2 ENVIRONMENTAL IMPACT ANALYSIS

Through project scoping for the Beacon's Beach Access Project (project), the City of Encinitas (City) has determined that the issues analyzed in this chapter have the potential for significant environmental impacts. Issues not discussed in this chapter, and which do not have the potential for significant environmental impacts, are discussed in Chapter 7—Effects Not Found to be Significant. This section discusses the environmental setting, impacts, and mitigation measures for the issues of geology and soils, visual quality/aesthetics, water quality, recreation, public safety, and paleontological resources.

2.1 GEOLOGY AND SOILS

2.1.1 Environmental Setting

The following discussion of the existing geologic conditions is based on field reconnaissance, a review of published and unpublished geotechnical and geologic literature, and geologic maps referenced in Chapter 9—References.

2.1.1.1 Physiographic Setting and Topography

The project site is situated on the coastal plain of the Peninsular Ranges Geomorphic Province west of the interior upland area (characterized by intermediate mountains and intervening valleys). The coastal plain area has undergone several episodes of marine inundation and subsequent marine regression throughout the last 54 million years, resulting in the deposition of a thick sequence of marine and non-marine sedimentary rocks on the uplifted and eroded high-relief basement terrain. Gradual emergence of the region from the sea occurred in Pliocene-Pleistocene time (last 1 to 2 million years), and numerous wave-cut platforms, most of which were covered by relatively thin marine and non-marine sedimentary deposits, formed as the sea receded from the land. Each marine terrace was formed during a Pleistocene sea-level high, and tectonically uplifted. Each subsequent sea-level rise produced a new terrace, eventually forming a series of terraces along the modern Encinitas shoreline, with the oldest terrace occupying the highest elevation (approximately 300 feet above mean sea level [MSL]). The number and spacing of terraces are generally determined by the rate of tectonic uplift and the nature of the coastal processes. A series of four terraces can be observed in the vicinity of the project site.

In general, three principal elements are recognized on an erosional coastal terrace: a wave-cut platform, an inner edge (shoreline angle), and a sea cliff (refer to Figure 2.1-1). A wave-cut platform has a shallow seaward dip of 0.01 to 0.02 feet per foot (Ritter and others, 1995; Group Delta Consultants, 1998). The modern wave-cut platform forms as the sea cliff retreats and stands slightly below the water level at the high tide. An inner edge marks the highest sea level maintained during any glacial/interglacial time.

The project site occupies a portion of the first marine terrace; the coastal bluff (westernmost edge of the marine terrace); and the adjacent beach, a part of the nearly continuous ribbon of beaches that borders the western edge of the coastal plain. The site elevations range from approximately 10 feet MSL to approximately 98 feet MSL at the parking area along Neptune Avenue just south of Jasper Street (URS, 2003). The bluff generally slopes down to the beach at an inclination of

Figure 2.1-1: Generalized Coastal Morphology

[INSERT B&W FIGURE]

2:1 to 1:1 (horizontal: vertical), although nearly vertical faces 10 to 20 feet high may be observed in the landslide area of the site.

A shore platform extends for approximately 500 to 900 feet offshore from the beach line. The platform slope varies from 45:1 (to 12 feet deep) to 35:1 (to 60 feet deep). In a modern environment, this represents an erosional wave-cut platform.

2.1.1.2 Soils

The United States Department of Agriculture's (USDA) 1973 Soil Survey of the San Diego area recognized one soil-mapping unit (Marina loamy coarse sand-mapping unit) and one land type (coastal beaches) in the study area (USDA, 1973). The majority of the study area is mapped as Marina loamy coarse sand. Coastal beaches are mapped as a narrow oceanfront unit along Beacon's Beach (see Figure 2.1-2).

According to the USDA Soil Survey, the Marina series consists of somewhat excessively drained, very deep loamy coarse sands derived from weakly consolidated to non-coherent ferruginous eolian sand. These soil series are formed on old beach ridges. The Marina loamy coarse sand, with 2 to 9 percent slopes, has a dominant slope of 4 percent. The soil is characterized by slow to medium runoff, a holding capacity of 4 to 5 inches, and rapid permeability (6.3 to 20 inches per hour). The erosion hazard is slight to moderate. The rooting depth is more than 60 inches.

