to Comment 7-5:

Construction of a bluff protection structure at the Ocean Park site would not damage any houses. It would help to protect them. The shore protection structures would not extend into the tide pools near this site.

Response to Comment 7-6:

Construction of a bluff protection structure at the Price Street- North site would not affect beach access and would not extend into any tide pools. The construction of a bluff protection structure at this site would affect up to 23 percent of the beach at the site. Therefore, at least 77 percent of the beach would still be available.

Response to Comment 7-7:

The seawall or revetment would also protect Cypress Street.

Comment Letter #8

Larry E. Bonner
200 South Burton Street
Nipomo, CA 93444

December 16, 2010

US Army Corps of Engineers, Los Angeles District
Attn: Josephine R. Axt and Mr. Larry Smith
PO Box 532711
Los Angeles, CA 90053-2325

&

City of Pismo Beach
Attn: Planning Department
760 Mattie Rd.
Pismo Beach, CA 93449

Re: Comments on Draft Pismo Beach Shoreline Protection Project EA/MND

To Mr. Smith and Whom It May Concern at the City of Pismo Beach:

As a member of this community since 1982, a CEQA/NEPA practitioner since 1997, and as an avid surfer since 1988, I am greatly concerned with the unsubstantiated conclusions, lack of technical studies that should have been prepared, lack of full analysis of viable alternatives to avoid and minimize potentially significant environmental impacts, and blatant mistakes contained in the Draft EA/MND prepared for this project. The lack of a detailed Recreation Impacts Analysis, particularly at the St. Andrews project site is a blatant mistake. In addition, the cumulative impact analysis is insufficient and does not come close to meeting the requirements for a legally sufficient analysis as defined by CEQA and NEPA. Lastly, a full EIR should be prepared for this project as there are numerous potentially significant environmental effects that have not been adequately analyzed or discussed and additional viable project alternatives not adequately discussed in this EA/MND. My specific comments are included below:

Comment 8-1

1. Section 1.3 – NEED FOR THE PROPOSED ACTION: This section does not contain any information to support the need statements contained in this section. All of the stated project needs are unsupported and unsubstantiated. In addition this document does not contain any purpose statement as to why this project is being proposed. The statements that, "On-going retreat is likely to continue to..." and that, "…Price street likely will be damaged by erosion…" leave open the possibility that this will not happen, thus the No Action alternative would be the best choice to avoid potentially significant environmental effects.

Comment 8-2

2. Section 2.6 – Initial Construction: The rock revetment alternative chosen for the St. Andrews site is based, in large part, upon a fundamental flaw with this document. This is the conclusion that there is a lack of public access to the beach at this site. Observation of this beach and site during any substantial swell event would have made it known to the project development team and preparers of this document that several hundred trips per day occur at this site. In addition, during extreme swell events, the St. Andrews beach and site is the only option for access to the surf break known as St. Anne's. The rock revetment alternative would effectively eliminate the beach at this location and could cause a substantial safety issue for the users of this significant recreational resource. A full recreation analysis should be prepared for this project for inclusion in the EIR, which should also be prepared.

Comment 8-3

Section 3.0 – NO ACTION: The statements contained in this no action alternative are not supported by any facts, studies, or analysis and are in direct conflict with the statements made in Section 1.3 – NEED FOR THE PROPOSED ACTION. In Section 1.3, it is stated that erosion would likely continue. This leaves open the possibility that erosion may not continue and that some or all of these sites may become stabilized over time. The statement in Section 3.0 NO ACTION that, "The bluffs at these sites would continue to erode and impact property, infrastructure, and coastal access" is in direct conflict with the stated (yet unsubstantiated and unsupported) need for the project. Is erosion likely to continue or will it continue? Until the City of Pismo Beach and the US Army Corps of Engineers fully study and understand the dynamics at each of these six sites, the No Action alternative is the correct alternative to conclude for this document. The burden of proof of the need for this project is upon the Lead Agencies to show. This has not been fully shown in this document.

Comment 8-4

Section 4.2.2: I find it very hard to believe that the threat of a spill of toxic chemicals onto the beach and into the ocean as a result of construction could be, "mitigated to insignificant" with the implementation of the cited mitigation measures. The mitigation measures cited are merely having a "plan" to deal with potential releases of toxic chemicals on the beach. Plans are only as good as their implementation and because the success of the cleanup of such a spill is unknown the stated threats of releases of various toxic chemicals directly onto the beach, into the ocean, and into the intertidal zone is a potentially significant impact that cannot be mitigated. The potential of this threat to these beaches alone warrant the full analysis that an adequately prepared EIR and EIS would contain.

Comment 8-5

Section 4.4.1.1 Terrestrial, Wildlife: Night herons have known roosts throughout Shell Beach and have been severely impacted through the years by activities such as tree removal and tree trimming by the City of Pismo Beach. This species should have been included in the biological surveys conducted for this project and need to be addressed in the EIR and EIS that need to be prepared for this project. Construction noise impacts can cause indirect effects that are potentially significant as these birds are sensitive to disturbances in and near their habitats.

Comment 8-6

Section 4.4.1.2 Marine, Page 95: In this section the document states that, "In accordance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act, an assessment of Essential Fish Habitat (EFH) will be conducted for the proposed Project." My question is when will this be conducted? Why was this required assessment not conducted as part of this environmental document? What will be the procedure for notifying the public,

Comment 8-6 continued

resource agencies, and interested parties about the results of this assessment and how it may affect the project, the selection of alternatives, and the construction methods? This assessment may contain critical information that could alter alternative choices and/or methods of construction. This assessment should be completed prior to issuing the necessary full EIR and EIS for this project so that full disclosure of the potential impacts of this project (a major tenet of CEQA and NEPA) can be made to the public and so that the most informed decision can be made (another major tenet of both CEQA and NEPA) regarding alternative choices.

Comment 8-7

Section 4.4.1.3 La Graciosa Thistle: The document states that this a perennial herb that flowers from May to August yet you conducted your plant surveys in November. The chance of locating this thistle is greatly reduced when surveying so far out of the flowering season. Were any reference sites of known species consulted for comparison of what was surveyed for? Proper protocol surveys should include springtime plant surveys. The conclusion that this federally listed endangered plant is not present in the project area is not based on adequate surveys.

Comment 8-8

Section 4.7 Recreation: This analysis of recreation is woefully inadequate. The lack of acknowledgement of the access at St. Andrews for surfers accessing the surf break known as St. Anne's is a blatant mistake that can and should be corrected in the EIR that is needed for this project. The temporary loss of parking and access during the construction period at this location especially is significant. Upwards of 30 or more cars are parked in this area along Memory Park throughout the entire day and early evening during substantial swell events. There are probably 40 substantial swell days per year at a minimum where St. Anne's will typically have 20 – 40 people surfing all day. The majority of the surfers access the paddle out area from Memory Park and use the beach both as a launching off point and a coming in point during high swell events. The beach often provides a refugia and safety net for surfers who "get in over their head" when surfing a break that can typically be considered easy but that gets much more difficult during high swell events. Over the 20 years I have surfed this break, I have led more than one scared and panicked surfer "in over their head" to the beach below Memory Park and showed them how to get up the trail on the cliff to safety. In addition I have seen Fire personnel use this beach for rescue operations to help injured surfers throughout the years.

Comment 8-9

The temporary loss of parking, the loss of the beach below Memory Park, the impact of the revetment on the surf break, and the loss of access to the beach below Memory Park are all potentially significant impacts that deserve full analysis in an EIR. In addition, d+uring low swell events this beach is commonly used by locals, families, and kids as it is sometimes known as "glass beach". The non-surfers recreate here during low swell events to look for glass and small shells. I have done this many times throughout my life and have seen many people regularly using this beach. The loss of 19% of the beach is significant and should also be fully analyzed in an EIR.

Comment 8-10

Section 5.0 Cumulative Impacts: According to NEPA a cumulative impact is defined as, "the impact on the environmental from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions". The CEQA definition is similar and requires a similar type of analysis as is required under NEPA.

Comment 8-11 Nowhere in the discussion in Section 5.0 is there a discussion of past impacts that have occurred to each of the six project sites. Many of these sites already have revetment structures in place and much of Shell Beach in general has small revetments pockmarked along the coast. The analysis of past actions that have contributed to cumulative impacts is completely missing from this analysis. Therefore any conclusions reached regarding cumulative impacts cannot be substantiated as fact.

Comment 8-12 Nowhere in the discussion of cumulative impacts is there a discussion of the cumulative impact study area for which past actions, other present actions, and reasonably foreseeable future actions can be documented. Without an adequately defined study area, how can one conduct an analysis of cumulative impacts? It is nearly impossible to conduct a true analysis without a spatial boundary within which to discuss the potential cumulative impacts.

Comment 8-13 Lastly, there is no discussion about efforts to find and discuss "reasonably foreseeable future projects". Since the timeline for the project alternatives is a 50 year design life, the analysis of reasonably foreseeable future projects should reach out at least half of this. There was no discussion of long term plans by the City of Pismo, Caltrans or any other owners of lands in the proximity of the project area. Without an adequate analysis of the foreseeable future projects, a true cumulative impact analysis cannot be undertaken. Thus, the cumulative impact discussion in the document (it is certainly not an analysis) is fundamentally flawed.

Comment 8-14 In the EIR/EIS that should be prepared for this project, a true analysis of cumulative impacts is warranted for each of these highly used, highly visible, and sensitive project sites.

This concludes my comments. I request that you please send a hardcopy of the response to these comments along with a hardcopy of any final decision made to the address listed on the first page of this letter. If you wish to contact me about any of my comments, you may do so at lardogsurf@hotmail.com or by phone at 805-748-8170 or by mail at the address listed on the first page of this letter.

Sincerely,

Larry E. Bonner 12/14/10

Larry E. Bonner

Response to Comment 8-1:

The USACE recently has completed a geotechnical assessment of bluff erosion in the project area. The bluffs in the project area are subject to erosion from wave attack as well as from terrestrial forces such as runoff from the top of the bluffs. At all of the sites the study found that marine erosion was greater than subaerial erosion factors. The erosion rate in the project area averaged between 5.6 and 9.4 inches per year. However, bluff failure generally happens in periodic large events.

At the St. Andrews site, there is native rock along the base of the bluffs, but the toe of the bluffs are being undercut by wave erosion. The rate of erosion for the bluffs in the vicinity of St. Andrews lift station is approximately 8 inches per year. The bedrock is unfavorably oriented to the ocean and makes the bottom of the bluffs subject to ongoing marine erosion that is still severe, and subject to more direct wave attack, especially in the exposed areas just upcoast and downcoast of the existing seawall. A well developed notch is still forming along the entire bluff face, just upcoast of the existing sea wall. The location of the proposed structure would prevent the expansion of the notch that follows bedrock and extends to the bluff top.

At the Vista del Mar lift station site, the bedrock on the bluff contains exposed vertical to steeply vertical bedding planes, oriented parallel to the direction of the incoming ocean waves, which further weakens the toe of the cliff and makes the bedrock more susceptible to wave attack. Many sea caves and vertical gullies have formed within the bedrock preferentially aligned with its bedding. Most of the gullies have eroded through the entire thickness of the bedrock and continued into the overlying terrace soils of the cliff along this reach.

Similarly, at the Ocean Park site there are sea caves which continue to erode and eventually form stacks. Throughout the reach, the bedrock contains exposed moderate bedding planes, oriented parallel to the coastline and perpendicular to the incoming ocean waves, which further weakens the toe of the cliff and makes the bedrock even more susceptible to wave attack.

Throughout the reach that includes the Price Street sites, the bedrock contains a series of exposed vertical to steeply vertical bedding planes, orientated parallel to the direction of the incoming ocean waves, and highly weathered-decomposed rock zones, which further weakens the toe of the cliff and makes the bedrock more susceptible to wave attack. Many large 20- foot high sea caves and undercutting have occurred within the bedrock, preferentially aligned with its bedding and decomposed zones. Most of the undercutting has occurred at the bedding planes and has caused the overlying thick bedrock to fall in slabs or layers. The remains of the slabs can be seen as piles of talus and boulders beneath the falls. The eventual sea cave collapse will cause a large amount of bluff to erode in one episode.

At the Cypress Street site bluff erosion appears mostly dependent on episodic wave attack during severe ocean derived storms. As toe erosion occurs, the instability of the marine terrace bluff deposits results in more bluff top retreat as the material seeks a flatter and more stable configuration.

In summary, all six sites exhibit signs of erosion from wave attack. Because waves will continue to attack the bluffs, this erosion will continue without the proposed bluff protection eventually leading to bluff failure and the loss of infrastructure on the bluff tops.

Response to Comment 8-2:

The rock revetment was selected for the St. Andrews Lift Station site because there is no formal public access at that beach, and there are other safer public access points in the Shell Beach area. The informal public access point at this site is acknowledged and discussed in Section 4.7.2.2. Construction of a revetment would not eliminate the beach. The footprint of the revetment would cover 19 percent of the beach at this site Thank you for your information about the high level of use of the informal trail at the St. Andrews Lift Station site. Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 8-3:

As discussed t length in the response to Comment 8-1, there is strong evidence of erosion at all of the six sites. The USACE has performed further studies of the erosion problems in the project area. These studies found that bluff toe erosion by wave attack is occurring at all six sites. Because waves will continue to attack the coast, this erosion will continue.

Response to Comment 8-4:

The only potential for a spill of toxic chemicals during project construction is from construction vehicles should an accident occur. This chance of an accident occurring is relatively small. The Spill Prevention, Containment and Countermeasures Plan would specify specific practices that would reduce the chances of a leak or spill to near zero. Because equipment would only be on the dry beach during low tide, proper containment and clean up measures would prevent any toxic materials from entering the water in the event a spill did occur.

Response to Comment 8-5:

According to the City of Pismo Beach, there are no black-crowned night heron nests near any of the project sites. Furthermore, the project would not trim or remove any trees on the bluffs. Measures would be implemented during construction to reduce the noise of construction equipment.

Response to Comment 8-6:

Impacts to Essential Fish Habitat are discussed in Section 4.4.2.8. of the EA/MND. The National Marine Fisheries Service has reviewed the Draft EA/MND and made recommendations regarding

impacts to Essential Fish habitat. NMFS letter is contained in the comments section of the Final EA/MND.

Response to Comment 8-7:

The plant survey was done by expert botanist Heather Clayton. She is confident she would have recognized La Graciosa Thistle at all of the sites except at Price Street-South where she could not view the vegetation on the bluffs adequately because of the lack of beach access at the site at the time of the survey. The Price Street-South site will be surveyed for La Graciosa Thistle prior to any construction at the site.

Response to Comment 8-8:

The loss of the access path at the St. Andrews Lift Station site is recognized and discussed in Section 4.7.2.2. The temporary loss of parking at that site is discussed in Section 4.11.2.2. The staging area would temporarily eliminate six parking spaces at the site. The temporary loss of six parking spaces is considered insignificant. Comment letters such as yours on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 8-9:

The loss of the access path at the St. Andrews Lift Station site is recognized and discussed in Section 4.7.2.2. The temporary loss of parking at that site is discussed in Section 4.11.2.2. The staging area would temporarily eliminate six parking spaces at the site. The temporary loss of six parking spaces is considered insignificant. Comment letters such as yours on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 8-10:

Cumulative analysis under NEPA and CEQA considers projects that are approved, planned or otherwise reasonably foreseeable. Projects that are already built are part of the existing environment.

Response to Comment 8-11:

Cumulative analysis under NEPA and CEQA considers projects that are approved, planned or otherwise reasonably foreseeable. Projects that are already built are part of the existing environment.

Response to Comment 8-12:

The project area is described in Section 1.2. The project area extends from Memory Park in Shell Beach to Cypress Street.

Response to Comment 8-13:

The City of Pismo Beach was consulted about reasonably foreseeable future projects. Because the project area is fully developed, only two relatively small construction projects are planned.

Response to Comment 8-14:

Cumulative analysis under NEPA and CEQA considers projects that are approved, planned or otherwise reasonably foreseeable. Projects that are already built are part of the existing environment. The cumulative effect of approved and planned projects is addressed in Section 5.

Comment Letter #9

December 16, 2010

Josephine R. Axt, PH.D.
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
Attention: Mr. Larry Smith (CESPL-PD-RQ)
P.O. Box 532711
Los Angeles, California 90053-2325
fax: (213) 452-4204

City of Pismo Beach
Attn: Dwayne Chisam, P.E., Director of Public Works
760 Mattie Rd.
Pismo Beach, CA 93449

RE: PISMO BEACH SHORELINE PROTECTION PROJECT ENVIRONMENTAL ASSESSMENT/ MITIGATED NEGATIVE DECLARATION

Via electronic mail to Larry Smith and Dwayne Chisam

Dear Dr. Axt, Mr. Smith and Mr. Chisam,

Please accept these written comments on behalf of the San Luis Obispo Chapter of Surfrider Foundation ("Surfrider") in regards to the Pismo Beach Shoreline Protection Project Environmental Assessment/Mitigated Negative Declaration ("EA/MND"). Surfrider Foundation is a non-profit environmental organization dedicated to the protection and enjoyment of our world's oceans, waves and beaches, for all people.

In summary, Surfrider finds that there are unmitigated potentially significant environmental effects that could result from project implementation and, therefore, the EA/MND is not sufficient to meet the requirements of CEQA or NEPA. In these comments Surfrider seeks to provide substantial evidence to this effect and respectfully requests that the U.S. Army Corps of Engineers ("Corps") and City of Pismo Beach analyze these potentially significant impacts in an Environmental Impact Statement/Environmental Impact Report ("EIS/EIR").

I. NEPA

Comment 9-1

For reasons discussed below, this draft EA fails to meet the legal requirements of the National Environmental Policy Act ("NEPA"). NEPA is the "basic national charger for protection of the environment." 40 C.F.R. § 1500.1(a). NEPA ensures that federal agencies "will have available, and will carefully consider, detailed information concerning significant environmental impacts"

and that such information "will be made available to the larger [public] audience." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989).

Comment 9-2

NEPA requires the Corps to prepare a detailed Environmental Impact Statement for any "major federal action significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). To determine whether the environmental impact of a proposed project is significant enough to warrant the preparation of an EIS, the agency will often prepare an Environmental Assessment ("EA") beforehand. An EA is a "concise public document that briefly provides evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact." 40 C.F.R. § 1508.9. See also 33 C.F.R. § 230.10. The Ninth Circuit Court of Appeals has stated that to rely merely on an EA an agency must supply "convincing statement of reasons" to explain why a project's impacts are not significant. Save the Yaak Committee v. Block, 840 F.2d 714, 717 (9th Cir. 1988). Furthermore, an EIS must be prepared if "substantial questions as to whether a project…may cause significant degradation of some human environmental factor." Idaho Sporting Congress v. Thomas, 137 F.3d 1146, 1149 (9th Cir. 1998).

Comment 9-3

The Council on Environmental Quality has promulgated regulations to guide agencies in determining whether a proposed project may have a "significant" effect and require an EIR. See 40 C.F.R. § 1508.27. Agencies must evaluate "context" of the project, meaning the significance of the action at the local, regional and national level, and "intensity". Id. The Corps must consider the uncertainty of the effects on the human environment and any unknown risks, the potential precedent for future actions, and any adverse effects to endangered or threatened species. Id. Importantly, significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. 40 C.F.R. § 1508.27(b)(7).

The Ninth Circuit Court of Appeals has held that a plaintiff need not show that significant effects will in fact occur, but if a plaintiff raises substantial questions whether a project may have a significant effect, an EIS must be prepared. Idaho Sporting Congress, 137 F.3d at 1150 (emphasis in original). As the court in Klamath Siskiyou Ctr. v. Boody, 468 F.3d 549, 562 (9th Cir. 2006) observed, "this is a low standard."

II. CEQA

Comment 9-4

Per 14 CCR § 15070, when an Initial Study shows that the project may have potentially significant environmental effects, a Mitigated Negative Declaration can only be prepared if there is no substantial evidence that the project might have a significant effect on the environment. Further, per 14 CCR § 15074(b), the decisionmaking body shall adopt the proposed negative declaration or mitigated negative declaration **only** if it finds on the basis of the whole record before it (including the initial study and any comments received), that there is no substantial evidence that the project will have a significant effect on the environment and that the negative declaration or mitigated negative declaration reflects the lead agency's independent judgment and analysis.

III. Initial Study

Comment 9-5 The letter sent by the Army Corps to Fish and Wildlife did not contain a project description.[1] As such, the Service was not able to provide comment on whether or not threatened or endangered species were present and could only provide a species list.

Comment 9-6 The Initial Study was fundamentally flawed in that it did not consider the impacts to resources in the entirety of the proposed project area. The Initial Study did not consider uses or resources occurring below the bluff top areas of the proposed project area, and thus did not consider impacts that the project might have on these uses or resources. [2]

Comment 9-7 The Initial Study was fundamentally flawed in that it failed to properly identify all environmental factors that could be potentially impacted by the project. Environmental factors which were not selected in the Initial Study checklist and were wrongly omitted from further study include aesthetics. Environmental factors which were not properly characterized include cumulative impacts (i.e. the impacts to adjacent downcoast properties; enhanced erosion at the flank of seawalls) and impacts to recreation (i.e. beach access lost both as a direct result and indirect result (i.e. passive erosion) of the project.

Comment 9-8 The Initial Study inaccurately identifies "less than significant impact" where there is potentially significant impact for air quality (specifically, in the field concerning whether the project would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment. San Luis Obispo County is non-attainment for PM10, and therefore any additional PM10 could result in a significant impact.

Comment 9-9 The Initial Study incorrectly states that the project will have "less than significant impact" concerning the "cumulatively considerable" mandatory findings of significance. Given that coastal armoring can cause flank erosion to unarmored bluffs adjacent to armored areas, it is reasonably foreseeable that the proposed project, if implemented, could have significant impact to adjacent bluffs via enhanced and exacerbated erosion to these areas. Furthermore, in the instance of such exacerbated effects, it is likely that a structural response to protect infrastructure and structures in these adjacent areas would be considered, which could result in cumulative impacts to adjacent and downcoast beaches from active and passive erosion.

IV. EA/MND

Comment 9-10 <u>Alternatives to the Project:</u>
The EA/MND did not study a reasonable range of alternatives to the project. The alternatives studied were dismissed as infeasible, so effectively there were no alternatives to the project studied that could actually have been viable alternatives. Furthermore, the EA/MND failed to

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[1] EA/MND p. 320
[2] EA/MND p. 325 "Surrounding Land Uses and Setting"

include analysis to substantiate the purported infeasibility of the presented alternatives to the project.

Comment 9-11 In the interest of protecting important infrastructure in the long-term (beyond fifty years) as well as protecting local beaches and access to these beaches, Surfrider believes that alternatives analysis should consider the feasibility of alternatives such as relocation of infrastructure.

Comment 9-12 General access concerns- excavation:
Section 2.5 includes discussion of construction of project alternatives. The EA/MND states that, for all sites, the revetment and seawall alternatives would require trench excavation for rock placement below O feet MLLW.[3] The excavated rock is proposed to be placed on the beach or used as backfill. Placing excavated rock on the beach may have additional impacts on beach access and block currently-accessible areas of the beach unnecessarily.

Comment 9-13 Geology, Section 4.1:
Although various project alternatives are said to have been conceptually designed with the intent to prevent flank erosion, there is no specific information or diagrams that depict how structures will, indeed, prevent flank erosion. Thus, conclusions to this effect seem to be perfunctory. Given that the significance criteria established in the EA/MND cites that acceleration of erosion constitutes a significant environmental effect, flank erosion caused by the project would be a potentially significant impact.

Comment 9-14 As for the St. Andrews Lift Station project specifically, project implementation may result in exacerbation of the existing eroded notch that undercuts the bluffs at Memory Park. Failure of this bluff would likely result in the loss of the park area on the bluff top, which would be a significant impact to land use and recreation.

Comment 9-15 Lastly, regarding existing geologic conditions, the document does not address whether existing armoring adjacent to project areas has been permitted. If adjacent armoring is unpermitted, and therefore subject to enforcement action and possible removal, that would significantly change the understood existing geologic conditions.

Comment 9-16 Air Quality, Section 4.3:
The analysis for impacts to air quality in the EA/MND is impermissibly narrow in that it limits its assessment of impacts to sensitive receptors to residences located within 100 feet of the project area, despite the fact that on-road construction vehicles are proposed to follow traffic routes directly through and around neighborhoods, hotels, parks, and other visitor-serving areas (see Figures 2-26 through 2-29). Because of the increased scope of sensitive receptors which were not considered in the analysis, potentially significant environmental effects may remain unstudied and unmitigated.

[3] P. 29

Sea Level Rise, Section 4.3.4.3:

Comment 9-17

We commend the lead agency for including an analysis of sea level rise impacts to the project. However, the analysis inaccurately concludes that because sea level rise would result in a gradual loss of beach with or without the project, the project will have no potentially significant impacts on the loss of beach. While it is true that sea level rise will result in a gradual loss of beach, it is reasonably foreseeable that project implementation will facilitate a more rapid loss of beach both because of wave energy reflection (especially in instances where vertical concrete walls, sculpted concrete walls and sheet pile walls are implemented) and resulting scour as well as the loss of sediment that would be contributed to the sediment supply from the bluffs. This would constitute a potentially significant environmental effect.

Comment 9-18

Additionally, the figures provided in this section inexplicably differ from the projected sea level rise figures provided in the previous Section 4.3.4.2 where the document states that mean sea level rise by 2100 is projected at 3.2 to 4.6 feet. Given that the project's planned life span is fifty years, it seems that the sea level rise figures used for project planning should be a function of the statewide figures unless there is local data to suggest otherwise. Such local data was not provided in the EA/MND.

Biological Impacts, Section 4.4:

The EA/MND establishes several significance criteria against which to measure impacts to marine environments:

> An impact to biological resources will be considered significant if there are:
> • impacts to aquatic plants for 10 years or longer directly or indirectly resulting in substantial changes in species composition or abundance beyond that of normal variability;
> • impacts to attached or free-swimming animals for 10 years or longer directly or indirectly resulting in substantial changes in species composition or abundance beyond that of normal variability;
> • loss of any rare, endangered, or sensitive species or permanent degradation of the habitat of those species; or
> • permanent deterioration or contamination of the aquatic habitat such that the aquatic ecosystem of the site is substantially disrupted.[4]

Comment 9-19

Using these criteria, it appears that the project would have potentially significant impacts on biological resources. This is substantiated by information supplied by the EA/MND itself, citing that:

> In addition to the actual loss of sandy beach habitat to the revetment footprint, there is some evidence that shoreline structures, especially structures that extend below

[4] Section 4.2.2.1 p. 110

mean higher high water elevation, result in a degradation of the macroinvertebrate community by changing community composition and reducing species diversity (Sobcinski et al. 2010). Therefore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself.[5]

Comment 9-20 Further, in Section 4.4.2.8 Summary of Habitat Impacts, the EA/MND cites that the rock revetment alternatives will result in some loss of habitat used by surf zone fishes at all of the sites except the Cypress Street Lift Station.[6]

Recreation, Section 4.7:

Comment 9-21 Policy P-14 of the City of Pismo Beach General Plan/Local Coastal Plan (City of Pismo Beach 1993) states:

> "Immediate Ocean Shoreline – The ocean, beach and the immediate abutting land are recognized as an irreplaceable national resource to be enjoyed by the entire city and region. This unique narrow strip of land should receive careful recognition and planning. The purpose of the beach is to make available to the people, for their benefit and enjoyment forever, the scenic, natural, cultural, and recreational resources of the ocean, beach and related uplands."

The proposed project would have significant unmitigated impacts on public access to beach areas. Some of the impacts are direct; for example, the entire project estimates a loss of nearly two acres of beach.[7] However some of the impacts are indirect, such as potential loss of beach area seaward of and adjacent to proposed project areas due to passive erosion. Below we address specific project sites ad access concerns attributed to these sites.

St. Andrews Lift Station (4.7.2.2)

Comment 9-22 (http://www.californiacoastline.org/cgi-bin/image.cgi?image=200403893&mode=big&lastmode=sequential&flags=0&year=2004)
The EA/MND does not accurately characterize the use of beach, access to the beach, and impacts to access and recreational uses that would result from project implementation at St. Andrews Lift Station. St. Andrews (referred to by locals as St. Anns) is a popular surf spot and is eastward of the project area. Shaft is another surf spot that is located seaward of the project area. The beach below Memory Park and the surf spots are accessed via an informal trail from Memory Park.

Comment 9-23 The EA/MND does not contemplate the loss of vertical or lateral beach access and the interruption to recreational use of the beach and ocean during construction or after project implementation. In fact, the EA/MND states the reason for selecting the rock revetment alternative for this site is because of its lower cost, existence of rock at the site, and lack of public access to the beach.[8] The EA/MND does not select this alternative due to its

[5] p. 111
[6] p. 140
[7] EA/MND p. 273, Appendix B
[8] p. 30

environmental superiority as required by CEQA.[9] Furthermore, the EA/MND errs in citing that there is no public access to this beach and that the project could not result in potentially significant impacts to beach access.

Comment 9-24

Although the document acknowledges that the beach is accessed at present, it inappropriately validates loss of vertical access that would occur through implementation of a seawall alternative by stating that the access is not formal. The Coastal Act, with which the proposed project must be consistent to comply with the Coastal Zone Management Act of 1972[10], does not differentiate between informal and formal access; therefore, the EA/MND does so prejudicially. If the project were to be constructed, the EA/MND states that it would result in a complete loss of vertical access at this point and that the beach would only be accessible laterally during low tides. This would be a significant permanent loss of access that would need to be avoided or mitigated for by providing alternative vertical access at this spot.

Comment 9-25

Even the relatively small amount of data collected in our Beach Access Survey (Appendix A) shows consistent reports of people using the beach and recreating in the waters immediately adjacent to the project area throughout the entire year.

With implementation of the proposed project—rock revetment—a significant amount of presently-accessible beach area would be lost and, furthermore, the remaining beach area would be bisected by the revetment. The EA/MND cites that there is very little beach area here (although it does not quantify the area) and it states that a rock revetment would cover approximately 0.18 acre,[11] or approximately 19 percent of the beach.[12] Given the size of the beach, this would be a significant loss of beach area and a significant loss of existing recreational uses.

Comment 9-26

Interestingly, the EA/MND, in its characterization of impacts from a "no project alternative" in this area concludes that emergency revetments or seawalls could result in a loss of beach area for recreational use.[13]

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[9] 14 CCR § 15021
[10] Section 307, Title 16, U.S. Code Section 1456(c).
[11] P. 157
[12] p. 110
[13] p. 158

Figure 1. St. Andrews Lift Station

Access path to beach from Memory Park. Photo Credit: Carol Georgi 12/11/10

Vista Del Mar (4.7.2.3)

Given that the largest winter swells tend to come from the west,[14] it is reasonably foreseeable that the proposed project at this location would result in flank erosion to exposed unarmored bluffs located southeast of the proposed project.

The sculpted concrete wall alternative (which is the preferred alternative for this location in the EA/MND[15]) could have impacts on the existing stairwell adjacent to the project area due to scour caused by wave energy reflection from the revetment. Unlike rock revetments which tend to dissipate energy due to gaps in the revetment and the angular surface of the revetment, smooth-surfaced concrete revetments tend to reflect wave energy. This can result in scour of sediments that lie in the zone of reflection, such as the sediment underneath and around the existing stairwell. Loss of this stairwell via cumulative impacts of the project would be a significant impact to access, which should have been analyzed in Section 5.7.

Comment 9-27

The rock revetment alternative, if implemented, would place a rock revetment beneath and immediately adjacent to an existing stairwell. By locating a rock revetment here, the eastern portion of the beach currently accessible via the stairwell would not be easily accessible (i.e. without climbing on the rock revetment) during high tides, restricting accessible beach area from this stairway at high tides to a very small area between the stairwell and westerly adjacent seawall. Rock revetments are generally undesirable because of the relatively large footprint on the beach.

Ocean Park (4.7.2.4)

A rock revetment at this location would cover 51 percent of the total beach area at this site,[16] which would be a significant loss of usable beach area. Although this beach is not heavily used,[17] data from our beach access survey indicates that is used regularly by beach goers and tidepoolers.

Comment 9-28

Price Street – North (4.7.2.5)

Beach access is available via a path from the hotel.[18] The loss of beach to the rock revetment footprint would be 0.39 acre, which is 23 percent of the beach at this site.[19] Given that this pocket beach is the only accessible swath of beach area from the trail, this would result in a significant loss of currently-accessible beach.

Comment 9-29

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[14] EA/MND p. 53, Section 4.2.1.2
[15] p. 30
[16] EA/MND p. 120
[17] Appendix A. Beach Access Survey, Surfrider Foundation San Luis Obispo Chapter. Dec. 13 – Dec. 16 2010.
[18] EA/MND p. 157
[19] EA/MND p. 161

Cypress Street (4.7.2.7)

Comment 9-30 The proposed rock revetment alternative would result in a loss of 0.69 acres of sandy beach.[20] The beach near the Cypress Street Lift Station is heavily used by beachgoers.[21] Although this beach is a broad, sandy beach, the proposed project footprint would displace a significant amount of recreationally-used beach area, including existing beach volleyball courts.

Traffic, Section 4.11:

Comment 9-31 Broadly, the EA/MND uses an inappropriate baseline figure for traffic. Although the most significant traffic impacts will occur along neighborhood streets adjacent to the project areas where streets are narrow and designed to accommodate a low level of traffic flow, the EA/MND uses the Average Annual Daily Traffic volumetric figures for traffic on Highway 101 as the baseline against which the number of truck trips through the neighborhood are compared. Therefore, these baseline traffic figures for the neighborhood areas are grossly inaccurate. During construction periods, there are potentially significant impacts to traffic which have not been appropriately characterized or analyzed.

Aesthetics, Section 4.14:

Comment 9-32 If rock revetments were put in place in any of the project areas, there would be significant impacts to aesthetics, particularly regarding views from the beach. Large rockpiles would change the landscape significantly and would be incompatible with the surrounding natural bluffs and/or adjacent armoring (as armored areas are predominantly concrete revetments).

V. Additional Issues

Inappropriate Use of Public Funds to Protect Private Property

Comment 9-33 The proposed project at the Cypress Street site would partially protect private residences where the bluff has continued to retreat underneath hardened armoring of the bluff top. It is inappropriate for the U.S. Army Corps of Engineers or the City of Pismo Beach to extend its project scope to include protection of privately owned property and would constitute to a gift of public funds.

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[20] EA/MND p. 136
[21] EA/MND p. 137
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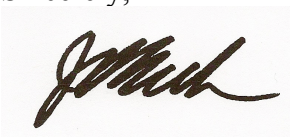
In conclusion, to comply with relevant law promulgated by CEQA and NEPA, Surfrider urges the Corps and City of Pismo Beach to fully analyze the potentially significant environmental impacts associated with this project, as identified in this comment letter, and prepare an Environmental Impact Statement/Environmental Impact Report ("EIS/EIR").

Sincerely,



Jeff Pienack, Chair
Surfrider Foundation
San Luis Obispo Chapter
slo@surfrider.org

Appendix A: Beach Access Survey

1. Please provide contact information to verify the information you will provide on beach use.

Name: - Jennifer Jozwiak
Address: - 200 S. Burton St.
City/Town: - Nipomo
State: - CA
ZIP: - 93444
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - Yes
How do you access the beach? - from st. ann's
How frequently do you visit? - once a week in the late fall, winter, and spring months
How many people are on the beach at the peak time on a “very busy” day? - five
How many surfers are in the water at peak time on a "very busy" day? - 40-50
Roughly how many “very busy” days does this spot see each year? - 30?
How many people are on the beach at the peak time on a “medium attendance” day? - two
How many surfers are in the water on a "medium attendance" day? - 30
Roughly how many “medium attendance” days does this spot see each year? - 40
How many people are on the beach at the peak time on a “slow” day? - 0
How many surfers are in the water on a "slow" day? - 10
Roughly how many “slow” days does this spot see each year? - 60
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - people access the break from memory park also

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - occassionally

How do you access the beach? - from the stairs near Morro St.
How frequently do you visit? - a few times per year (I moved)
How many people are on the beach at the peak time on a “very busy” day? - 25-30
How many surfers are in the water at peak time on a "very busy" day? - one
Roughly how many “very busy” days does this spot see each year? - a few
How many people are on the beach at the peak time on a “medium attendance” day? - 20
How many surfers are in the water on a "medium attendance" day? - 0
Roughly how many “medium attendance” days does this spot see each year? - few
How many people are on the beach at the peak time on a “slow” day? - 5
How many surfers are in the water on a "slow" day? - 0
Roughly how many “slow” days does this spot see each year? - many
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - it's not a popular surfing beach; it's most for kayak and beachgoer access

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).
Do you use this beach- yes or no? - No

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
Do you use this beach- yes or no? - Yes
How do you access the beach? - from the stairs near the best western
How frequently do you visit? - rarely
How many people are on the beach at the peak time on a “very busy” day? - few
How many surfers are in the water at peak time on a "very busy" day? - none
Roughly how many “very busy” days does this spot see each year? - few
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - not a popular surf spot

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
Do you use this beach- yes or no? - yes
How do you access the beach? - from wilmar or wadsworth stairs
How frequently do you visit? - several times per week

How many people are on the beach at the peak time on a “very busy” day? - 200+ and more on holidays and weekends in the summer

How many surfers are in the water at peak time on a "very busy" day? - 80-100

Roughly how many “very busy” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “medium attendance” day? - 100+

How many surfers are in the water on a "medium attendance" day? - 50

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - 30

How many surfers are in the water on a "slow" day? - 20-30

Roughly how many “slow” days does this spot see each year? - 80

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - this is a very popular beach during the summer, holidays and summer weekends

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Jack Turner

Address: - 1144 Leff St.