The USDA Soil Survey describes the coastal beaches land type as gravelly and sandy beaches along the Pacific Ocean where the shore is washed and rewashed by ocean waves. Part of this land type is likely to be covered with water during high tide and stormy periods.

2.1.1.3 Geologic Setting

The general vicinity of the study area is underlain by the Tertiary sedimentary rocks capped by the Quaternary marine and non-marine sediments deposited on a series of wave-cut terraces (see Figure 2.1-3).

The middle Eocene sedimentary rocks underlying the study area and its vicinity were deposited in a continental shelf environment and form a thick sequence of interbedded sandstone, siltstone, and claystone. There are differences in lithostratigraphic interpretation of these rocks. Regional geologic mapping by Tan and Kennedy (1996) recognizes these strata as the Santiago Formation. Other geologists mapped them as the Del Mar Formation (Wilson, 1972) or the Ardath Shale (Eisenberg, 1983) of the La Jolla Group (URS, 2003). During the recent geotechnical investigation, URS consultants considered these deposits as the Ardath Shale of the middle Eocene age (47 to 49 million years old).

Four erosional terraces are recognized in the site vicinity. The three younger terraces are correlated with the late Pleistocene (80,000 to 120,000 years old) Bay Point Formation, and the oldest terrace is correlated with the late to early Pleistocene (1,180,000 to 120,000 years old) Lindavista Formation (Tan and Kennedy, 1996; Kennedy, 1975). The project site is underlain by marine and non-marine deposits of the youngest (first) terrace. The site geology is presented as

Figure 2.1-2: Soil Survey

[INSERT B&W FIGURE]

Figure 2.1-3: Typical Erosional Coastal Profile

[INSERT B&W FIGURE]

described by URS (2003), from the youngest (Artificial Fill) to the oldest (Ardath Shale) geologic units.

2.1.1.3.1 Artificial Fill

Compacted fill was placed at the bluff top during parking lot grading. Fill soils were encountered in the study area along the upper bluff edge below the west edge of the parking lot. In addition, minor fill was placed along the access path behind the batterboards on the bluff. Riprap was observed in front of the bluff-protection wall south of the project area.

2.1.1.3.2 Beach Deposits/Replenishment Beach Fill

The modern beach deposits consist of unconsolidated sand with discontinuous near-surface and buried cobble beds in the back beach area. Historically, Beacon's Beach was characterized as a narrow, thin sand beach with a cobble berm (URS, 2003). Recent beach nourishment efforts completed as a part of the San Diego Regional Beach Sand Project (during which sand from dredging operations was placed on local beaches) raised the surface elevation of the beach deposits to between 11 and 12 feet MSL. Replenishment beach fill consists of fine to medium sand.

2.1.1.3.3 Landslide Deposits

Landslides and blockfalls are two main types of gravity-induced processes modifying the Encinitas coastline. The occurrence of landslide and blockfall deposits is closely related to the distribution of structural discontinuities (e.g., bedding planes, shears, joints, and faults). Landslide deposits in the site vicinity are primarily rotational slump deposits associated with both marine terrace deposits of the coastal bluff and weak claystone of the Ardath Shale. Three large landslides and one small, ancient landslide were mapped by URS (2003) in the vicinity of Beacon's Beach. The northernmost of the four, Beacon's Landslide, underlies nearly the entire project area. Two smaller landslides were also observed north of the site during the May 2004 site visit. Some of these landslides are considered to be inactive/relatively stable, and some were recently remobilized. Common causes of landslide reactivation in the area are wave erosion and sea cliff undercutting, bluff-top grading, and groundwater/seepage. The smaller-scale blockfall deposits are episodic and may only be observed for a short period of time before they are washed offshore or redeposited as beach sediment.