City/Town: - San Luis Obispo

State: - CA

ZIP: - 93401

Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes

How do you access the beach? - climb down the cliff at the end of Baker St.

How frequently do you visit? - once a week

How many people are on the beach at the peak time on a “very busy” day? - 10

How many surfers are in the water at peak time on a "very busy" day? - 30

Roughly how many “very busy” days does this spot see each year? - at least every weekend, maybe 100-150 total

How many people are on the beach at the peak time on a “medium attendance” day? - 5

How many surfers are in the water on a "medium attendance" day? - 15

Roughly how many “medium attendance” days does this spot see each year? - the rest of the year, 200+

How many people are on the beach at the peak time on a “slow” day? - 1

How many surfers are in the water on a "slow" day? - 1 or 2

Roughly how many “slow” days does this spot see each year? - rarely, you have to get lucky to get it to yourself

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - It is rather difficult to access, but with a little effort it is definitely do-able.

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - no

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - no

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - no

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - john d duffy

Address: - 128 baker ave
City/Town: - shell beach
State: - CA
ZIP: - 93449
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).
Do you use this beach- yes or no? - yes
How do you access the beach? - via the rudimentary path from Baker ave
How frequently do you visit? - weekly and often daily
How many people are on the beach at the peak time on a “very busy” day? - during good surf a dozen rotating through
How many surfers are in the water at peak time on a "very busy" day? - 40 to 50
Roughly how many “very busy” days does this spot see each year? - perhaps 100 days per year
How many people are on the beach at the peak time on a “medium attendance” day? - approximately 6
How many surfers are in the water on a "medium attendance" day? - 20 to 25
Roughly how many “medium attendance” days does this spot see each year? - Perhaps 100
How many people are on the beach at the peak time on a “slow” day? - approximately 1 to 2
How many surfers are in the water on a "slow" day? - 10
Roughly how many “slow” days does this spot see each year? - approx 100
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - people use thi beach to collect sea glass, fish, picnic and wlak the dog

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).
Do you use this beach- yes or no? - yes
How do you access the beach? - via the stairs
How frequently do you visit? - 10 to 20 times a year

How many people are on the beach at the peak time on a “very busy” day? - dozens

How many surfers are in the water at peak time on a "very busy" day? - several

Roughly how many “very busy” days does this spot see each year? - this beach is used year around by many people

How many people are on the beach at the peak time on a “medium attendance” day? - dozens

How many surfers are in the water on a "medium attendance" day? - a few

Roughly how many “medium attendance” days does this spot see each year? - this beach is used year around by many people

How many people are on the beach at the peak time on a “slow” day? - this beach is used year around by many people

How many surfers are in the water on a "slow" day? - none

Roughly how many “slow” days does this spot see each year? - this beach is used year around by many people

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - a very popular spot for kayakers. They are there daily year around

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - yes

How do you access the beach? - down the trail fom the hotel or by kayak from the stairs at dinosaur caves

How frequently do you visit? - several times a year

How many people are on the beach at the peak time on a “very busy” day? - dozens

How many surfers are in the water at peak time on a "very busy" day? - a couple

Roughly how many “very busy” days does this spot see each year? - a 100

How many people are on the beach at the peak time on a “medium attendance” day? - a dozen

How many surfers are in the water on a "medium attendance" day? - none

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - several

How many surfers are in the water on a "slow" day? - none

Roughly how many “slow” days does this spot see each year? - 100

Is there any other important information about this spot? (i.e. difficult to access, method

of access, other prominent uses of the beach) - good beach for picnics and kayaks and fishing

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - yes

How do you access the beach? - the stairs at wadsworth

How frequently do you visit? - several times a year

How many people are on the beach at the peak time on a “very busy” day? - dozens

How many surfers are in the water at peak time on a "very busy" day? - a dozen

Roughly how many “very busy” days does this spot see each year? - 150

How many people are on the beach at the peak time on a “medium attendance” day? - a dozen

How many surfers are in the water on a "medium attendance" day? - several

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - several

How many surfers are in the water on a "slow" day? - a few

Roughly how many “slow” days does this spot see each year? - 75

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - very popular with walkers

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Vincent Shay

Address: - 1690 OCononr Way

City/Town: - San Luis Obispo

State: - CA

ZIP: - 93405

Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes

How do you access the beach? - kayak, surfboard, stand up paddeboards, swimming

How frequently do you visit? - 7 days per week

How many people are on the beach at the peak time on a “very busy” day? - from 1-200

How many surfers are in the water at peak time on a "very busy" day? - 1-50

Roughly how many “very busy” days does this spot see each year? - 200 days

How many people are on the beach at the peak time on a “medium attendance” day? - 1-50

How many surfers are in the water on a "medium attendance" day? - 1-50

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - 1-50

How many surfers are in the water on a "slow" day? - 1-50

Roughly how many “slow” days does this spot see each year? - 65

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - sensitive environment, reefs, sea life, otters, birdlife, etc

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - yes

How do you access the beach? - kayak, stand up paddleboard, swim, surfboard

How frequently do you visit? - 7 days per week on average, surf here alot

How many people are on the beach at the peak time on a “very busy” day? - 1-30

How many surfers are in the water at peak time on a "very busy" day? - 1-10

Roughly how many “very busy” days does this spot see each year? - 200

How many people are on the beach at the peak time on a “medium attendance” day? - 1-10

How many surfers are in the water on a "medium attendance" day? - 1-10

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - 1-30

How many surfers are in the water on a "slow" day? - 1-10

Roughly how many “slow” days does this spot see each year? - 65

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - sensitive environment, reefs, sea life, otters, birdlife, etc

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - yes

How do you access the beach? - kayaks, stand up paddeboards and surfboards

How frequently do you visit? - 1-7 days per week

How many people are on the beach at the peak time on a “very busy” day? - 5-20

How many surfers are in the water at peak time on a "very busy" day? - 1-3

Roughly how many “very busy” days does this spot see each year? - 200

How many people are on the beach at the peak time on a “medium attendance” day? - 5-20

How many surfers are in the water on a "medium attendance" day? - 1-3

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - 1-20

How many surfers are in the water on a "slow" day? - 0-3

Roughly how many “slow” days does this spot see each year? - 65

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - sensitive environment, reefs, sea life, otters, birdlife, etc

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - yes

How do you access the beach? - kayak, surfboard, stand up paddleboard

How frequently do you visit? - 1-7 days per week

How many people are on the beach at the peak time on a “very busy” day? - 1-20

How many surfers are in the water at peak time on a "very busy" day? - 0-5

Roughly how many “very busy” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “medium attendance” day? - 1-20

How many surfers are in the water on a "medium attendance" day? - 0-5

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - 1-20

How many surfers are in the water on a "slow" day? - 0-5

Roughly how many “slow” days does this spot see each year? - 165

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - sensitive environment, reefs, sea life, otters, birdlife, etc

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - not really

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - sensitive environment, reefs, sea life, otters, birdlife, etc

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - not really

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - sensitive environment, reefs, sea life, otters, birdlife, etc

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Jordan Larson

Address: - 202 Vista Del Mar

City/Town: - Pismo Beach

State: - CA

ZIP: - 93449

Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes

How do you access the beach? - down the hillside,over the drainage pipe

How frequently do you visit? - every other week

How many people are on the beach at the peak time on a “very busy” day? - 5 in summers

How many surfers are in the water at peak time on a "very busy" day? - 10-15

Roughly how many “very busy” days does this spot see each year? - maybe 10

How many people are on the beach at the peak time on a “medium attendance” day? - none to 2

How many surfers are in the water on a "medium attendance" day? - 5
Roughly how many “medium attendance” days does this spot see each year? - 200
How many people are on the beach at the peak time on a “slow” day? - none
How many surfers are in the water on a "slow" day? - 2
Roughly how many “slow” days does this spot see each year? - 150
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - I love that it is a secluded, nice open beach

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - yes
How do you access the beach? - stairway at end of Vista Del Mar
How frequently do you visit? - daily
How many people are on the beach at the peak time on a “very busy” day? - 20
How many surfers are in the water at peak time on a "very busy" day? - 0-1
Roughly how many “very busy” days does this spot see each year? - 50
How many people are on the beach at the peak time on a “medium attendance” day? - 12
How many surfers are in the water on a "medium attendance" day? - large swell, 5
Roughly how many “medium attendance” days does this spot see each year? - 150
How many people are on the beach at the peak time on a “slow” day? - 5-6
How many surfers are in the water on a "slow" day? - large swell, 5, no swell 0
Roughly how many “slow” days does this spot see each year? – 165

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no
How do you access the beach? - I don't
How frequently do you visit? - don't
How many people are on the beach at the peak time on a “very busy” day? - none
How many surfers are in the water at peak time on a "very busy" day? - none
Roughly how many “very busy” days does this spot see each year? - none
How many people are on the beach at the peak time on a “medium attendance” day? - none
How many surfers are in the water on a "medium attendance" day? - none
Roughly how many “medium attendance” days does this spot see each year? - none
How many people are on the beach at the peak time on a “slow” day? - none

How many surfers are in the water on a "slow" day? - none
Roughly how many “slow” days does this spot see each year? - 365
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - hard to access

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
Do you use this beach- yes or no? - yes
How do you access the beach? - down the stairs
How frequently do you visit? - 3-4x/month
How many people are on the beach at the peak time on a “very busy” day? - 8
How many surfers are in the water at peak time on a "very busy" day? - none
Roughly how many “very busy” days does this spot see each year? - 50
How many people are on the beach at the peak time on a “medium attendance” day? - 3
How many surfers are in the water on a "medium attendance" day? - none
Roughly how many “medium attendance” days does this spot see each year? - 200
How many people are on the beach at the peak time on a “slow” day? - 0-2
How many surfers are in the water on a "slow" day? - none
Roughly how many “slow” days does this spot see each year? - 105
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - beautiful beach, that one can use year round

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
Do you use this beach- yes or no? - no

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1. Please provide contact information to verify the information you will provide on beach use.
Name: - Nancy Graves
Address: - PO Box 109
City/Town: - Grover Beach
State: - CA
ZIP: - 93483

Email Address: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - Yes
How do you access the beach? - on foot
How frequently do you visit? - 2-3 times a year

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - Yes
How do you access the beach? - on foot
How frequently do you visit? - 2-3 times a year

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - Yes
How do you access the beach? - on foot
How frequently do you visit? - 2-3 times a year

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - Yes
How do you access the beach? - on foot
How frequently do you visit? - 2-3 times a year

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - Yes
How do you access the beach? - on foot
How frequently do you visit? - 2-3 times a year

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - Yes
How do you access the beach? - on foot
How frequently do you visit? - 2-3 times a year

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - THOMAS DANFIELD
Address: - 3751 SANTO DOMINGO ROAD
Address 2: - [redacted]
City/Town: - ARROYO GRANDE
State: - CA
ZIP: - 93420-6119
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

Yes

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes
How do you access the beach? - trail and sometimes access stairs
How frequently do you visit? - 5-10x/year
How many people are on the beach at the peak time on a “very busy” day? - 50-75
How many surfers are in the water at peak time on a "very busy" day? - 10-15
Roughly how many “very busy” days does this spot see each year? - not being a Pismo/Shell Beach "local," i'd guess 50-60
How many people are on the beach at the peak time on a “medium attendance” day? - 30-50
How many surfers are in the water on a "medium attendance" day? - 5-10
Roughly how many “medium attendance” days does this spot see each year? - guessing again at 75-100
How many people are on the beach at the peak time on a “slow” day? - 10-20
How many surfers are in the water on a "slow" day? - 0-5
Roughly how many “slow” days does this spot see each year? - 40 +/-

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - very rarely

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - very rarely

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - no beach use, but use park for grandkids.

How frequently do you visit? - 8-10x/year

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - yes

How do you access the beach? - trails and access stairs

How frequently do you visit? - 10-15x/year

How many people are on the beach at the peak time on a “very busy” day? - 30-40 in the nearby area (2 block "radius")

How many surfers are in the water at peak time on a "very busy" day? - 10-12

Roughly how many “very busy” days does this spot see each year? - 20-25

How many people are on the beach at the peak time on a “medium attendance” day? - 20-25 in the nearby area (2 block "radius")

How many surfers are in the water on a "medium attendance" day? - 5-7

Roughly how many “medium attendance” days does this spot see each year? - 40-50

How many people are on the beach at the peak time on a “slow” day? - 5-10 in the nearby area (2 block "radius")

How many surfers are in the water on a "slow" day? - 0-3

Roughly how many “slow” days does this spot see each year? - 30-40

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - M. Clair
Address: - 139 Wawona Ave.
City/Town: - Pismo Beach
State: - CA
ZIP: - 93449
Email Address: - [redacted]
Phone Number: - N/A

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).
Do you use this beach- yes or no? - Yes
How do you access the beach? - From Seacliff Drive.
How frequently do you visit? - 2-3 time per month
How many people are on the beach at the peak time on a “very busy” day? - 3
How many surfers are in the water at peak time on a "very busy" day? - 25
Roughly how many “very busy” days does this spot see each year? - 52
How many people are on the beach at the peak time on a “medium attendance” day? - 2
How many surfers are in the water on a "medium attendance" day? - 12
Roughly how many “medium attendance” days does this spot see each year? - 200
How many people are on the beach at the peak time on a “slow” day? - 1
How many surfers are in the water on a "slow" day? - 5
Roughly how many “slow” days does this spot see each year? – 113

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).
Do you use this beach- yes or no? - Yes
How do you access the beach? - On foot
How frequently do you visit? - 2-3 times per week.
How many people are on the beach at the peak time on a “very busy” day? - 15
How many surfers are in the water at peak time on a "very busy" day? - 4
Roughly how many “very busy” days does this spot see each year? - 52
How many people are on the beach at the peak time on a “medium attendance” day? - 10
How many surfers are in the water on a "medium attendance" day? - 2
Roughly how many “medium attendance” days does this spot see each year? - 200

How many people are on the beach at the peak time on a “slow” day? - 5

How many surfers are in the water on a "slow" day? - 0

Roughly how many “slow” days does this spot see each year? – 113

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - Yes

How do you access the beach? - On foot

How frequently do you visit? - 2-3 days per week (I live on Wawona)

How many people are on the beach at the peak time on a “very busy” day? - 4 on the beach, 20 on the bluff

How many surfers are in the water at peak time on a "very busy" day? - 0

Roughly how many “very busy” days does this spot see each year? - 52

How many people are on the beach at the peak time on a “medium attendance” day? - 3 on the beach, 13 on the bluff

How many surfers are in the water on a "medium attendance" day? - 0

Roughly how many “medium attendance” days does this spot see each year? - 200

How many people are on the beach at the peak time on a “slow” day? - 2 on the beach, 8 on the bluff

How many surfers are in the water on a "slow" day? - 0

Roughly how many “slow” days does this spot see each year? - 100

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Beautiful beach, a sea wall would take a lot away from what makes it attractive and great.

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - Yes.

How frequently do you visit? - Rarely.

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - No.

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - Yes

How do you access the beach? - Stairs.

How frequently do you visit? - 2 times per month

How many people are on the beach at the peak time on a “very busy” day? - 150 or more
How many surfers are in the water at peak time on a "very busy" day? - 60
Roughly how many “very busy” days does this spot see each year? - 120
How many people are on the beach at the peak time on a “medium attendance” day? - 100
How many surfers are in the water on a "medium attendance" day? - 45
Roughly how many “medium attendance” days does this spot see each year? - 180
How many people are on the beach at the peak time on a “slow” day? - 65
How many surfers are in the water on a "slow" day? - 20
Roughly how many “slow” days does this spot see each year? - 65
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - This is a high-traffic beach for it's breadth, beauty, and fine sand.

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Greg Nims
Address: - 922 Countrywood Crt.
City/Town: - Santa Maria
State: - CA
ZIP: - 93455
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - No

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - Yes
How do you access the beach? - The stairs at the end of Vista Del Mar
How frequently do you visit? - Monthly

How many people are on the beach at the peak time on a “very busy” day? - 15 to 30
How many surfers are in the water at peak time on a "very busy" day? - N/A
Roughly how many “very busy” days does this spot see each year? - Not sure
How many people are on the beach at the peak time on a “medium attendance” day? - 10 to 20
How many surfers are in the water on a "medium attendance" day? - N/A
Roughly how many “medium attendance” days does this spot see each year? - Not sure
How many people are on the beach at the peak time on a “slow” day? - 5 to 15
How many surfers are in the water on a "slow" day? - N/A
Roughly how many “slow” days does this spot see each year? - Not sure
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Our family enjoys tide-pooling w. our grand-children ...

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).
Do you use this beach- yes or no? - Ocassionally

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
Do you use this beach- yes or no? - No

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
Do you use this beach- yes or no? - No

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
Do you use this beach- yes or no? - No

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1. Please provide contact information to verify the information you will provide on beach use.
Name: - Carol Georgi
Address: - 243 Vista del Mar
City/Town: - Pismo Beach
State: - CA
ZIP: - 93449
Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - My son and grandson use this beach
How do you access the beach? - trail
How frequently do you visit? - 4 times per month
How many people are on the beach at the peak time on a “very busy” day? - 15
How many surfers are in the water at peak time on a "very busy" day? - 24
Roughly how many “very busy” days does this spot see each year? - 100 or more
How many people are on the beach at the peak time on a “medium attendance” day? - 8
How many surfers are in the water on a "medium attendance" day? - 15
Roughly how many “medium attendance” days does this spot see each year? - 50
How many people are on the beach at the peak time on a “slow” day? - 2
How many surfers are in the water on a "slow" day? - 4
Roughly how many “slow” days does this spot see each year? - 30
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - some take dogs to the beach down the trail, many walk and tidepools

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - yes
How do you access the beach? - stairs
How frequently do you visit? - every other day
How many people are on the beach at the peak time on a “very busy” day? - 60
How many surfers are in the water at peak time on a "very busy" day? - 10
Roughly how many “very busy” days does this spot see each year? - 100
How many people are on the beach at the peak time on a “medium attendance” day? - 25
How many surfers are in the water on a "medium attendance" day? - 10
Roughly how many “medium attendance” days does this spot see each year? - 60
How many people are on the beach at the peak time on a “slow” day? - 12
How many surfers are in the water on a "slow" day? - 8
Roughly how many “slow” days does this spot see each year? - 30

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - planned seawall will cause erosion behind stairs and bring damage to tidepools

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no, but I watch many use this beach for tidepooling

How do you access the beach? - they walk down trails

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - no, but I have seen many use this beach

How do you access the beach? - their are stairs provided and walkways

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - no

How do you access the beach? - this beach has complete easy access and is part of the main Pismo Beach

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Michael Phares

Address: - 891 S. 9th St.

City/Town: - Grover Beach

State: - CA

ZIP: - 93433

Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes
How do you access the beach? - St Anne's park - cliff trail down from park
How frequently do you visit? - during winter (Nov-Mar) - 3-4 times per month
How many people are on the beach at the peak time on a “very busy” day? - 0
How many surfers are in the water at peak time on a "very busy" day? - 50-75
Roughly how many “very busy” days does this spot see each year? - 25-30
How many people are on the beach at the peak time on a “medium attendance” day? - 0
How many surfers are in the water on a "medium attendance" day? - 30-50
Roughly how many “medium attendance” days does this spot see each year? - 10-20
How many people are on the beach at the peak time on a “slow” day? - 0
How many surfers are in the water on a "slow" day? - 5-10
Roughly how many “slow” days does this spot see each year? - 300+

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - no
How do you access the beach? - n/a
How frequently do you visit? - n/a
How many people are on the beach at the peak time on a “very busy” day? - n/a
How many surfers are in the water at peak time on a "very busy" day? - n/a
Roughly how many “very busy” days does this spot see each year? - n/a
How many people are on the beach at the peak time on a “medium attendance” day? - n/a
How many surfers are in the water on a "medium attendance" day? - n/a
Roughly how many “medium attendance” days does this spot see each year? - n/a
How many people are on the beach at the peak time on a “slow” day? - n/a
How many surfers are in the water on a "slow" day? - n/a
Roughly how many “slow” days does this spot see each year? - n/a

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - yes
How do you access the beach? - cliff trail
How frequently do you visit? - during winter (Nov-Mar) - 3-4 times per month
How many people are on the beach at the peak time on a “very busy” day? - 10-15

How many surfers are in the water at peak time on a "very busy" day? - 40-50
Roughly how many “very busy” days does this spot see each year? - 25-30
How many people are on the beach at the peak time on a “medium attendance” day? - 5-10
How many surfers are in the water on a "medium attendance" day? - 25-40
Roughly how many “medium attendance” days does this spot see each year? - 10-20
How many people are on the beach at the peak time on a “slow” day? - 0-5
How many surfers are in the water on a "slow" day? - 5-10
Roughly how many “slow” days does this spot see each year? - 300+

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
Do you use this beach- yes or no? - no
How do you access the beach? - n/a
How frequently do you visit? - n/a
How many people are on the beach at the peak time on a “very busy” day? - n/a
How many surfers are in the water at peak time on a "very busy" day? - n/a
Roughly how many “very busy” days does this spot see each year? - n/a
How many people are on the beach at the peak time on a “medium attendance” day? - n/a
How many surfers are in the water on a "medium attendance" day? - n/a
Roughly how many “medium attendance” days does this spot see each year? - n/a
How many people are on the beach at the peak time on a “slow” day? - n/a
How many surfers are in the water on a "slow" day? - n/a
Roughly how many “slow” days does this spot see each year? - n/a

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
Do you use this beach- yes or no? - no
How do you access the beach? - n/a
How frequently do you visit? - n/a
How many people are on the beach at the peak time on a “very busy” day? - n/a
How many surfers are in the water at peak time on a "very busy" day? - n/a
Roughly how many “very busy” days does this spot see each year? - n/a
How many people are on the beach at the peak time on a “medium attendance” day? - n/a
How many surfers are in the water on a "medium attendance" day? - n/a
Roughly how many “medium attendance” days does this spot see each year? - n/a
How many people are on the beach at the peak time on a “slow” day? - n/a

How many surfers are in the water on a "slow" day? - n/a
Roughly how many “slow” days does this spot see each year? - n/a

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
Do you use this beach- yes or no? - yes
How do you access the beach? - Wadsworth stairs or Wilmar stairs
How frequently do you visit? - 80-90 days per year
How many people are on the beach at the peak time on a “very busy” day? - 200-250
How many surfers are in the water at peak time on a "very busy" day? - 75-100
Roughly how many “very busy” days does this spot see each year? - 40-50
How many people are on the beach at the peak time on a “medium attendance” day? - 100
How many surfers are in the water on a "medium attendance" day? - 50-75
Roughly how many “medium attendance” days does this spot see each year? - 40-50
How many people are on the beach at the peak time on a “slow” day? - 25
How many surfers are in the water on a "slow" day? - 10-20
Roughly how many “slow” days does this spot see each year? - 300+

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1. Please provide contact information to verify the information you will provide on beach use.
Name: - Troy Smith
Address: - 350 Ramona Ave
City/Town: - Grover Beach
State: - CA
ZIP: - 93433
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).
Do you use this beach- yes or no? - Yes
How do you access the beach? - Down 1 of 2 paths from Spyglass park or Memory park
How frequently do you visit? - Approximately twice per month, sometimes more

How many people are on the beach at the peak time on a “very busy” day? - 40
How many surfers are in the water at peak time on a "very busy" day? - 20
Roughly how many “very busy” days does this spot see each year? - 5-10
How many people are on the beach at the peak time on a “medium attendance” day? - 20
How many surfers are in the water on a "medium attendance" day? - 10
Roughly how many “medium attendance” days does this spot see each year? - 10 - 20
How many people are on the beach at the peak time on a “slow” day? - 5
How many surfers are in the water on a "slow" day? - 2
Roughly how many “slow” days does this spot see each year? - 20-40
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Resident sea otter, grebe, octopus populations

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).
Do you use this beach- yes or no? - No

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).
Do you use this beach- yes or no? - No

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
Do you use this beach- yes or no? - No

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
Do you use this beach- yes or no? - No

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
Do you use this beach- yes or no? - No

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1. Please provide contact information to verify the information you will provide on beach use.
Name: - joey racano
Address: - 1487 nipomo ave

City/Town: - Los Osos
State: - CA
ZIP: - 93402
Email Address: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).
Do you use this beach- yes or no? - yes
How do you access the beach? - any way I can
How frequently do you visit? - 2 a week
How many people are on the beach at the peak time on a “very busy” day? - 50
How many surfers are in the water at peak time on a "very busy" day? - 40
Roughly how many “very busy” days does this spot see each year? - 90
How many people are on the beach at the peak time on a “medium attendance” day? - 30
How many surfers are in the water on a "medium attendance" day? - 20
Roughly how many “medium attendance” days does this spot see each year? - 200
How many people are on the beach at the peak time on a “slow” day? - 5
How many surfers are in the water on a "slow" day? - 5
Roughly how many “slow” days does this spot see each year? - 20
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Its very natural and should stay that way

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).
No Response

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).
No Response

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
No Response

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

No Response

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

No Response

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - George D'Entremont
Address: - 1815 Portola Street
City/Town: - San Luis Obispo
State: - CA
ZIP: - 93405
Email Address: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - Yes
How do you access the beach? - Down cliff at Spyglass Park
How frequently do you visit? - Approx 6 times/month
How many people are on the beach at the peak time on a “very busy” day? - 20
How many surfers are in the water at peak time on a "very busy" day? - 60
Roughly how many “very busy” days does this spot see each year? - 600
How many people are on the beach at the peak time on a “medium attendance” day? - 10
How many surfers are in the water on a "medium attendance" day? - 30
Roughly how many “medium attendance” days does this spot see each year? - 80
How many people are on the beach at the peak time on a “slow” day? - 0
How many surfers are in the water on a "slow" day? - 0
Roughly how many “slow” days does this spot see each year? – 80

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

No Response

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).
No Response

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
No Response

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
No Response

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
No Response

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1. Please provide contact information to verify the information you will provide on beach use.
Name: - jeff bonner
Address: - 652 caudill st
City/Town: - san luis obispo
State: - CA
ZIP: - 93401
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).
Do you use this beach- yes or no? - yes
How do you access the beach? - access from spyglass park and the park at the end of baker street
How frequently do you visit? - 10-12 times per year
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How many people are on the beach at the peak time on a “very busy” day? - 15
How many surfers are in the water at peak time on a "very busy" day? - 40
Roughly how many “very busy” days does this spot see each year? - 10-12
How many people are on the beach at the peak time on a “medium attendance” day? - 6-10
How many surfers are in the water on a "medium attendance" day? - 20
Roughly how many “medium attendance” days does this spot see each year? - 10+
How many people are on the beach at the peak time on a “slow” day? - 6
How many surfers are in the water on a "slow" day? - 3-7
Roughly how many “slow” days does this spot see each year? - 10-20
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - this is a premier surf location on the central coast. Natural and beautiful

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).
Do you use this beach- yes or no? - No

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).
Do you use this beach- yes or no? - No

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).
Do you use this beach- yes or no? - No

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).
Do you use this beach- yes or no? - No

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).
Do you use this beach- yes or no? - No

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1. Please provide contact information to verify the information you will provide on beach use.
Name: - david georgi

Address: - 243 Vista Del Mar
City/Town: - Shell Beach
State: - CA
ZIP: - 93449
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?
[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).
Do you use this beach- yes or no? - yes
How do you access the beach? - on trail down bluffs
How frequently do you visit? - weekly
How many people are on the beach at the peak time on a “very busy” day? - more than 50
How many surfers are in the water at peak time on a "very busy" day? - dozens
Roughly how many “very busy” days does this spot see each year? - 50-100
How many people are on the beach at the peak time on a “medium attendance” day? - 20 or 30
How many surfers are in the water on a "medium attendance" day? - 20
Roughly how many “medium attendance” days does this spot see each year? - 50-100
How many people are on the beach at the peak time on a “slow” day? - 5
How many surfers are in the water on a "slow" day? - 2
Roughly how many “slow” days does this spot see each year? - 50-100
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - excellent wave break

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).
Do you use this beach- yes or no? - yes
How do you access the beach? - stairs
How frequently do you visit? - several times a week
How many people are on the beach at the peak time on a “very busy” day? - 50-100
How many surfers are in the water at peak time on a "very busy" day? - 10-20
Roughly how many “very busy” days does this spot see each year? - 50-100

How many people are on the beach at the peak time on a “medium attendance” day? - 40-60
How many surfers are in the water on a "medium attendance" day? - 5-10
Roughly how many “medium attendance” days does this spot see each year? - 50-100
How many people are on the beach at the peak time on a “slow” day? - 5-10
How many surfers are in the water on a "slow" day? - 1-4
Roughly how many “slow” days does this spot see each year? - 50-100
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - many more kayakers use it than surfers

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - yes
How do you access the beach? - climb bluff
How frequently do you visit? - weekly
How many people are on the beach at the peak time on a “very busy” day? - 5-10
How many surfers are in the water at peak time on a "very busy" day? - not a surf spot
Roughly how many “very busy” days does this spot see each year? - 40-60
How many people are on the beach at the peak time on a “medium attendance” day? - 1-5
How many surfers are in the water on a "medium attendance" day? - na
Roughly how many “medium attendance” days does this spot see each year? - 40-60
How many people are on the beach at the peak time on a “slow” day? - 0-1
How many surfers are in the water on a "slow" day? - na
Roughly how many “slow” days does this spot see each year? - more than 100
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - gull rookery and kayak area

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - seldom
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - kayakers and some divers

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - seldom
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) – kayakers

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - seldom

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - kayakers

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Jerry Damron

Address: - 791 Price Street #210

City/Town: - Pismo Beach

State: - CA

ZIP: - 93449

Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - Yes

How do you access the beach? - Walk down the pathway

How frequently do you visit? - 10 times a year

How many people are on the beach at the peak time on a “very busy” day? - 75+

How many surfers are in the water at peak time on a "very busy" day? - 50

Roughly how many “very busy” days does this spot see each year? - 200

How many people are on the beach at the peak time on a “medium attendance” day? - 10

How many surfers are in the water on a "medium attendance" day? - 5

Roughly how many “medium attendance” days does this spot see each year? - 100

How many people are on the beach at the peak time on a “slow” day? - 10

How many surfers are in the water on a "slow" day? - 5

Roughly how many “slow” days does this spot see each year? - 165

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - It is difficult to access.

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - No

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - No

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - Yes
How do you access the beach? - Walk up the beach from the pier
How frequently do you visit? - 2-3 times per week
How many people are on the beach at the peak time on a “very busy” day? - 250
How many surfers are in the water at peak time on a "very busy" day? - 150
Roughly how many “very busy” days does this spot see each year? - 200
How many people are on the beach at the peak time on a “medium attendance” day? - 25
How many surfers are in the water on a "medium attendance" day? - 25
Roughly how many “medium attendance” days does this spot see each year? - 150
How many people are on the beach at the peak time on a “slow” day? - 50
How many surfers are in the water on a "slow" day? - 15
Roughly how many “slow” days does this spot see each year? – 165

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - Yes
How do you access the beach? - Walk up the beach
How frequently do you visit? - 2+ times per week
How many people are on the beach at the peak time on a “very busy” day? - 200
How many surfers are in the water at peak time on a "very busy" day? - 100
Roughly how many “very busy” days does this spot see each year? - 100
How many people are on the beach at the peak time on a “medium attendance” day? - 20
How many surfers are in the water on a "medium attendance" day? - 20
Roughly how many “medium attendance” days does this spot see each year? - 100
How many people are on the beach at the peak time on a “slow” day? - 50
How many surfers are in the water on a "slow" day? - 10
Roughly how many “slow” days does this spot see each year? – 165

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - No

1. Please provide contact information to verify the information you will provide on beach use.

Name: - Tim Page
Address: - 129 Baker
City/Town: - Shell Beach
State: - CA
ZIP: - 93449
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - Yes
How do you access the beach? - Climb down cliff
How frequently do you visit? - monthly
How many people are on the beach at the peak time on a “very busy” day? - 18
How many surfers are in the water at peak time on a "very busy" day? - 35
Roughly how many “very busy” days does this spot see each year? - 20
How many people are on the beach at the peak time on a “medium attendance” day? - 5
How many surfers are in the water on a "medium attendance" day? - 15
Roughly how many “medium attendance” days does this spot see each year? - 40
How many people are on the beach at the peak time on a “slow” day? - 2
How many surfers are in the water on a "slow" day? - 6
Roughly how many “slow” days does this spot see each year? - 70
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - It is difficult to access, but worth it

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in

Shell Beach).

Do you use this beach- yes or no? - no

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - no

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - no

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - no

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Jim DeCecco

Address: - 140 Vista Del Mar

City/Town: - Pismo Beach

State: - CA

ZIP: - 93449

Email Address: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes

How do you access the beach? - Down the trail at St Anns park

How frequently do you visit? - 2 a week during the winter months

How many people are on the beach at the peak time on a “very busy” day? - during the summer about 50

How many surfers are in the water at peak time on a "very busy" day? - 20 to 25

Roughly how many “very busy” days does this spot see each year? - During the winter about, on a good swell about 3 times a week

How many people are on the beach at the peak time on a “medium attendance” day? - 20 to 30

How many surfers are in the water on a "medium attendance" day? - 15 to 20 at one time but at least 100 total one any given day

Roughly how many “medium attendance” days does this spot see each year? - at least 100

How many people are on the beach at the peak time on a “slow” day? - 20 to 30

How many surfers are in the water on a "slow" day? - 5 to 10

Roughly how many “slow” days does this spot see each year? - any time it rains is a slow day

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - St Anns is one of the most heavily used breaks in the area

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

No Response

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

No Response

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

No Response

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

No Response

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

No Response

1. Please provide contact information to verify the information you will provide on beach use.

Name: - Thomas Ortiz
Address: - 145 San Jose Court
City/Town: - San Luis Obispo
State: - CA
ZIP: - 93405
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes
How do you access the beach? - car/parking lot/cliff trails
How frequently do you visit? - 2-3 times weekly
How many people are on the beach at the peak time on a “very busy” day? - 100+
How many surfers are in the water at peak time on a "very busy" day? - 60+
Roughly how many “very busy” days does this spot see each year? - 60
How many people are on the beach at the peak time on a “medium attendance” day? - 50
How many surfers are in the water on a "medium attendance" day? - 30
Roughly how many “medium attendance” days does this spot see each year? - 150
How many people are on the beach at the peak time on a “slow” day? - 25
How many surfers are in the water on a "slow" day? - 15
Roughly how many “slow” days does this spot see each year? - 150
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Adjacent parks

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - no

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - no

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - yes
How do you access the beach? - car/street parking/stairs
How frequently do you visit? - 2-3/month
How many people are on the beach at the peak time on a “very busy” day? - 200+
How many surfers are in the water at peak time on a "very busy" day? - 100+
Roughly how many “very busy” days does this spot see each year? - 100
How many people are on the beach at the peak time on a “medium attendance” day? - 100
How many surfers are in the water on a "medium attendance" day? - 50
Roughly how many “medium attendance” days does this spot see each year? - 160
How many people are on the beach at the peak time on a “slow” day? - 50
How many surfers are in the water on a "slow" day? - 25
Roughly how many “slow” days does this spot see each year? – 100

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - no

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1. Please provide contact information to verify the information you will provide on beach use.

Name: - Arthur deGoede
Address: - 1501 Strawberry Ave
City/Town: - Arroyo Grande
State: - CA
ZIP: - 93420
Email Address: - [redacted]
Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - yes

How do you access the beach? - climb down the cliff

How frequently do you visit? - During large swells

How many people are on the beach at the peak time on a “very busy” day? - 3

How many surfers are in the water at peak time on a "very busy" day? - 20 to 30

Roughly how many “very busy” days does this spot see each year? - few

How many people are on the beach at the peak time on a “medium attendance” day? - couple

How many surfers are in the water on a "medium attendance" day? - 10 to 20

Roughly how many “medium attendance” days does this spot see each year? - several

How many people are on the beach at the peak time on a “slow” day? - one

How many surfers are in the water on a "slow" day? - 5 to 10

Roughly how many “slow” days does this spot see each year? - many

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - slippery climb when wet

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - yes

How do you access the beach? - stairs

How frequently do you visit? - infrequent

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - good dog beach, kayak

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

Do you use this beach- yes or no? - no

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

Do you use this beach- yes or no? - yes

How do you access the beach? - path and stairs

How frequently do you visit? - 4 times a year

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - good dog beach

7. Please enter information pertaining to beach use at Price Street South (off Price Street immediately westward of the Best Western Shore Cliff Hotel).

Do you use this beach- yes or no? - no

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Stairway washed out, other wise good dog beach

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

Do you use this beach- yes or no? - yes

How do you access the beach? - stairs at Wadsworth

How frequently do you visit? - monthly

How many people are on the beach at the peak time on a “very busy” day? - many

How many surfers are in the water at peak time on a "very busy" day? - a whole lot

Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - surf, volleyball, dogs

---

1. Please provide contact information to verify the information you will provide on beach use.

Name: - David Rasmussen

Address: - 622 Wintergreen Lane

City/Town: - Walnut Creek

State: - CA

ZIP: - 94598

Email Address: - [redacted]

Phone Number: - [redacted]

2. May we follow up with you to keep you posted on opportunities to speak up and protect the Shell Beach/Pismo Beach area?