The Beacon's Landslide has experienced both historical and recent movement, and is considered active (URS, 2003). Local geologic mapping (Hart, 2000) indicates that the landslide movement occurred on the lower of two bedding plane shear zones in the Ardath Shale that were traced along the sea cliff from this area for another 1,000 feet to the south (to the 20th Century Landslide). The landslide movement in the winter of 1982-83 resulted in considerable damage of the previous beach-access stairways, which had to be removed (and replaced with the present switchback trail) as a result. Landslide deposits consist of poorly graded fine sand (as encountered in URS [2003] borings B-3 and B-4) underlain by highly fractured claystone with blocks of shale on contact with the intact Ardath Shale (as observed in URS [2003] test pit TP-3). During the May 2004 site visit, the basal claystone/shale portion of the landslide mass could be observed at the back beach in the northern part of the site.

A relatively small landslide was mapped by URS (2003) near the western terminus of Europa Street. Two other significant recent landslides in the vicinity are the 1996 Landslide and the 20th Century Landslide. The 1996 Landslide, located on the 800 block of Neptune Avenue south of Beacon's Landslide, occurred in June 1996, apparently as a result of a combination of weak geologic structure (fractured claystone with weak, adverse bedding sheared along bedding planes) and wave erosion aggravated by extensive groundwater seepage. Initial movement on this landslide was indicated by earth cracks along the top of the bluff, and quickly progressed to a deep-seated translational movement along weak bedding planes at the sea cliff toe. The landslide is presently stabilized by a bluff protection wall protected with riprap at its toe. The remnants of the basal landslide mass can still be observed in front of the bluff-protection wall.

The 20th Century Landslide, the southernmost of the four, is the largest. According to URS (2003), its slide plain could be observed on the sea cliff at a relatively high elevation (15 to 18 feet MSL) in fractured claystone underlain by the resistant sandstone (lower part of the Ardath Shale based on URS (2003), or Torrey Sandstone based on Tan and Kennedy (1996). The area was overgrown with vegetation, which obscured rock outcrops during the site visit. Since the slide plane and the toe of the landslide are located above the highest sea level (and not significantly effected by wave erosion), the landslide is believed to be inactive/stable at the present time (URS, 2003). Both the sea cliffs and the upper bluffs south of the 20th Century Landslide are heavily armored with bluff-protection walls of different types.

2.1.1.3.4 Terrace Deposits

The Pleistocene terrace deposits form the upper bluff and are encountered at the highest elevations within the study area. The relatively thin upper portion of terrace deposits (above an approximate elevation of 75 feet MSL based on URS boring B-1) represents non-marine deposits and consists of poorly graded, fine to coarse sand with silt and cemented with iron oxide. These sediments are more cohesive than the underlying marine terrace deposits, and often form nearly vertical sea cliff faces (cemented cap). They are also prone to rilling. A similar type of deposit is sometimes referred to as beach ridge deposits (i.e., as described in Solana Beach by Group Delta Consultants, 1998), and is believed to form during a period of tropical to temperate climate associated with increased surface weathering, leaching, and precipitation of salts and minerals.

The lower portion of the terrace deposits is comprised of marine sediments that consist of massive, medium dense to dense, fine sand to silty sand, with fine to coarse sand below approximately 25 feet MSL. When oversteepened, these deposits slough back to flatter slope inclinations. Slope angles generally range from 35 to 65 degrees (USACE, 1996). The base of the terrace deposits ranges in elevation from 23 to 26 feet MSL (URS, 2003) and forms an erosional contact with the underlying Ardath Shale.

2.1.1.3.5 Ardath Shale

The middle Eocene Ardath Shale of the La Jolla Group is encountered at the lowest elevation within the study area. It is buried under landslide and beach deposits at the site and exposed at the base of the sea cliff north and south of the site. URS (2003) logged the Ardath Shale as interbedded siltstones and claystones underlain by cemented sandstone. The siltstones and claystones are generally dark green and fissile to massive, containing abundant fossil (shell) fragments and scattered hard concretions up to 10 inches in diameter, moderately jointed. Bedding plane shear zones were encountered in the siltstone at 12 to 15 feet MSL and at –1 to 0 feet MSL in the URS (2003) boring B-2 at the site.