[redacted]

3. Please enter information pertaining to beach use between Baker Ave and Seacliff Drive in Shell Beach (St. Anns/Shaft area).

Do you use this beach- yes or no? - Yes

How do you access the beach? - Trail down the hillside

How frequently do you visit? - 1-3 times per week

How many people are on the beach at the peak time on a “very busy” day? - 50-60

How many surfers are in the water at peak time on a "very busy" day? - 30-40
Roughly how many “very busy” days does this spot see each year? - 60
How many people are on the beach at the peak time on a “medium attendance” day? - 30-40
How many surfers are in the water on a "medium attendance" day? - 20-30
Roughly how many “medium attendance” days does this spot see each year? - 120
How many people are on the beach at the peak time on a “slow” day? - 10-20
How many surfers are in the water on a "slow" day? - 10-20
Roughly how many “slow” days does this spot see each year? - 120
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - somewhat difficult to access beach, many tidepoolers visit the area

4. Please enter information pertaining to beach use at Vista Del Mar a.k.a. Shell Beach Boulders/Skag Drags (near the intersection of Vista Del Mar Ave and Ocean Boulevard in Shell Beach).

Do you use this beach- yes or no? - yes
How do you access the beach? - staircase
How frequently do you visit? - 1 time per 2 months
How many people are on the beach at the peak time on a “very busy” day? - 50
How many surfers are in the water at peak time on a "very busy" day? - 20
Roughly how many “very busy” days does this spot see each year? - 40
How many people are on the beach at the peak time on a “medium attendance” day? - 30
How many surfers are in the water on a "medium attendance" day? - 5-10
Roughly how many “medium attendance” days does this spot see each year? - 100
How many people are on the beach at the peak time on a “slow” day? - 10-20
How many surfers are in the water on a "slow" day? - 1-5
Roughly how many “slow” days does this spot see each year? - 160
Is there any other important information about this spot? (i.e. difficult to access, method of access, other prominent uses of the beach) - Many tidepoolers

5. Please enter information pertaining to beach use at Ocean Park a.k.a. Shell Beach Boulders (in front of Ocean Boulevard between Wawona Ave and Capistrano Ave in Shell Beach).

No Response

6. Please enter information pertaining to beach use at Price Street North (off Price Street between Dinosaur Caves Park and the Best Western Shelter Cove Lodge).

No Response

7. Please enter information pertaining to beach use at Price Street South (off Price Street

immediately westward of the Best Western Shore Cliff Hotel).

No Response

8. Please enter information pertaining to beach use at Pismo Beach at Cypress Street (at the foot of Harloe Ave).

No Response

Response to Comment 9-1:

Comment noted.

Response to Comment 9-2:

Comment noted.

Response to Comment 9-3:

Comment noted.

Response to Comment 9-4:

Comment noted.

Response to Comment 9-5:

The USACE has consulted with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Response to Comment 9-6:

The Initial study did consider impacts to uses and resources below the bluff tops. Those impacts and resources are discussed in Section 4 of the EA/MND.

Response to Comment 9-7:

Aesthetics, cumulative impacts, and recreation were analyzed in the EA/MND.

Response to Comment 9-8:

The Commenter is inaccurate in stating that since SLO County is nonattainment for PM_{10}, any additional PM_{10} could result in a significant impact. The theory that an increase of one molecule of an air pollutant constitutes a significant increase (one-molecule theory) should not be the basis of a de-facto significance threshold, as discussed in the decision for *Community for a Better Environment v. California Resources Agency* [103 Cal. App. 4th 98 (2002)], "this does not mean, however, that any additional effect in a nonattainment area for that effect necessarily creates a significant cumulative impact; the 'one [additional] molecule rule' is not the law."

Response to Comment 9-9:

Erosion of beaches fronting shoreline structures is generally attributable to toe scour effects from poorly designed seawalls, and not wave reflection. For the proposed Pismo Beach structures, the intent is to design the structure so as to preclude return water from scouring the beach, by embedding the structure toe into bedrock, providing an armor stone toe apron, and proper elevation of the structure crest to prevent/minimize overtopping. Monitoring of beaches in Santa Cruz County at sites with and without revetments and seawalls showed that the beach profile adjusts nearly identically in front of revetments compared to locations without revetments. Revetment did not cause measurable erosion in front of the structures. The erosion that was measured was from the effects of reflection of the ends of the walls that are angled to the wave approach. These flank/end effects are discussed below.

There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to "rip currents" at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered and, accordingly, the ends of the structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

Response to Comment 9-10:

Section 3.2 explains why other alternatives were not carried forward for further analysis. The proposed project is to protect the toe of the bluffs from wave erosion. Therefore, alternatives to only protect the top of the bluffs from erosion due to runoff did not meet the project purpose.

Response to Comment 9-11:

Because the area inland of the bluff tops is fully developed, there is no place to relocate utilities, parks, trails, and roads threatened by bluff top erosion.

Response to Comment 9-12:

Rock will not be placed on the beach outside the footprint of the structure. The EA/MND said the excavated "material" is to be placed on the beach; the excavated material in this statement is the beach sand material that would be dug out in the toe trench. This beach sand material would be used for backfilling the toe trench or placed seaward of the revetment or vertical wall. For further clarification, any debris material would be hauled away and any rock material would be re-used as part of the revetment structure or used for backfill as possible.

Response to Comment 9-13:

For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered and, accordingly, the ends of the structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

Response to Comment 9-14:

As discussed in previous response to comments, the structures have been designed so that they will not increase erosion in adjacent areas. There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to "rip currents" at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered and, accordingly, the ends of the

structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

Response to Comment 9-15:

The City of Pismo Beach has been unable to find any information on the existing bluff protection structures in the project area. The City believes they were installed prior to the 1970's and the need to get Coastal Development Permits.

Response to Comment 9-16:

The impact the Commenter is referring to is in Section 2.1.1 of the SLO County APCD CEQA Air Quality Handbook, where they discuss special conditions for construction activity. The document states that the "proximity of sensitive individuals (receptors) to a construction site constitutes a special condition and may require a more comprehensive evaluation of toxic diesel PM impacts and if deemed necessary by the SLO County APCD, more aggressive implementation of mitigation measures than described below in the diesel idling section." The 1,000 feet (not 100 feet, as the Commentor states) distance is required for staging and queuing areas and any diesel idling, not the vehicular traffic activity.

Response to Comment 9-17:

Erosion of beaches fronting shoreline structures is generally attributable to toe scour effects from poorly designed seawalls, and not wave reflection. For the proposed Pismo Beach seawalls, the intent is to design the structure so as to preclude return water from scouring the beach, by embedding the structure toe into bedrock, providing an armor stone toe apron, and proper elevation of the structure crest to prevent/minimize overtopping.

Also, as previously discussed, the loss of sediment supply from the bluffs by construction of the proposed structures would be minor. Fugro (2002) estimated that the ongoing erosion of the seacliffs contributed approximately 10,000 to 15,000 cubic yards of sediment to the shoreline each year, of which less than half is likely sand-sized or larger grain sizes that will actually deposit on the beaches. Another perspective is to look at the possible sediment contribution based on the total bluff face surface area being impacted by the proposed project. Using the St. Andrews location as an example, the impacted bluff area is 0.09 acres. If it is assumed that the bluff top retreat rate is on the order of 1 foot per year (conservative estimate), this equates to approximately 150 cubic yards of sediment that would be contributed annually to the beach by bluff erosion. Even if all of this sediment was beach quality sand, this would be a very small percentage of the total sand volume on the St. Andrews beach area.

Response to Comment 9-18:

The EA/MND quotes the California Climate Change Center (CCCC) mean rate of 3.2 to 4.6 feet from 2000 to 2100. The proposed project considered local relative sea level rise over the next 50 years (2010 to 2060) ranging from 0.51 to 1.75 feet, based on the methodology specified in USACE Circular EC 1165-2-211, "Water Resource Policies and Authorities: Incorporating Sea-Level Change Considerations in Civil Works Programs" which takes into account local land movement. The 1.75 feet by 2060 is reasonably consistent with the CCCC predictions.

Response to Comment 9-19:

Comment noted.

Response to Comment 9-20:

Comment noted.

Response to Comment 9-21:

The analysis in Section 4.7.2. acknowledges the impacts of the project to recreation but concludes they are insignificant. Under the No Action alternative there also would be impacts to recreation because the trail and parks along the bluff tops would be lost to erosion.

Response to Comment 9-22:

Thank you for your information about the high level of use of the informal trail at the St. Andrews Lift Station site. Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs

Response to Comment 9-23:

Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs

Response to Comment 9-24:

Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs

Response to Comment 9-25:

Under the existing condition there is very little beach at the St. Andrews Street site during high tides. With construction of the revetment the beach would still be accessible at low tides which is when most of the beach use occurs during the existing condition. Based on public input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The seawall alternative will minimize the loss of beach.

Response to Comment 9-26:

Comment noted.

Response to Comment 9-27:

As discussed in previous response to comments, the structures have been designed so that they will not increase erosion in adjacent areas. There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to “rip currents” at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking.

The rock revetment would not be placed at the immediate bottom of the stairwell, so there would still be the ability to reach the sandy beach at the bottom of the stairs. Based on a September 2009 survey, the beach at the seaward edge of the revetment is at approximately +4 feet MLLW, so beach access to the east of the stairs would require walking over the revetment rocks during the seasonal time periods when the revetment toe is not buried by sand.

Response to Comment 9-28:

Comment noted.

Response to Comment 9-29:

Comment noted.

Response to Comment 9-30:

The volleyball courts would be relocated when construction is finished. The revetment would be buried by sand.

Response to Comment 9-31

Impacts to the surface streets are analyzed in Section 4.11.2. The routes of construction traffic through these streets are shown and the number of trips per day as well as the total number of days that construction traffic will be on these streets is provided in the EA/MND.

Response to Comment 9-32

Comment noted.

Response to Comment 9-33

The proposed project at Cypress Street would protect the Cypress Street Lift Station as well as Cypress Street.

Comment Letter #10

Law Offices of Babak Naficy
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December 16, 2010

Via Electronic Mail and US Mail

Mr. Larry Smith (CESPL-PD-RQ)
Army Corps of Engineers
Los Angeles District
P.O. Box 532711
Los Angeles, California 90053-2325
lawrence.j.smith@usace.army.mil

City of Pismo
Planning Department
760 Mattie Road
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cjohnson@pismobeach.org
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RE: PISMO BEACH SHORELINE PROTECTION PROJECT ENVIRONMENTAL ASSESSMENT/ MITIGATED NEGATIVE DECLARATION

To whom it may concern,

Comment 10-1

Please accept these comments, which I submit on behalf of the Santa Lucia Chapter of the Sierra Club and the San Luis Obispo Coastkeepers in connection with the proposed Pismo Beach Shoreline Protection Proejct. As we explain more fully below, the Environmental Assessment/Mitigated Negative Declaration (EA/MND) are inadequate as a matter of law and therefore cannot be relied upon in connection with the approval of the proposed coastal armoring and seawall projects. Because the Project is capable of causing significant direct, indirect and cumulative impacts on the environment, the City and the Corps must prepare an Environmental Impact Statement and Environmental Impact Report (EIS/EIR). We also note that as proposed, the Project appears to be inconsistent with the policies of the California Coastal Act, including the policy in favor of maintaining and enhancing coastal access and coastal resources.

According to a report prepared by the Monterey Bay National Marine Sanctuary[1]:

Comment 10-2

> Environmental impacts of coastal armoring are both site specific and cumulative. The effects vary significantly depending on the type of structure constructed, the magnitude of the project, and the specific geological, biological, and oceanographic conditions in the vicinity of the structure. Thus the impacts of an individual project need to be evaluated on a case-by-case basis. Coastal armoring can potentially damage or alter local coastal habitats, deprive beaches of sand, lead to accelerated erosion of adjacent beaches, hinder access and present problems with public safety.

Background Information is incomplete and inadequate

The EA/MND describes the alleged "need" for the project in a single paragraph in section 1.3. The text of this paragraph is quoted below in its entirety:

Comment 10-3

> The six sites proposed for protection are suffering severe and accelerating erosion. At each of the sites, roadways, utilities, and/or parks and in some cases houses are threatened. Bluff protection in the past has consisted of a hodgepodge of emergency measures, such as revetments and seawalls that are unsightly and ineffective. The erosion also makes it difficult and unsafe for the public to access the shoreline. Bluff erosion is an ongoing dynamic process that will continue to impact the Pismo Bluffs. On-going retreat is likely to continue to encroach upon existing structures located above the seacliff, undermine coastal stairways and seawalls, and erode adjacent lands, reducing building setbacks. At these sites, increased erosion eventually will result in the loss of utilities, park space and roads, and the construction of stopgap emergency protective structures. For example, Price Street likely will be damaged by erosion within the next decade, and Highway 101 also is in jeopardy. Protection of the bluff toe is needed to keep the seacliffs at these sites from additional wave erosion.

The EA/MND is inadequate as a matter of law to the extent that it includes superficial and conclusory information. There is no information from which the public or the public decision-makers can determine the rate of erosion at each of the sites. With respect to Price Street, the EA/MND claims that Price Street will be damaged by erosion within the next decade, but what about the other sites? See, discussion of erosion at the St Andrews site below.

Comment 10-4

The EA/MND refers to "past" emergency measures that had been employed at each site, but does not describe these measures or explain, even briefly, the extent to which these past measures were effective in addressing concerns about coastal erosion or what impacts these measures had

[1] / A copy of this report can be found at http://montereybay.noaa.gov/resourcepro/resmanissues/coastal.html.

on coastal resources and coastal access. It would be important to know, for example, the extent to which the same type of "armoring" techniques proposed here had been used at these sites in the past, and to what effect.

Comment 10-5

Section 1.3 also hints that at least some of the individual projects will protect private property with public funds. This issue has to be clarified and the need for coastal armoring to address private property concerns must be disclosed and discussed. We question the propriety of expending public funds for protection of private property.

Comment 10-6

We also note repeated references to and reliance on "Moffat and Nichol, 2010", which appears to be a multi-facetted study relevant to the proposed project. Given the EA/MND's near complete reliance on this study, an adequate review is impossible unless we are provided with a copy of this study. Accordingly, we ask that you extend the review period and provide us with a copy of this study.

Analysis of Project Impacts is inadequate and incomplete

As we will explain in greater detail below, the EA/MND's analysis of Project impacts is incomplete and inadequate.

St. Andrews Lift Station:

Comment 10-7

A number of observers have commented that, contrary to assertions of the EA/MND, the St. Andrews' Lift Station is not subject to extensive erosion, as the base of the cliffs are made up of hard rock. Immediately adjacent to the proposed revetment site, existing armoring appears to adequately protect the cliff. To the extent that the face of these bluffs are eroding, that erosion is likely the result of stormwater sweeping down over the edge of the cliff. Accordingly, we seriously question the EA/MND's claim that rapid rates of erosion caused by ocean water requires armoring, or that armoring would address the existing erosion. The EA/MND must be revised to address this issue and provide adequate explanation and justification for the proposed action.

Comment 10-8

Moreover, the EA/MND claims that the proposed revetment at St. Andrews Lift Station would not "render a known mineral resource inaccessible." The beach and the rocks at the base of the cliffs at this location are accessible to the public, including beach-combers and surfers who visit and recreate at the site on a daily basis. The assertion that a revetment at this location would not affect the public's access, therefore, is without basis. The EA/MND itself acknowledges that there is public use of this beach, but dismisses this use for reasons that are not clearly explained. Accordingly, we reject the assertion that the proposed project would not affect public access at this location. It will.

Comment 10-9

We also question the EA/MND's analysis of biological impacts, particularly impacts to the intertidal rocky zone which will likely be significantly affected.

The EA underestimates the impact of sea-level rise that will result from climate change

Comment 10-10

The EA/MND claims that the six proposed armoring projects have been adequately sized to account for the expected sea level rise that will likely result from climate change. According to the EA, the sea level rise in the project area will be between 1.0 to 1.4 meters, 3.2 to 4.6 feet by 2100. EA/MND page 87. Yet, in analyzing the project, the EA/MND inexplicably asserts that "[t]he low range of the projected sea level rise is 0.51 feet in 50 years, the intermediate rate is 1.13 feet, and the high rate is 1.75 feet." Ibid. The logical assumption would be that expect sea level rise by that the range of sea level rise 50 years after the project is implemented (i.e. 2062) would be closer to the 1.6 to 2.3 feet. The EA/MND therefore clearly underestimates the potential significance of sea level rise on the project sites. The EA/MND must be revised to either correct or adequately explain these assumptions.

Comment 10-11

We also note that according to the Pacific Institute's 2009 "California Coastal Erosion Response to Sea Level Rise - Analysis and Mapping", by 2100, San Luis Obispo cliffs will recede on average a distance of 78 meters, up to a distance of 280 meters. As this report illustrates, sea level rise alone is not a good barometer of assessing the likely rate of coastal erosion. Other factors, such as geological features, slope, size, direction and frequency of waives etc. Because the EA/MND does not include any calculations it is impossible to access the degree to which these additional factors were considered.

Comment 10-12

Based on the foregoing, we cannot determine whether the proposed project adequately protective of coastal resources in the long run. As we have explained, it appears that the Corps has seriously underestimated the expected sea level rise in this area. Moreover, no justification has been provided for assuming a 50 year project life, and not a longer life such as 100 years. Finally, the EA fails to analyze the potential impacts of very large storm events (say, a 500 year event), and the extent to which the proposed projects can adequately withstand an event of such magnitude.

The EA/MND fails to adequately consider the Project's cumulative impacts.

"[A]n agency is required to consider more than one action in a single EIS if they are 'connected actions,' 'cumulative actions,' or 'similar actions.'" Kleppe v. Sierra Club, 427 U.S. 390, 408 (1976). The federal courts use a "but for" or "independent utility" test for connected actions. Thomas v. Peterson, 753 F. 2d 754, 758-60 (9th Cir. 1985). Likewise, CEQA requires analysis of cumulative impacts.

Comment 10-13

Here, the EA/MND fails to adequately consider the cumulative impact of the six proposed projects. Moreover, the EA/MND fails to consider the cumulative impact of the project in addition to the existing armoring that has already been built in the City of Pismo Beach and surrounding areas. Much of the St. Andrews Lift Station area, for example, has already been armored with sea walls and concrete sand bags. The EA/MND fails to consider the cumulative impact of the proposed revetment in addition to existing armoring both on the rate of sand accretion and erosion in nearby beaches and cliffs.

Inadequate Alternatives Analysis

Comment 10-14

The EA/MND fails to consider all feasible alternatives. In particular, the document fails to consider whether instead of armoring the shoreline, a better alternative would be to move the lift stations and other public facilities further inland. Given the EA/MND's failure to adequately predict the impact of sea level rise on the project site, this option must be seriously considered after the analysis of potential impact of sea level rise has been adequately revised.