The sandstone is yellow-brown, fine- to coarse-grained, cemented, and massive. The Ardath Shale is considered to be resistant to marine erosion (with sandstone beds less resistant than the siltstone/claystone beds) and is not generally characterized by notching and formation of sea caves. The lower sea cliffs formed by the Ardath Shale are nearly vertical when exposed off-site.

2.1.1.4 Geologic Structure

Based on the project Geotechnical Report (URS, 2003) and previous geologic mapping (Tan and Kennedy, 1996), the sedimentary strata in the area are relatively flat and generally continuous across the site. They are characterized by subparallel bedding planes, with siltstone and claystone beds often sheared along these bedding planes. Regional geologic mapping indicates that local bedding has a northeast strike and a dip of 5 degrees northwest. Shears, joints, and/or faults are common striking northeast and dipping 75 to 80 degrees northwest (Tan and Kennedy, 1996; URS, 2003). Structural data from the URS investigation indicate that bedding planes and bedding plane shears in the sedimentary layers beneath the site are dipping slightly (from 2 or 3 degrees to 5 degrees) to the north. The top of the Ardath Shale likely has a slight seaward dip typical of a wave-cut platform.

2.1.1.5 Groundwater

Moderate groundwater seepage was observed on the lower bluff face at the base of the Ardath Shale at the contact with overlying terrace deposits in several areas north and south of the project site (where the Ardath Shale is exposed). Groundwater is thought to be a main agent of subaerial erosion of coastal bluffs. Active subaerial erosion usually occurs in areas supporting a flow of groundwater along the contacts of lithologies of differing permeability (i.e., siltstone and claystone vs. sandstone). Groundwater flow in the lower sandstone cliffs occurs primarily along structural discontinuities and is an important factor in cliff stability. Artim (1985) reports that examination of rock falls after failure inevitably revealed the presence of water seepage near or at planes of failure.

The U.S. Army Corps of Engineers (1996) names the following as typical sources of groundwater: natural groundwater migration from highland areas east of the site, and infiltration of the terrace surface by rainfall and by agricultural and residential irrigation water. Uncontrolled irrigation water causes a rise in the water table and, especially if accompanied by uncontrolled surface runoff allowed to run over the bluff face, promotes slope failures and accelerates erosion of the upper bluff. Groundwater was observed in the bluff-top URS borings B-1 and B-2 at an approximate elevation of 25 feet MSL (approximate top of the Ardath Shale). In the slope borings B-3 and B-4, groundwater was encountered in the landslide deposits at an elevation of 10.9 feet MSL, and in the Ardath Shale (near the contact) at 6.2 feet MSL, respectively.

2.1.1.6 Faulting and Seismicity

The City of Encinitas lies within a seismically active region and is influenced by a number of fault zones within the regional San Andreas fault system that have been classified by the California Geological Survey as active (a fault that has had surface displacement within Holocene time or approximately the last 11,000 years) or potentially active (a fault considered to have been active during Quaternary time or the last 1,600,000 years). This definition is used in delineating Earthquake Fault Zones as mandated by the Alquist-Priolo Geologic Hazards Zones Act of 1972, most recently revised in 1997 (Hart and Bryant, 1997).

Review of available geologic literature (see Chapter 9—References) indicates that there are no known major or active faults on or in the immediate vicinity of the site. The nearest local faults just north and south of the site at the base of the bluff (URS, 2003) along the western limit of the 20th Century Landslide are inactive.

The project site is not within any Earthquake Fault Zones as created by the Alquist-Priolo Act. The nearest active regional faults are the Rose Canyon Fault Zone and the Newport-Inglewood Fault located approximately 2.8 and 9.6 miles from the site, respectively. A regional fault map is presented in Figure 2.1-4.