Full EIR/EIS must be prepared

Comment 10-15

As these comments demonstrate, these related projects are clearly capable of significantly affecting the environment. Moreover, the project is clearly controversial to the extent that a number of experts and government agencies including the California Coastal Commission are concerned about the projects' potentially significant impacts. The public is concerned that the proposed projects will result in a significant adverse impact on the geology of the coast line, on natural and biological resources, and public access.

Comment 10-16

The presence of a genuine public controversy mandates the preparation of an EIS. Once the existence of a public controversy has been established by the critics of a project, the burden of proof shifts to the federal agency to provide a "convincing" explanation why no controversy exists. Foundation for North American Wild Sheep v. United States Dept. of Agriculture 681 F.2d 1172 (9th Cir. 1982); see also, Anderson v. Evans 371 F.3d 475 (9th Cir. 2004).

Conclusion

Comment 10-17

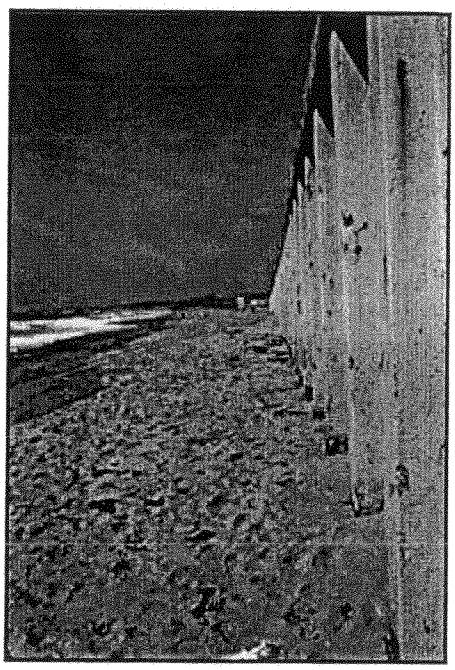
As we have explained, this Draft EA/MND is deeply flawed and inadequate as a matter of law. Moreover, owing to the potentially significant environmental impact that could result from the implementation of this project, and the existing public controversy, the relatively superficial analysis that is provided in an EA/MND will not suffice in this instance. The more detailed and thorough analysis that is needed here can only be accomplished with the preparation of an EIR/EIS.

Respectfully submitted

Babak Naficy

Encl.

Resource Management Issues: *Coastal Armoring*



Introduction

About 85% of the California coast experiences active erosion due to natural, and anthropogenic causes. Storm damage continually erodes away at the coastline, most notably during El Niño years such as the 1982-83 episode, and other heavy storms[1]. This ongoing erosion, which is largely a natural occurrence, presents a threat to coastal development that has occurred in areas vulnerable to these processes. Hard surfaces, such as concrete, cover large portions of land, impede the natural absorption of water, and thus exacerbate surficial erosion on adjacent unprotected land. Furthermore, in some areas, natural sand transport to the coast has been decreased through the damming of streams and rivers. Increases in coastal development also have led to storm-related damage[2]. A 1992 study by Griggs, Pepper and Jordan estimated that the cost of storm related damage and erosion, as well as structures used to mitigate the destruction throughout the state of California, averaged $100 million annually[3].

Shoreline protective structures have been used extensively along California's 1,200 mile coastline to protect infrastructure and other development from wave action, or to retain soil to avoid erosion. Shoreline protective structures have typically been installed by private landowners, local, state, or federal governments, in an attempt to protect development threatened by erosion. Structures have also been installed in response to the need to protect public infrastructure such as Highway 1, which in some stretches, is vulnerable to erosion related to bluff retreat. This practice is commonly known as coastal armoring, and seawalls, bulkheads and revetments are some of the structures used for coastal armoring. *Seawalls* are barriers, usually vertical walls, between the land and water that protect from wave erosion. A *bulkhead* is used as a retainer, providing protection and stabilizing the land that it supports. *Revetments* are protective structures placed along slopes and are constructed of a sturdy material such as stone[4]. With increases in development and continued natural erosion of coastal bluffs, additional pressures will come to install structures both to access the coast and to protect private and public property from erosion.

Wildlife Disturbance

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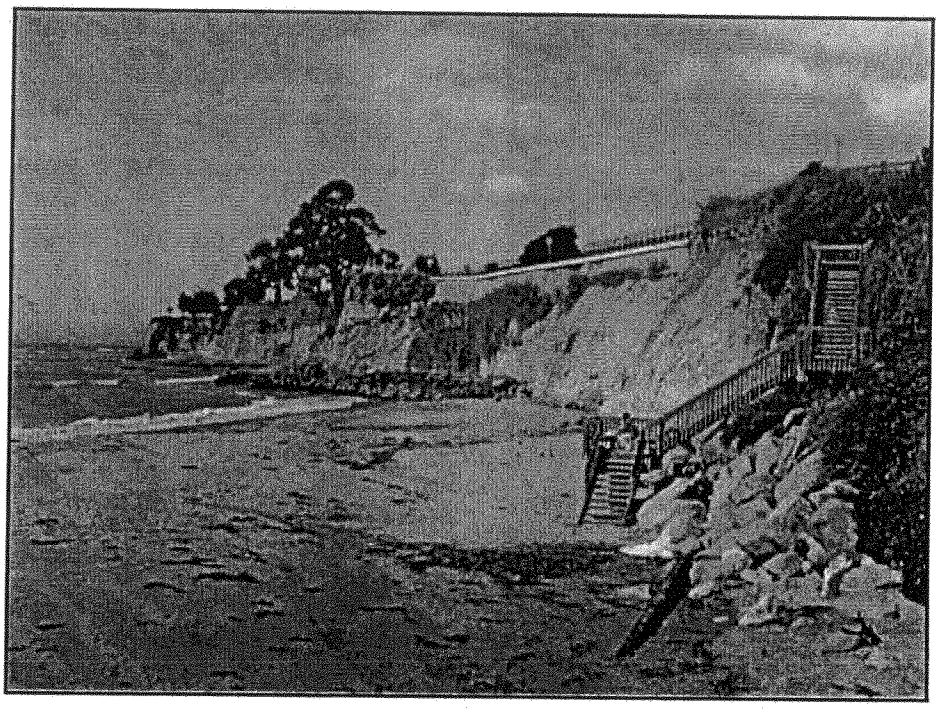
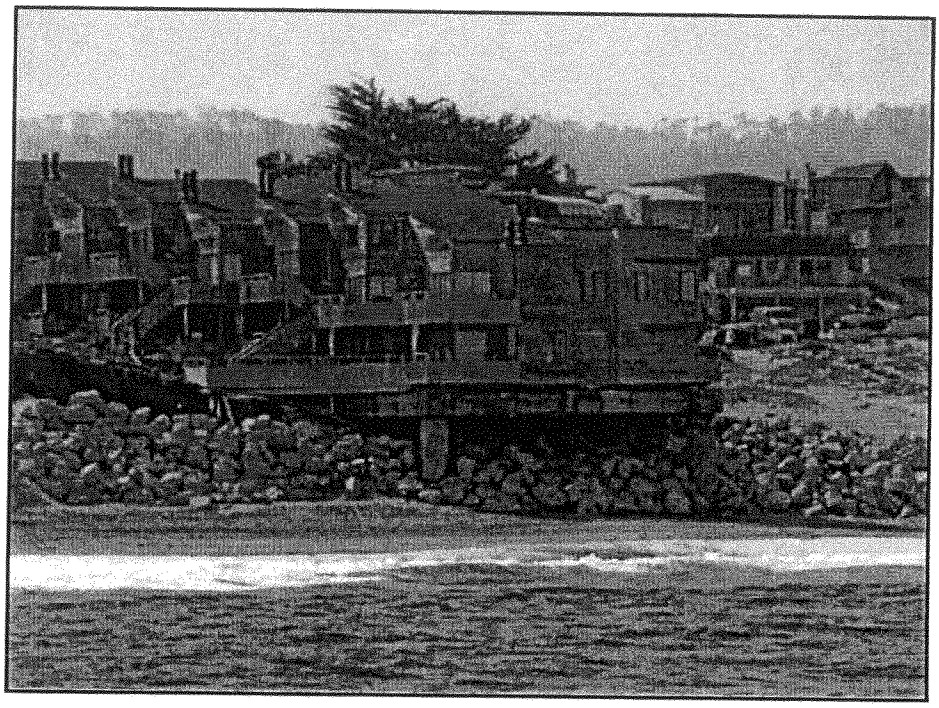


The Army Corps of Engineers conducted an assessment of coastal armoring in 1971, and found that 3 miles of the coastline between the Santa Cruz/San Mateo County border (all in the City of Santa Cruz), and Point Lobos in Monterey County was armored. By 1978 armoring had increased to 9.6 miles, and by 1993, armoring had increased to 12 miles. A 1995 report of the California Coastal Commission (Commission) estimated that if trends continue, there would be as much as 27.7 miles of coastal armoring in the same area, in the future. The report stated that although only one-eighth of the study area was armored in 1995, one-third of the coastline has the potential to warrant future protection when considering land use patterns and physical characteristics[5].

The trends in Santa Cruz and Monterey Counties are typical of the state. By 1998, coastal armoring had been installed to protect about twelve percent (or almost one-eighth) of the coastline statewide. The mid and late 1980's was a period when a large amount of shoreline armoring was installed – in response to the 1982/83 El Niño and the major storms that occurred in 1986 and 1988. Between 1985 and 1990, forty-five miles of armoring was installed, costing an average of $1,500 per foot ($60 million/year). By 1998, California residents were paying more than $75 million per year to armor the shoreline[6]. In a study conducted by Griggs et al., in 1992, it was determined that ocean front development has occurred in California in the face of a large amount of scientific and empirical evidence regarding the risks of erosion. Griggs et al. also concluded that there was a large degree of inconsistency among existing state and local policies in addressing coastal hazards, and furthermore that there was a significant economic and local political influence shaping these policies[7].

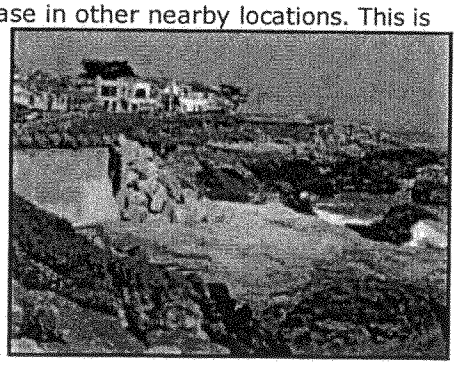
Development occurrs in vulnerable areas along California's coast, and is followed by a desire to protect both private/public property and infrastructure. The situation presents a serious predicament to both resource managers and property owners. However, it is clear that current policies need strengthening, and there is a need to develop collaborative approaches to address the issues of erosion and the demand for coastal armoring, including improved guidance to enable better decision-making.



Impacts of Coastal Armoring

Environmental impacts of coastal armoring are both site specific and cumulative. The effects vary significantly depending on the type of structure constructed, the magnitude of the project, and the specific geological, biological, and oceanographic conditions in the vicinity of the structure. Thus the impacts of an individual project need to be evaluated on a case-by-case basis. Coastal armoring can potentially damage or alter local coastal habitats, deprive beaches of sand, lead to accelerated erosion of adjacent beaches, hinder access and present problems with public safety.

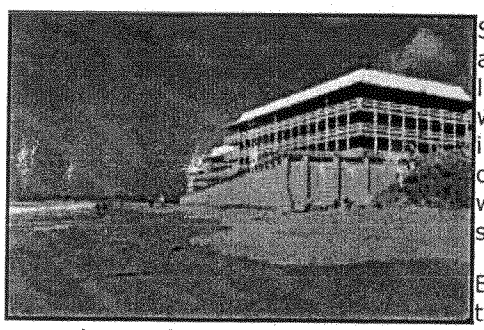
As with any activity that alters natural processes, there can be significant long-term impacts related to coastal armoring. Currents, waves, and wind normally transport sediment throughout the littoral system. Armoring of the coast can interfere with littoral transport, which in a natural state may reach a dynamic equilibrium. When the availability of sediment is reduced due to the existence of a structure, erosion can increase in other nearby locations. This is due to starvation of the materials that would normally supply these areas. When a structure is constructed, a supply of sediment is effectively being cut off. Armoring also causes deflection of wave energy, which can accelerate erosion of nearby sites, expanding the need for shoreline armoring structures. In some cases, installing coastal armoring begets more coastal armoring. Furthermore, armoring can result in the loss of beach and intertidal areas through a process that has been termed "passive erosion." Areas that undergoing long-term net erosion experience a natural landward movement of the entire beach system during periods of sea level rise; such has been the case for approximately the last 18,000 years. As cliffs and sand dunes retreat, the vacated area becomes part of the beach environment and the position of the beach shifts landward. Building a protective structure in front of a cliff or dune temporarily stabilizes the seaward location of the cliff or dune edge, however beach erosion continues. Since no new beach area is created through cliff or dune retreat, a net loss of beach area occurs. Ultimately, as erosion continues, this process also will result in the loss of the intertidal zone, as waves impact the seawall at all



times, low tide as well as high.

Vertical structures in particular can deflect wave energy causing increased erosion and altering natural habitat in front of the structure. Reflected wave energy may make it difficult for organisms to inhabit the area because of high turbidity. Erosion caused by the reflection of wave energy is more severe with vertical structures than with curved, stepped, or inclined structures, which absorb or disperse the energy of the waves. The significance of this reflected wave energy will vary, depending upon how frequently the wall is inundated or impacted by waves, and how much the reflective characteristics of the wall differ from the natural shoreline[8]. A wall that is only subject to wave attack once a decade would only alter the reflected wave energy once a decade. Also, a vertical bluff and a vertical wall would have fairly similar reflective characteristics, while a dune and a vertical wall would be very different.

Potential biological impacts of coastal armoring include changes in abundance and distribution of species. Coastal armoring structures can influence the structure of benthic communities, due to potential differences in settlement patterns for natural substrates and armoring structures. Armoring structures can encroach into the intertidal, or disturb important buffer areas such as marsh habitat between the marine and terrestrial environments, which naturally mitigate erosion, and play an important role in flushing of certain contaminants[9]. Certain structures can also provide habitat for predatory species not normally associated with the beach and intertidal zone such as rats and squirrels, which can feed on intertidal organisms, compete for food with native species, and transmit disease.



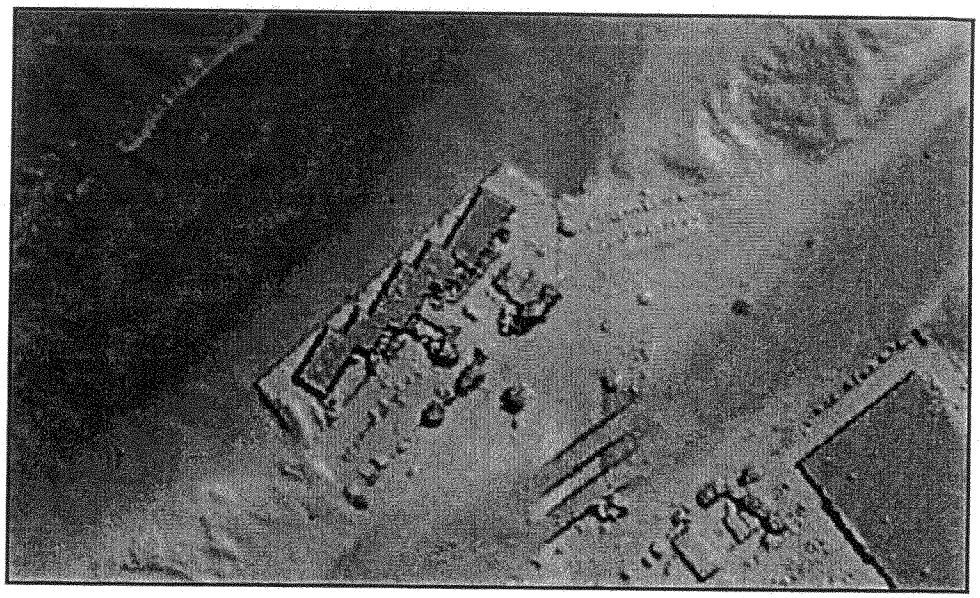
Seawalls can have recreational impacts as well, by blocking both vertical and lateral access to beaches, and altering wave patterns, which can negatively impact surfing conditions. Additionally, coastal armoring can act as a barrier to wildlife, by blocking access of certain species to the beach.

Environmental impacts that occur during the construction phase of coastal armoring projects are generally short term, lasting only a few days to a few weeks. Problems include increased turbidity caused by suspended solids in the immediate vicinity of the construction site, and the risk of chemicals or other materials entering the ocean from construction activities. Structures constructed in the intertidal zone have more impact than those constructed above the high tide line. Certain types of structures such as riprap revetments have fewer initial impacts than other hard structures, since construction normally requires significantly less excavation than, for example, a seawall. Permanent impacts of revetments however, are similar to those of seawalls, and the footprint of the revetment is typically larger. Many short-term construction impacts can be minimized through appropriate mitigation. Mitigation measures include scheduling of the construction phase to reduce impacts by considering animal migration patterns, spawning patterns, etc., and specific actions such as the use of silt curtains[10].

Existing MBNMS Regulations

Sanctuary regulations prohibit alteration of the seabed, and all armoring structures placed below the mean high tide line require approval from the MBNMS. The Sanctuary regulates coastal armoring by authorizing Commission permits, and issuing specific conditions on those permits. Many seawalls have been constructed with no notification to or authorization from MBNMS. Throughout its first decade, MBNMS' review of seawalls primarily focused on minimizing impacts from the construction process rather than long-term impacts from the armoring itself. However in 2002, as part of it's management plan update process, the Sanctuary shifted focus to conducting long-term

planning as to the consequences of coastal armoring and its affect on some of the Sanctuary's most treasured resources, its beaches, bluffs, and coastline.



A NOAA response to a comment urging the Sanctuary to prohibit the construction of seawalls, in the MBNMS Final Environmental Impact Statement states: "Activities that require drilling into, dredging, or otherwise altering the seabed of the Sanctuary, or constructing, placing, or abandoning any structure, material, or other matter on the seabed of the Sanctuary are prohibited (with a few exceptions) except as allowed under 15CFR § 944.11 or exempted under activities related to the maintenance of harbors. Seawall construction would not be allowed." This statement clearly indicates the intent to prohibit seawall construction that is inconsistent with current and past practices. Nonetheless, the regulations adopted for the Sanctuary allow Sanctuary management to allow development, otherwise prohibited, by "authorizing" other agencies' permits, such as the Coastal Commission. There are three activities that MBNMS regulations expressly do not allow a sanctuary manager to permit—oil and gas development, designating new dredge disposal sites, and new sewage outfalls. The express regulatory prohibitions for which permits cannot be issued do not include seawalls. Thus MBNMS staff has interpreted this response to comment in the context of the regulatory framework set up in 1992.

Development along the coast increases the pressure to protect coastal structures with various types of coastal armoring such as seawalls, bulkheads and revetments to manage erosion. Approximately 14 miles of the approximately 290 miles of coastline is already armored in the MBNMS, and this amount is estimated to double if trends continue[11]. In light of this situation, The MBNMS has recently begun to take a more active role in addressing coastal armoring, and has developed an action plan with the goal of minimizing impacts to Sanctuary resources from coastal armoring, while recognizing the issue of protecting private and public property. This action plan lays out the framework for a more proactive and comprehensive regional approach, seeking alternatives to the current practice of responding to coastal erosion merely by protecting the coastline with hard structures such as seawalls and revetments.

CITATIONS:

1. California Resources Agency. Draft Policy on Coastal Erosion Planning and Response and Background Material. March, 2001
2. California Resources Agency. March, 2001.
3. Griggs, Gary B., Pepper, James E. and Jordan, Martha. California's Coastal Hazards: A Critical Assessment of Existing Land-use Policies and Practices. California Policy Seminar, University of California. 1992.
4. U.S. Army Corps of Engineers. Engineer Manual. Design of Coastal

Revtments, Seawalls, and Bulkheads. 1995.
5. California Coastal Commission. ReCAP Pilot Project Findings and Recommendations: Monterey Bay Region. September, 1995.
6. Griggs, Gary. California Needs a Coastal Hazard Policy. Coast and Ocean Magazine. Volume 13, No. 3. 1998. http://www.coastalconservancy.ca.gov/coast&ocean/autumn98/a04.htm.
7. Monterey Bay National Marine Sanctuary Final Environmental Impact Statement/Management Plan. Appendix F, Page 36. June, 1992.
8. Griggs, Pepper and Jordan. 1992
9. U.S. Army Corps of Engineers. 1995
10. U.S. Army Corps of Engineers. 1995
11. U.S. Army Corps of Engineers. 1995
12. California Coastal Commission. 1995

PHOTOGRAPHS: First 5 on this page are courtesy of Brad Damitz (MBNMS). The last one is LIDAR imaging technology of the erosion patterns around the Monterey Beach Resort's seawall.

Response to Comment 10-1:

Comment noted.

Response to Comment 10-2:

Several issues are raised in the referenced document, "Monterey Bay National Marine Sanctuary: Resource Management Issues." The potential impacts of the proposed project on biological resources were discussed in the EA and determined to be insignificant. The revetments would extend slightly into the upper intertidal and would replace a small amount of sand/cobble beach with rock which supports organisms typical of the high intertidal zone of rocky shores. The revetment alternatives may possibly have some effect on the diversity of organisms in the adjacent intertidal beach.

The potential for structures to accelerate erosion is discussed above in response to Comment 3-1. It is true that bluff protection structures fix the back of the beach and prevent the increase in beaches from passive erosion as the bluff retreats. However, in this case, the "vacated area" is the area currently occupied by the roads, bluff top parks and trails, and lift stations that the project is trying to protect to remain in place.

Another concern raised is the impact of the structures on wave patterns. The structures will not alter the offshore bathymetry and thus will not affect the shape of the waves as they come ashore. Wave reflection may occur when the structure, especially a vertical wall, is within the wave uprush zone. Although the proposed seawalls are to be constructed above the high tide line (based on the September 2009 beach condition) and as landward as possible, the seawalls would be farther seaward than the existing near-vertical bluff face. It is thus likely that the seawall could be within the wave uprush area during other times of year when the beach is in a more eroded stated. During these times of year and high tide conditions, additional wave reflection from the shoreline seawall could occur. This impact to surfing is considered to be relatively small, given that the waves are already modified by the existing nearshore rocky reefs and bluff shorelines at most sites, the small shoreline length of the structure relative to the overall bluff face length in each of the areas, and the limited times of year when reflection could occur.

Response to Comment 10-3:

The USACE recently has completed a geotechnical assessment of bluff erosion in the project area. The bluffs in the project area are subject to erosion from wave attack as well as from terrestrial forces such as runoff from the top of the bluffs. At all of the sites the study found that marine erosion was greater than subaerial erosion factors. The erosion rate in the project area averaged between 5.6 and 9.4 inches per year. However, bluff failure generally happens in periodic large events.

At the St. Andrews site, there is native rock along the base of the bluffs, but the toe of the bluffs are being undercut by wave erosion. The rate of erosion for the bluffs in the vicinity of St. Andrews lift station is approximately 8 inches per year. The bedrock is unfavorably oriented to the ocean and makes the bottom of the bluffs subject to ongoing marine erosion that is still severe, and subject to more direct wave attack, especially in the exposed areas just upcoast and downcoast of the existing seawall. A well developed notch is still forming along the entire bluff face, just upcoast of the existing sea wall. The location of the proposed structure would prevent the expansion of the notch that follows bedrock and extends to the bluff top.

At the Vista del Mar lift station site, the bedrock on the bluff contains exposed vertical to steeply vertical bedding planes, oriented parallel to the direction of the incoming ocean waves, which further weakens the toe of the cliff and makes the bedrock more susceptible to wave attack. Many sea caves and vertical gullies have formed within the bedrock preferentially aligned with its bedding. Most of the gullies have eroded through the entire thickness of the bedrock and continued into the overlying terrace soils of the cliff along this reach.

Similarly, at the Ocean Park site there are sea caves which continue to erode and eventually form stacks. Throughout the reach, the bedrock contains exposed moderate bedding planes, oriented parallel to the coastline and perpendicular to the incoming ocean waves, which further weakens the toe of the cliff and makes the bedrock even more susceptible to wave attack.

Throughout the reach that includes the Price Street sites, the bedrock contains a series of exposed vertical to steeply vertical bedding planes, orientated parallel to the direction of the incoming ocean waves, and highly weathered-decomposed rock zones, which further weakens the toe of the cliff and makes the bedrock more susceptible to wave attack. Many large 20- foot high sea caves and undercutting have occurred within the bedrock, preferentially aligned with its bedding and decomposed zones. Most of the undercutting has occurred at the bedding planes and has caused the overlying thick bedrock to fall in slabs or layers. The remains of the slabs can be seen as piles of talus and boulders beneath the falls. The eventual sea cave collapse will cause a large amount of bluff to erode in one episode.

At the Cypress Street site bluff erosion appears mostly dependent on episodic wave attack during severe ocean derived storms. As toe erosion occurs, the instability of the marine terrace bluff deposits results in more bluff top retreat as the material seeks a flatter and more stable configuration.

In summary, all six sites exhibit signs of erosion from wave attack. Because waves will continue to attack the bluffs, this erosion will continue without the proposed bluff protection eventually leading to bluff failure and the loss of infrastructure on the bluff tops.

Response to Comment 10-4:

The City of Pismo Beach can find no record of when the existing shoreline protection structures at the project site were constructed. The City believes they were constructed prior to the 1970's. The existing structures have not been effective at preventing erosion at the sites because erosion is continuing. The structures proposed for this project will be designed by coastal engineers who have the benefit of many years of study of failed coastal structures and

who will design the structures to adequately protect the bluff toe and minimize erosion of adjacent areas.

Response to Comment 10-5:

The project purpose is to protect public infrastructure. This public infrastructure includes roads (Seacliff Drive, Ocean Blvd., Cypress St.), lift stations and other utilities, as well as parks, bluff top trails, benches, and other recreational amenities.

Response to Comment 10-6:

The reference Moffatt & Nichol 2010 is the Coastal Engineering Appendix to the Feasibility Study. The complete reference will be added to the Final EA/MND.

Response to Comment 10-7:

At the St. Andrews site, there is native rock along the base of the bluffs, but the toe of the bluffs are being undercut by waves. The design intent is to place the shore protection structure just seaward of the bluff toe to minimize further toe erosion. The length of the proposed seawall would extend farther north than the existing seawall which would address end effect erosion risks to the lift station associated with the existing seawall. Additionally, the soil backfill and bluff-face shotcrete application would help to stabilize the bluff at this location, where the lift station is already very close to the edge of the bluff.

The rate of erosion for the bluffs in the vicinity (approximately 1,000 feet downcoast and 1,000 feet upcoast) of St. Andrews lift station area is approximately 8 inches per year. This is an average erosion rate for the bluffs in this particular localized area. The erosion rate for the bluffs immediately below and adjacent to the lift station is truly much lower due to the construction of the existing seawall. There are bedrock exposures downcoast and upcoast of this seawall. Most of the bluff face in this area is made up of terrace soils. The bottom of the bluff face is made up of a thin bedrock layer. This orientation of the bedrock layers is also more in line with the direction of the ocean waves. There are also numerous large notches (shoehorn shaped), which are eroded into the entire height of the bluffs, as evidenced by the spurlike traces of the bluffline in this vicinity. These notches follow this same orientation as the bedrock bluff bottom layer. There is also smaller rilling erosion features evident only along the upper bluff face within the terrace soils. The rilling is indicates that sheetwash or terrestrial directed erosion is still occurring along the upper bluff face. There are also a few storm drainage pipes that exit the bluff top soils in this vicinity, and most of the pipes overextend in length towards the ocean. This indicates that stormwater exiting the pipes is still falling off and away from the cliff face and not running along the edges of the of the cliff face and is not a large contributor to the rilling type of erosion. The rills and the notches extend from the bluff face down to the bedrock bottom layers of the bluff. The slope of the soils at some of the very top portions of the bluff is gently sloping away from vertical. However, the overall plumbness of the bluff face of

both the terrace soils and the bedrock is predominantly vertical. This suggests that the erosional rate of the soils and the bedrock toe are approximately equal. The proposed Corps of Engineers constructed seawall design shows a part of the downcoast seawall length overlapping against the existing seawall length. The length of the USACE seawall also extends upcoast past the lift station. The intent of the design is to provide enough length of seawall to cover both the existing seawall; and to protect the bedrock bluff bottom layers that are still exposed beneath the lift station and exposed just upcoast of the existing seawall. A well developed notch is still forming along the entire bluff face, just upcoast of the existing seawall and below the lift station. The location of the USACE seawall will prevent the expansion of the notch that follows bedrock and extends into the bluff top. The overlapping of the proposed seawall against the existing seawall will also eliminate future erosion of bedrock and bluff face that would follow the weak plane leftover from a gap between the two walls, if not covered.

In summary, the bedrock, although thin, is unfavorably orientated to the ocean and is thus makes the bottom of the bluffs subject to ongoing marine erosion that is still severe, and subject to more direct wave attack, especially in the exposed areas just upcoast and downcoast of the existing seawall. The proposed structure is designed to baffle the effects of the more direct wave attack direction that occurs in the unfavorably orientated bedrock layers at the bottom of the bluff face, and to prevent continued notch type erosion features that are prevalent along the bluff face in the local vicinity of St. Andrews lift station.

Response to Comment 10-8:

Thank you for your information about the high level of use of the informal trail at the St. Andrews Lift Station site. Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 10-9:

The Project will not impact high value rocky intertidal habitat. The footprint of the structures does not extend into any high value rocky intertidal habitat. Construction equipment will not be placed within high value rocky habitat. Staging and service of equipment will be on the top of the bluffs. When equipment is on the beach it will be working in the pocket beach area at the base of the bluffs not in the high value rocky intertidal and surfgrass habitat. As an extra precaution, a biologist will identify the high value intertidal area and instruct the construction crew to avoid it. In addition, project construction is not expected to have indirect impacts on high value rocky intertidal habitat. Staging and servicing of construction equipment will be done on the bluffs not near the water. To prevent spills and leaks of fuels and lubricants from construction vehicles, Best Management Practices will be implemented to insure that fuels, lubricants, or other toxic materials are not introduced to the ocean. Construction would not be expected to introduce turbidity to project waters. Imported soil for the backfill would be stored

in the staging area on the bluffs not on the beach. Best Management Practices would be implemented during construction to make sure that backfill material does not get washed into the water. With these measures no impacts to sensitive rocky intertidal and surfgrass habitat would occur.

Response to Comment 10-10:

The EA/MND quotes the California Climate Change Center (CCCC) mean rate of 3.2 to 4.6 feet from 2000 to 2100. The proposed project considered local relative sea level rise over the next 50 years (2010 to 2060) ranging from 0.51 to 1.75 feet, based on the methodology specified in USACE Circular EC 1165-2-211, "Water Resource Policies and Authorities: Incorporating Sea-Level Change Considerations in Civil Works Programs" which takes into account local land movement. The 1.75 feet by 2060 is reasonably consistent with the CCCC predictions.

Response to Comment 10-11:

The EA/MND quotes the California Climate Change Center (CCCC) mean rate of 3.2 to 4.6 feet from 2000 to 2100. The proposed project considered local relative sea level rise over the next 50 years (2010 to 2060) ranging from 0.51 to 1.75 feet, based on the methodology specified in USACE Circular EC 1165-2-211, "Water Resource Policies and Authorities: Incorporating Sea-Level Change Considerations in Civil Works Programs" which takes into account local land movement. The 1.75 feet by 2060 is reasonably consistent with the CCCC predictions.

Response to Comment 10-12:

The 50-year project life is consistent with USACE policy. Fifty years is used for the economic analysis of cost/benefit ratios. Projecting beyond 50 years is considered too speculative. In addition to sea level rise, project design also used a 50-year recurrence extreme water level and wave run up calculations. For waves, a 100-year storm event was used.

Response to Comment 10-13:

The cumulative analysis considers the cumulative impact of projects that have not yet been built. Constructed projects are part of the existing environment.

Response to Comment 10-14:

Because the project area is fully developed inland of the narrow strip of park and trails along the bluffs, there is no feasible location to relocate utilities, Seacliff Drive, Ocean Boulevard, and bluff top recreational amenities such as parks, trails, benches, and overlook points.

Response to Comment 10-15:

Comment noted.

Response to Comment 10-16:

Comment noted.

Response to Comment 10-17:

Comment noted.

Comment Letter #11

From: Sandra Gore Nielsen <gorenielsen@gmail.com>
To: Smith, Lawrence J SPL
Sent: Fri Dec 17 17:54:07 2010
Subject: Pismo Beach Shoreline Protection Project Vista del Mar Lift Station comment

December 13, 2010

Office of the Chief, Environmental Resources Branch

US Army Corps of Engineers, LA District

PO Box 532711 Los Angeles CA 90053-2325

Re: EA/MND Pismo Beach Shoreline Protection Project: Vista del Mar Lift Station Seawall

To Whom It May Concern:

Comment 11-1

The negative impact on beach erosion by seawalls has been well documented and presented to countless commissions and courts of law. The information on record is based on history and does not include the consequences of rising ocean temperatures and sea levels.

Comment 11-2

The issue with the City of Pismo Beach and oceanfront lift stations is a classic example of a bad idea gone worse. A previous City Council elected to construct a sewage lift station in fragile, eroding coastal bluffs at the end of Vista del Mar, rather than take the long-term view of locating the station at the top of the hill. The geology of the bluffs alone made the location madness, but the engineering seemed easier at the time; the cost savings (reputed to be $80,000) seemed worth it.

In order to save money in the short-term, an unwise decision will not only end up costing much more, but will extract an environmental price to be paid by all citizens of California, not just Pismo Beach. We will lose our beach. The facts are in evidence in countless lawsuits and peer-reviewed publications.

The ocean will also eventually eat around the proposed seawall. Again, governing bodies are taking the short view. We are saving money in the short-term to spend more later. A seawall is a stopgap measure. The lift station will be endangered again.

Comment 11-2 continued

Where is the cost analysis of moving the lift station to where it should have been located from the outset vs. the long term costs of one seawall, followed by another? Instead of armoring the coast to protect—temporarily—manmade structures, should we not be considering relocation of what can be moved?

Comment 11-3

Private homes along that part of the coast have seawalls. The Army Corps investigators should have noted the erosion of the public beach and area around the stairs to the side of the neighboring private seawall. If a seawall is built to protect the lift station, the choice is to armor the cliffs all the way to the private seawall or accept that the sea will rapidly eat away the beach, public access stairs, and fragile bluffs between the two. Neither of these options is desirable.

We do not want untreated sewage to spill into the ocean. We want to continue to flush our toilets. But we do not want to pay the environmental—and eventual monetary—costs of constructing a seawall to protect machinery that should never have been put there in the first place.

Do we continue to put band aids on gangrene, or do we perform the necessary surgery to remove the disease?

Comment 11-4

The process, in our opinion, has utterly failed to uphold its obligation to public education and involvement. Where is the public outreach from the City of Pismo Beach? We were notified by the Army Corps because we own property across the street from the proposed project. But our neighbors, who enjoy the beach and viewing cliffs and benefit from the lift station, were not informed. What of citizens not living in proximity? It seems a false assumption that the only persons impacted would be those within 200-300 feet.

Comment 11-5

If there must be a seawall, please consider a sculptured wall designed to conform to the natural contours of the cliffs. As well, the Army Corps and the City of Pismo Beach need to understand and take into consideration the near-term negative impact of intermittent seawalls to the beach as well as the long-term negative impact of seawalls in general before making their decision.

Take the long view. Move the lift station.

Respectfully yours,

Sandra Gore Nielsen and Jesper Nielsen, PhD

Property owner 313 Vista del Mar

Shell Beach, CA

Response to Comment 11-1:

Erosion of beaches fronting shoreline structures is generally attributable to toe scour effects from poorly designed seawalls, and not wave reflection. For the proposed Pismo Beach structures, the intent is to design the structure so as to preclude return water from scouring the beach, by embedding the structure toe into bedrock, providing an armor stone toe apron, and proper elevation of the structure crest to prevent/minimize overtopping. Monitoring of beaches in Santa Cruz County at sites with and without revetments and seawalls showed that the beach profile adjusts nearly identically in front of revetments compared to locations without revetments. Revetment did not cause measurable erosion in front of the structures. The erosion that was measured was from the effects of reflection of the ends of the walls that are angled to the wave approach. These flank/end effects are discussed below.

There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to "rip currents" at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered and, accordingly, the ends of the structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

Response to Comment 11-2:

For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. It is difficult to relocate the lift station because the project area is completely developed inland of the narrow strip along the edge of the bluffs.

Response to Comment 11-3:

Comment noted. The existing shoreline protection structures appear to have been constructed prior to the 1970's. The existing structures have not been effective at preventing erosion at the sites because erosion is continuing. The structures proposed for this project will be designed by coastal engineers who have the benefit of many years of study of failed coastal structures and who will design the structures to adequately protect the bluff toe and minimize erosion of adjacent areas.

Response to Comment 11-4:

A notice about the availability of the EA/MND was placed in the newspaper, and mailed to the State Clearinghouse, in addition to the mailings to federal and state agencies and members of the public.

Response to Comment 11-5:

Sculpted walls were fully analyzed as an alternative in the EA/MND and are under consideration if they can be economically justified.