The historic record of earthquakes in southern California over the past 200 years has been reasonably well established. More accurate instrumental measurements have been available since 1933. Based on recorded earthquake magnitudes and locations, the project area has experienced moderate seismic ground shaking in recorded history. Review of historic earthquakes (Blake, 2000b) indicates that the most significant seismic event that impacted the site over the last 200 years was an event of Richter Magnitude (M) 6.5 that occurred in the year 1800 approximately 4.5 miles from the project site. This event was estimated to have caused a ground acceleration of approximately 0.3 acceleration due to gravity (g) at the site. An 1862 event of M5.9 (26 miles from the site) and a 1918 San Jacinto event of M6.8 (50 miles away) did not cause significant damage at the site. The 1986 Oceanside earthquake of M5.3 only produced seismic shaking of 0.04g at the project site. Some residents suspected that cracks in the bluff, which were the first indication of the 1996 Landslide, appeared following the 1994 Northridge earthquake (URS, 2003).

The State of California defines the maximum (credible) earthquake event as the maximum earthquake that appears capable of occurring under the presently understood tectonic framework. From a deterministic standpoint, Table 2.1-1 identifies potential seismic events that could be produced by the maximum (credible) earthquake event. Site-specific seismic parameters included in Table 2.1-1 are the distances to the causative faults, earthquake magnitudes, and expected ground accelerations determined with EQFAULT and FRISKSP software (Blake, 2000a and 2000c).

Figure 2.1-4: Regional Fault Map

[INSERT B&W FIGURE]

Table 2.1-1: Seismic Parameters for Major Active and Potentially Active Faults Affecting Beacon's Beach

Fault Zone (Seismic Source)	Distance to Project Site (miles)	Maximum (Credible) Earthquake		Modified Mercalli Intensity	Design Earthquake PHGA (g)
		Moment Magnitude	Peak Horizontal Ground Acceleration (PHGA) (g)*		
Rose Canyon	2.8	6.9	0.37	IX	0.35
Newport-Inglewood (Offshore)	9.6	6.9	0.19	VIII	
Coronado Bank	18.0	7.4	0.16	VIII	
Elsinore-Temecula	27.3	6.8	0.08	VII	
Elsinore-Julian	27.3	7.1	0.10	VII	
Palos Verdes	39.7	7.1	0.07	VII	

Sources: Blake, 2000a and 2000c

* g = acceleration due to gravity

As indicated in Table 2.1-1, the most significant possible seismic event at the site (with respect to ground shaking) would be an earthquake of moment magnitude[1] 6.9 associated with the Rose Canyon Fault Zone. Such an event would generate a peak horizontal ground acceleration of 0.37g at the project site. From a probabilistic standpoint, a peak horizontal ground acceleration with a 10 percent probability of being exceeded in 50 years (a design ground motion, per the International Conference of Building Officials, 1997) is estimated to be 0.35g at the site.

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[1] Moment magnitude is the measure of total energy released by an earthquake. Moment magnitude is the measurement and term generally prefered by scientists and seismologists to the Richter scale because moment magnitude is more precise. Moment magnitude is not based on instrumental recordings of a quake, but on the area of the fault that ruptured in the quake. This means that the moment magnitude describes something physical about an earthquake. Moment magnitude is calculated in part by multiplying the area of the fault's rupture surface by the distance the earth moves along the fault.

2.1.1.7 Beach Replenishment

The San Diego Association of Governments (SANDAG) completed a sand replenishment program in June 2001, which increased the width of the beach fronting Beacon's Beach. The beach replenishment project provided 2.1 million cubic yards of beach-quality sand to 12 beaches from Oceanside to Imperial Beach within the Oceanside Littoral Cell. The area of sand fronting Beacon's Beach was 2,700 feet long and 120 feet wide (URS, 2003). The addition of the new sand is expected to reduce the potential for wave erosion of the base of the bluff, thereby reducing the likelihood of future large-scale movement of the Beacon's Beach Landslide.

2.1.1.8 Evaluation of Current Slope Stability

The coastal bluff at Beacon's Beach has experienced historic and continued instability associated with the 400-foot-long by 120-foot-wide landslide. Previous beach-access stairways were damaged by landslide movement during winter storms in 1982-83 (URS, 2003).