Comment Letter #12

From: studiobeach@charter.net <studiobeach@charter.net>
To: Smith, Lawrence J SPL
Sent: Fri Dec 17 01:01:22 2010
Subject: PISMO BEACH SHORELINEPROTECTION PROJECTENVIRONMENTAL ASSESSMENT/MITIGATED NEGATIVEDECLARATION

Dear Mr. Smith and any others concerned,

Comment 12-1

I have reviewed the draft report, specifically with regards to the location known as the St. Andrews lift station site, and find it to be incorrect in it's assessment of beach access. Page 30 of your report includes the following paragraph:

"The rock revetment alternative was selected for the St. Andrews Lift Station site. Two alternatives at this site (rock revetment and concrete vertical wall) have BC ratios greater than one and meet NED criteria. The rock revetment alternative was selected due to its lower cost, to the existence of rock at the site, and the lack of public access to the beach at this site."

This statement is incorrect. I personally use the rugged trail that starts at the end of Baker St. and heads down the hill to the beach. For the past 15 years I have used that trail about 80 times per year! My kids use it as well to access the beach and surf. This trail is used by hundreds of surfers and beach goers...maybe thousands, on a regular basis year after year.

Comment 12-2

The recommendation to pile rocks on the beach (rock revetment) will destroy this wonderful beach and public resource, and eliminate access to one of the finest surfs spots in the county.

How could your consultants miss the fact that there is beach access and is used almost every day of the year?

Comment 12-3

Wouldn't this rock revetment alternative also violate the California Coastal Act by eliminating beach access to the public?

I look forward to hearing from you regarding the false statements made in your report and the adverse solutions that were recommended based on this inaccurate assessment of the site.

Sincerely,

Bob Burke
309 Santa Fe
Shell Beach, Ca 93449

Response to Comment 12-1:

Thank you for your information about the high level of use of the informal trail at the St. Andrews Lift Station site. Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 12-2:

As discussed above, based on public input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 12-3:

Based on public input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Comment Letter #13

Original Message-----
From: Ryan Turner [mailto:jagalwy@yahoo.com]
Sent: Monday, December 20, 2010 10:32 AM
To: Smith, Lawrence J SPL
Cc: sdamron@surfrider.org
Subject: Pismo Beach Shoreline Project

Mr. Smith,

Comment 13-1

I was recently contacted by the Surfrider Foundation to provide an expert opinion as a Licensed Civil Engineer for a project proposed by the Corp and City of Pismo Beach to place rock revetments at several locations in Shell Beach and Pismo Beach. I reviewed the project documents and am deeply concerned that the reports do not address the very important issue of beach access. As a Pismo Beach resident and avid surfer, fisherman, and beach-goer, my family and I frequently use the beaches identified as potential sites for construction of rock revetments on the beach. In particular, I have been using the Saint Andrews site at the end of Baker Street for over 20 years to access the ocean via the trail down the bluffs. It seems that the report was either mistakenly prepared or overlooked the beach access at several locations to avoid preparing an environmental impact report. Stating the the locations are not used for beach access is entirely false, as can be attested to by the hundreds of surfers, fishermen, and other beach-goers that use the bluffs to access the ocean. Construction of rock revetments will make the access to the ocean very dangerous and maybe impossible.

Comment 13-2

As recently demonstrated by the nearby SOAP project, beach access is very important and should be considered in evaluating any type of project near the ocean. In my professional opinion, other alternatives to prevent bluff erosion are better suited to maintaining access while still protecting the private and public properties on the bluffs. Please do not move forward with the flawed project report; maintaining beach access is of paramount importance and is an invaluable resource for our coastal community. Please do not hesitate to contact me via email with any questions or comments,

Sincerely,

Ryan Turner P.E.

Response to Comment 13-1:

Thank you for your information about the high level of use of the informal trail at the St. Andrews Lift Station site. Comment letters on this EA/MND were very helpful in identifying public access issues and recreational use on this site. Based on this input, the construction of a sculpted seawall rather than a revetment has been selected for this site and public access will be maintained. The City of Pismo Beach has committed to constructing a public stairway at the site. The upper shotcrete will be sloped to allow access to the stairs.

Response to Comment 13-2:

Comment noted. Impacts to public access were analyzed in Section 4.7.2.

Comment Letter #14

California Regional Water Quality Control Board
Central Coast Region

Linda Adams
Secretary for Environmental Protection

Internet Address: http://www.waterboards.ca.gov/centralcoast/
895 Aerovista Place, Suite 101, San Luis Obispo, California 93401
Phone (805) 549-3147 • FAX (805) 543-0397

Arnold Schwarzenegger
Governor

December 23, 2010

BY ELECTRONIC AND REGULAR MAIL

Josephine R. Axt, Ph.D.
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles Division
Attention: Mr. Larry Smith (CESPL-PD-RQ)
lawrence.j.smith@usace.army.mil
P.O. Box 532711
Los Angeles, California 90053-2325

Dear Ms. Axt:

REQUEST FOR A SECTION 401 WATER QUALITY CERTIFICATION – PISMO BEACH SHORELINE PROTECTION PROJECT, SAN LUIS OBISPO COUNTY

Comment 14-1

The Central Coast Regional Water Quality Control Board (Central Coast Water Board) received the November 18, 2010 Draft Pismo Beach Shoreline Protection Project (Project) Environmental Assessment Mitigated Negative Declaration. The cover letter stated that if we do not issue a final determination on your request for a Section 401 Water Quality Certification (401 Certification) for the Project by January 17, 2011, you will assume a waiver of the 401 Certification and proceed with the Project. The Central Coast Water Board does not issue waivers of 401 Certifications. We require the U.S. Army Corps of Engineers obtain a 401 Certification prior to commencing the Project. To facilitate our review of the Project and our consideration of issuance of a 401 Certification for the Project, you need to submit a complete 401 Certification application. The application and associated information is at the following link:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/401wqcert/index.shtml

If you have questions please contact **Tamara Presser at (805) 549-3334** or via email at **Tpresser@waterboards.ca.gov**, or Phil Hammer at (805) 549-3882.

Sincerely,

Roger W. Briggs
Executive Officer

S:\Section 401 Certification\Certifications\San Luis Obispo\Pismo Beach Shoreline Protection Project - Letter to ACOE Requesting App.doc

cc:

Bruce Henderson
U.S. Army Corps of Engineers
Ventura Office
Regulatory Section
2151 Allesandro Drive, Suite 110
Ventura, CA 93001

Dwayne Chisam
City of Pismo
Public Works Director
dchisam@pismobeach.org

California Department of Fish and Game
Lake and Streambed Alteration
1234 East Shaw Street
Fresno, CA 93710

401 Program Manager
State Water Resources Control Board
Division of Water Quality
Stateboard401@waterboards.ca.gov

R9-WTR8-Mailbox@epa.gov

Response to Comment 14-1:

The Los Angeles District, on November 15, 2010, applied to the Central Coast Regional Water Quality Control Board (Board) for a Water Quality Certification under Section 401 of the Clean Water Act for the Pismo Beach Shoreline Protection Project. More than two months elapsed since the date of our initial request without final action by the Board. The Corps, therefore have presumed a waiver from the state water quality certification requirements of section 401 of the Clean Water Act. This action was taken in accordance with 33 CFR 336.1(b)(8)(iii).

Comment Letter #15

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

JAN 14 2011

Colonel R. Mark Toy
U.S. Army Corps of Engineers
Los Angeles District, CESPL-CO-R
P.O. Box 2711
Los Angeles, California 90053-2325

Dear Colonel Toy:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the U.S. Army Corps of Engineers' (Corps) Draft Environmental Assessment (DEA) for the Pismo Beach Shoreline Protection Project. NMFS offers the following comments pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA).

General Comments

Comment 15-1 There is inconsistent language regarding the selected alternatives on page 30 of the DEA. Specifically, according to supporting text, both the rock revetment and sculpted concrete wall were selected for the St. Andrews Lift Station. NMFS presumes that the statement regarding selection of the sculpted concrete wall alternative for the St. Andrews Lift Station was a typographical error.

Comment 15-2 Section 8.0 regarding environmental compliance does not include MSA as one of the applicable federal laws. In addition, FWCA is improperly described in the sub-heading 8.10 as U.S. Fish and Wildlife Service Coordination. It should read Fish and Wildlife Coordination Act.

Proposed Project

For purposes of this consultation, the proposed project involves shoreline protection activities at the St. Andrews Lift Station and Vista del Mar Lift Station sites. According to the DEA, these two sites were selected as priority sites for initial construction by the City of Pismo Beach. The rock revetment alternative is proposed for the St. Andrews Lift Station and a sculpted concrete wall is proposed for the Vista del Mar Lift Station.

The rocky revetment at the St. Andrews Lift Station site is expected to extend seaward to + 4 feet Mean Lower Low Water (MLLW). The concrete sea wall at the Vista del Mar Lift Station site would extend seaward to an elevation of +8 feet MLLW.

Magnuson-Stevens Fishery Conservation and Management Act Comments

Action Area

Comment 15-3

The proposed project occurs within essential fish habitat (EFH) for various federally managed fish species within Pacific Coast Groundfish, Coastal Pelagic Species, and Pacific Salmon Fishery Management Plans (FMPs). In addition, the project occurs within or in the vicinity of areas designated as a habitat area of particular concern (HAPC) for various federally managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process. As defined in the Pacific Groundfish FMP, the proposed project occurs within or in the vicinity of rocky reef and seagrass HAPC.

Effects to EFH

Comment 15-4

In general, coastal armoring has the potential to impact natural shoreline processes, such as placement loss, active erosion, and/or passive erosion. According to Dugan et al (2008)[1], the combination of rising sea levels predicted by climate change models and the increasing extent of coastal development and armoring will accelerate beach erosion and loss and increase ecological impacts to sandy beach ecosystems on a scale that is unprecedented. Shoreline armoring often results in a reduction and/or loss of intertidal beach habitat and a reduction in macrophyte wrack.

Comment 15-5

The footprint of the rocky revetment at the St. Andrews Lift Station is expected to permanently impact 0.09 acres of beach habitat and 0.09 acres of rocky habitat. Impacts are expected to occur within the supratidal and upper intertidal zone. As described in the DEA, conversion of sandy beach habitat may result in the degradation of the macroinvertebrate community by changing community composition and reducing species diversity. Furthermore, impacts of the revetment on the macroinvertebrate community may extend beyond the footprint of the revetment itself. This may affect foraging resources for various fish species. In addition, although the rocky revetment will provide hard substrate, it's relatively high profile compared to existing rocky habitat will likely increase desiccation stress. Thus, the revetment rocks may not support the same abundance and diversity of organisms as provided by the natural rocky intertidal habitat.

Comment 15-6

The project description is not comprehensive, but the DEA indicates that activities, equipment, and workers during construction of a revetment at the St. Andrews Lift Station site would disturb wildlife on the beach. In addition, construction descriptions and figures in Section 2.0 indicate that excavation and trenching will occur in the intertidal zone. Construction within the intertidal zone would adversely affect EFH by:

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[1] Dugan, J.E., Hubbard, D.M., Rodil, I.F., Revell, D.L., and S. Schroeter. 2008. Ecological effects of coastal armoring on sandy beaches. Marine Ecology: 29, 160-170

Comment 15-6 (cont.)

1) changing the physical, chemical, and biological characteristics of the substrate; 2) impacting or smothering immobile benthic communities in the footprint of the activity; 3) forcing mobile animals to migrate from the area; 4) creating limited short-term turbidity plumes; and 5) potentially directly or indirectly affecting adjacent habitats. Given that rocky reef and seagrass HAPC occur immediately adjacent to the construction site, NMFS believes these potential impacts require additional scrutiny.

Comment 15-7

Construction of a concrete sea wall at the Vista del Mar Lift Station site would impact 0.06 acre of sandy beach habitat above + 8 feet MLLW. Although less of an impact compared to a rocky revetment, the shoreline armoring may have adverse impacts to adjacent intertidal habitat given changes in natural shoreline processes.

EFH Conservation Recommendations

Based upon the above effects analysis, NMFS has determined that the proposed action would adversely affect EFH for various federally managed fish species within the Coastal Pelagic Species, Pacific Coast Groundfish, and Pacific Salmon FMPs. Therefore, pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NMFS offers the following EFH conservation recommendations to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

Comment 15-8

1. Given that the rocky revetment alternative will result in a greater impact to sandy beach and rocky reef habitat and there is a higher likelihood of impacts to adjacent, sensitive intertidal habitats than the seawall alternative, the St. Andrews Lift Station site should utilize a seawall approach to shoreline protection. According to the DEA, the seawall alternative would meet the project purpose and would achieve a Benefit Cost ratio greater than one.

2. The Corps and/or City of Pismo Beach should conduct pre- and post-construction surveys to map the coverage of rocky reef and seagrass habitat and characterize the quality of the habitat. The survey methodology should be approved by the Corps, in consultation with NMFS and other relevant agencies, prior to construction. The post-construction survey should be conducted within 90 days of construction completion. If impacts are identified in the post-construction survey, the applicant should develop and implement a compensatory mitigation plan to offset any identified losses in the quantity or quality of adjacent HAPC.

Statutory Response Requirement

Comment 15-9

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent

Comment 15-9 (cont.)

with our EFH conservation recommendations, you must provide an explanation of the reasons for not implementing those recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

Comment 15-10

Pursuant to 50 CFR 600.920(l), the Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations.

Fish and Wildlife Coordination Act Comments

Comment 15-11

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments to federal action agencies for the purpose of conserving fish and wildlife resources. NMFS has determined that sandy beach and rocky reef habitat may be negatively impacted by proposed project activities. As such, EFH Conservation Recommendations provided above also serve as FWCA recommendations to address these negative impacts.

Thank you for consideration of our comments. If you have any questions regarding these comments, please contact Bryant Chesney at Bryant.Chesney@noaa.gov or 562-980-4037.

Sincerely,

for Robert S. Hoffman
Assistant Regional Administrator
for Habitat Conservation

Response to Comment 15-1:

The text on p. 30 should have read, “The sculpted concrete wall alternative was selected for the Vista del Mar Lift Station site.

Response to Comment 15-2:

The Magnuson-Stevens Fishery Management and Conservation Act was described in section 4.4.1.2. but will be added to Section 8 in the Final EA/MND. Section 8.10 will be changed to read Fish and Wildlife Coordination Act.

Response to Comment 15-3:

Comment noted.

Response to Comment 15-4:

Erosion of beaches fronting shoreline structures is generally attributable to toe scour effects from poorly designed seawalls, and not wave reflection. For the proposed Pismo Beach structures, the intent is to design the structure so as to preclude return water from scouring the beach, by embedding the structure toe into bedrock, providing an armor stone toe apron, and proper elevation of the structure crest to prevent/minimize overtopping. Monitoring of beaches in Santa Cruz County at sites with and without revetments and seawalls showed that the beach profile adjusts nearly identically in front of revetments compared to locations without revetments. Revetment did not cause measurable erosion in front of the structures. The erosion that was measured was from the effects of reflection of the ends of the walls that are angled to the wave approach. These flank/end effects are discussed below.

There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to “rip currents” at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered and, accordingly, the ends of the structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

The structures proposed for this project would be designed to minimize erosion of the beach fronting the structures. The sea walls studied by Dugan likely were not designed to minimize beach erosion.

Response to Comment 15-5:

Comment noted.

Response to Comment 15-6:

Excavation for the toe of revetments would disturb intertidal organisms within the construction footprint. Excavation would be done on the dry beach at low tides with erosion control. Therefore, turbidity plumes would not be expected. The only impacts expected to adjacent habitats is a possible decrease in the diversity of the macroinvertebrate community on the beach adjacent to the revetment. This projected decrease in diversity is based on a study done in Washington and is speculative.

Response to Comment 15-7:

As discussed above, erosion of beaches fronting shoreline structures is generally attributable to toe scour effects from poorly designed seawalls, and not wave reflection. For the proposed Pismo Beach structures, the intent is to design the structure so as to preclude return water from scouring the beach, by embedding the structure toe into bedrock, providing an armor stone toe apron, and proper elevation of the structure crest to prevent/minimize overtopping. Monitoring of beaches in Santa Cruz County at sites with and without revetments and seawalls showed that the beach profile adjusts nearly identically in front of revetments compared to locations without revetments. Revetment did not cause measurable erosion in front of the structures. The erosion that was measured was from the effects of reflection of the ends of the walls that are angled to the wave approach. These flank/end effects are discussed below.

There are two potential end effects related to erosion of adjacent areas. The first is if a seawall or revetment extends seaward into the alongshore sediment littoral transport zone, then the structure could act as a groin blocking sediment transport to the downcoast areas. In the case of the proposed Pismo Beach shore protection structures however, these would not protrude below the low tide line (i.e. within the alongshore littoral zone) and thus would not block sediment transport to downcoast areas. The other effect is related to “rip currents” at the ends of the structures. For the proposed Pismo Beach shore protection structures, the design intent is to tie the structure into existing stable coastline features, including existing seawalls, to the greatest extent practical, and to construct smooth slopes on the ends of the revetments in order to minimize flanking. At some sites, the former results in a shoreline structure which is slightly longer than the feature to be protected at that site, but in general extending structures to do this becomes a balance of minimizing the structural footprint impact and minimizing flanking. Although the design intent is to minimize flanking, the potential for flanking must be considered

and, accordingly, the ends of the structures are to be located in areas where non-critical infrastructure is located, i.e. where some future shoreline erosion would be acceptable.

Response to Comment 15-8:

Comment noted about NMFS' preference for a sea wall at the St. Andrew's site. Pre-project surveys have already been done at a level appropriate for project location and description. The Corps has concluded that the proposed project will not impact high value rocky intertidal habitat. The footprint of the structures does not extend into any high value rocky intertidal habitat. Construction equipment will not be placed within high value rocky habitat. Staging and servicing of equipment will be on the top of the bluffs. When equipment is on the beach it will be working in the pocket beach area during low tide at the base of the bluffs not in the high value rocky intertidal and surfgrass habitat. As an extra precaution, a biologist will monitor construction activities. The environmental commitment for a monitor contained in the Draft EA/MND shall be revised to include anytime construction equipment is operating on the beach. In addition, project construction is not expected to have indirect impacts on high value rocky intertidal habitat. Staging and servicing of construction equipment will be done on the bluffs not near the water. Best Management Practices will be implemented to ensure that fuels, lubricants, or other toxic materials are not introduced to the ocean. Construction would not be expected to introduce turbidity to project waters. Imported soil for the backfill would be stored in the staging area on the bluffs not on the beach. Best Management Practices would be implemented during construction to make sure that backfill material does not get washed into the water. With these measures no impacts to sensitive rocky intertidal and surfgrass habitat would occur. Therefore, no monitoring of the type recommended by the NMFS is needed. The City of Pismo Beach, however, has agreed to fund and conduct the requested monitoring program. Survey methodology will be coordinated with NMFS and California Department of Fish and Game.

Response to Comment 15-9:

Comment noted.

Response to Comment 15-10:

Comment noted

Response to Comment 15-11:

Comment noted.