URS (2003) was retained to perform a geotechnical investigation of the Beacon's Beach Access Project, and the conclusion of the investigation is repeated as follows:

> *The existing landslide at Beacon's will likely continue to move; the slope movement is influenced by various factors... The rate of future movement is difficult to estimate. Based on the landslide behavior in the past, however, and the tendency of disturbed terrace deposits to flatten back to a more stable slope inclination, the extent of the slide will likely continue to progress upslope. It is anticipated that the landslide will eventually encroach on and damage the State Beach parking lot. Slope movement could be significantly accelerated as a result of moderate seismic shaking. The Regional Sand Project is expected to reduce the rate of wave erosion, which could, in turn increase the timeframe during which the slide could affect the parking lot. The protection afforded by the sand beach, however, could be removed in a single large storm. Continued slide movement will continue to necessitate spot repairs and maintenance of the existing pathway. Under existing conditions, there is some risk from bluff instability to persons using the path.*

Based on the conclusions of its investigation, the following recommendations were presented for the Beacon's Beach Access Project (URS, 2003):

> *To stabilize the existing slide and mitigate the potential for future failures, the following measures should be implemented: mitigation of erosion at the toe, improving the stability of the upper bluff, and improving surface drainage.*

Several options were evaluated to stabilize the landslide and existing parking lot. Based on the results of that evaluation, URS (2003) recommended that a shore protection device (bluff-protection wall) be constructed near the base of the bluff with tieback anchors drilled into the slope. A buttress fill slope should be constructed landward of the bluff-protection wall to stabilize the landslide and rebuild the bluff face. Drainage improvements were also recommended to reduce the amount of water that is allowed to infiltrate into the subsurface as well as the amount of water that is allowed to run over the top of the slope and onto the bluff face.

2.1.1.9 Tsunamis

A tsunami (incorrectly called a tidal wave) is a sea wave generated by submarine earthquakes, landslides, or volcanic activity that displaces a relatively large volume of water in a very short time. Several factors at the originating point, such as earthquake magnitude, type of fault, depth of earthquake, focus, water depth, and the ocean-bottom profile, all contribute to the size and momentum of a tsunami (Iida, 1969). In addition, factors such as the distance away from the originating point, coastline profile (including width of the continental shelf), and angle at which the tsunami approaches the coastline, also affect the size and severity of a tsunami. There have been more than 500 tsunamis reported during recorded history, most of them occurring within the Pacific Ocean; however, one of the largest tsunamis recently recorded (December 2004) occurred in the Indian Ocean as a result of a M9.0 earthquake. This event was the fourth largest earthquake to occur in the world in the last 100 years (USGS, 2005b).

Large tsunamis have been occurring in the Pacific Basin at an average rate of roughly one every 12 years. Table 2.1-2 shows a number of great tsunamis representing each of the major generating zones within the Pacific Basin.

Table 2.1-2: Major Tsunamis Recorded in San Diego County

Event/Location	Date	San Diego		La Jolla	
		Arrival Time (hours)	Wave Height (meters)	Arrival Time (hours)	Wave Height (meters)
Prince William Sound, Alaska	3/27/64	+6.2	1.1	+5.8	0.7
Southern Chile	5/22/60	+14	1.4	+14	1.0
Aleutian Islands	3/9/57	+6.9	0.5	+6.6	0.6
Kamchatka	11/5/52	+9.6	0.7	+9.6	0.2
Aleutian Islands	4/1/46	Unknown	0.4	+6.2	0.4
Sanriku, Japan	3/3/33	Unknown	Unknown	Unknown	0.3
Cape Arguello, California*	11/24/27	Unknown	0.05	+0.98	0.05

Source: Joy, 1968

* This is the only well-documented, locally generated tsunami in California history.

Tsunami wave heights and run-up elevations experienced along the San Diego coastline during the last 170 years (including the values presented in Table 2.1-2) have fallen within the normal range of tidal fluctuations (approximately 9 feet). Southern California is oriented obliquely (i.e., not directly in line) with the major originating tsunami zones, and it has a relatively wide (approximately 240 kilometers) and rugged continental shelf, which acts as a diffuser and reflector of remotely generated tsunami wave energy (Joy, 1968). These conditions, in addition to the geologic and seismic conditions (such as the strike-slip fault regime and the scarcity of large submarine earthquakes) along the coastline, also tend to minimize the likelihood of a large tsunami impacting the site. The Tsunami Research Group at the University of Southern California is currently working on a series of tsunami inundation maps for southern California (USC, 2005).

McCullough (1985) predicts that the average tsunami height in the San Diego region for an event with a 10 percent probability of exceedence in 50 years (approximate 500-year return period) will be approximately 11 to 13 feet MSL. Work by Garcia and Houston (1974) presents a similar 500-year return period wave height ranging from 11.1 to 12.7 feet MSL.

2.1.2 Environmental Impacts

2.1.2.1 Significance Criteria

This section focuses on potential geologic, seismic, and soils impacts on the Beacon's Beach Access Project. Impacts to the geologic environment would be considered significant if:

- unique geologic features of unusual scientific value for study or interpretation would be adversely affected;
- geologic processes, such as major landsliding or erosion, would be triggered or accelerated;
- substantially adverse alteration of topography beyond that resulting from natural erosional and depositional processes would occur; and/or
- substantially adverse disruption, displacement, compaction, or overcovering of the soil would occur.

Geohazards impacts on the project would be considered significant if:

- ground rupture were to occur due to an earthquake or a known active fault causing damage to structures, limiting their use due to safety considerations or physical conditions, or causing injury or death;

- earthquake-induced ground shaking were to occur causing liquefaction, settlement, or surface cracks at the location and attendant damage to proposed structures, causing a substantial loss of use or exposing the public to substantial risk of injury;

- historic soil failure were to occur due to liquefaction;

- slope failure were to occur on bluff areas that would be unstable on- or off-site as a result of the project;

- flooding caused by 100-year storm events were to combine with an extreme high tide or seismic sea wave capable of causing substantial damage to structures or exposing the public to substantial risk of injury; and/or

- seiches or tsunamis caused by nearby or distant earthquakes were to occur in the lifetime of the project are capable of causing substantial damage to structures or exposing the public to substantial risk of injury.

2.1.2.2 Impact Assessment

The reconfiguration of the parking lot at the top of the bluff along Neptune Avenue is designed such that the new parking area would be set back approximately 5 to 15 feet from the existing westward extent of the parking lot. Accordingly, this portion of the project would not cause significant impact to the geologic environment. Furthermore, the drainage improvements associated with this alternative would decrease the potential for groundwater to build up and cause activation of the landslide as well as reduce the potential for surface erosion of the reconstructed slope face.

The proposed trail improvements associated with the project would return the pathway to the current location after construction of the new slope face. Additional fill is proposed landward of the bluff-protection wall, which would return the slope inclination to its pre-landslide configuration. The fill would also cover the existing earth materials composing the bluff. These earth materials do not possess unique geologic features of unusual scientific value for study or interpretation (Kennedy, 1975). Accordingly, no significant impact to the geologic environment would occur.

The proposed landscape/drainage improvements include the addition of storm drain inlets and pipes. These improvements are proposed to increase the overall stability of the landslide and reduce the potential for erosion of the upper and lower bluff face. Accordingly, no significant impacts are anticipated.

The proposed shower and lifeguard stand would be constructed on the new fill slope with a deep foundation through the existing landslide debris or on spread footings founded on newly compacted fill soils. Accordingly, these structures would have a less than significant impact on the geologic environment.

The project also includes a bluff-protection wall and a new fill slope landward of the bluff-protection wall to mitigate wave erosion of the toe and to stabilize the landslide (URS, 2003). The wall would be embedded into competent formational materials and have a top elevation of at least 17 feet MSL to reduce the potential for wave overtopping (URS, 2003). The effect of bluff-protection walls on the geologic and beach environment is a subject of controversy.

2.1.2.2.1 Bluff-Protection Walls

Effects of Bluff-Protection Walls on Shoreline Erosion and Beaches

The importance of understanding the influence of bluff-protection walls and other engineered protective structures on the dynamics of the shoreline is well recognized. The active urbanization along the southern California coastline brought about concern on the part of coastal property developers and owners over the rates of cliff erosion and retreat, overall cliff stability, and possible mitigation options. The 1996 U.S. Army Corps of Engineers study reported an average sea cliff retreat rate at Beacon's Beach of 0.4 foot per year. The short-term rate of erosion accelerated following the severe El Nino storms of 1982-83 and 1997-98. As increased coastal erosion and cliff collapse jeopardized the existence of the upper bluff properties, a number of protective bluff protection walls were constructed at the base of the coastal cliff. With historically narrow or nonexistent beach, bluff-top residential structures were in jeopardy. About 450 feet of bluff protection walls were constructed to stabilize the 1996 Landslide and 600 feet of bluff protection walls were constructed south of the 20th Century Landslide, approximately 1,500 feet south of the project area.

In the vicinity of Beacon's Beach, the bluff protection walls prevented an immediate property loss, but were thought by some to have an adverse effect on the public beach. The interactions between beaches and bluff protection walls has been a subject of debate within the scientific community for the past 10 to 15 years, but there have been few long-term quantitative field studies available that documented these interactions. The majority of these studies lack sufficient data on long-term effects of waves, beach profiles, and shore configuration (Kraus, 1987; Wiegel, 2000). Dr. Wiegel (2000) reports only two well-documented and complete field studies (Griggs and others, 1994; Basco and others, 1994). Therefore, there is no documented scientific evidence that bluff protection walls cause beach or coastal bluff erosion.

The better-documented field studies conclude that bluff protection walls, in general, do not cause long-term beach erosion, except for special circumstances, such as the prevention of the erosion of dunes or sandy bluffs that supply downdrift beaches, or acting as a groin with resulting shoreline updrift and recession downdrift (Dean, 1987; Wiegel, 2000). Dr. Wiegel (2000) pointed out that comparisons of beaches with structures and beaches without structures often led to a conclusion that both types of beaches go through the same cycle of erosion and deposition under control of wave conditions offshore with no appreciable affect on the structure. In the majority of cases, bluff protection walls are constructed to protect structures landward from erosion due to other causes and, therefore, are located in areas where erosion is already occurring. As a result, erosional features may be observed adjacent to bluff protection walls, but they do not justify the conclusion that bluff protection walls cause erosion.

According to the Committee on Coastal Erosion Zone Management (CCEZM, 1990; Wiegel, 2000), properly engineered bluff protection walls and revetments can protect the land behind them without causing adverse effects to the fronting beaches. Proper design, construction, and maintenance of bluff protection walls and revetments are emphasized because improperly constructed bluff protection walls may, indeed, cause adverse impacts on adjacent property. It is often due to these impacts that bluff protection walls are blamed for causing erosion.

Although field observations may be compared at different shorelines and generalized conclusions may be made, it is clear that response of the beach to the presence of a bluff protection wall is site specific and should be studied as such. (Coastal processes in general are the same, but wave climates, beach profile dynamics, shoreline configuration, etc. vary from site to site.) However, in the absence of detailed studies in the Beacon's Beach area, the observations and conclusions of Griggs and others (1994) may be cautiously utilized.

Short-Term Effects

The majority of the field studies indicate that most of the direct effects of bluff protection walls on beaches are short-term, or seasonal. The impact of bluff protection walls on beaches is generally remedied during the recovery phase (see Tait and Griggs, 1991 for the list of references). However, each situation is unique, and bluff protection wall effects that proved to be seasonal at some sites were observed to be irreversible at the others. The following effects were observed at a variety of sites:

- End scour, or flanking, is the most often-observed bluff protection wall effect. It is manifested in accelerated erosion and the lowering of the beach adjacent to the side ends of the protective structure, especially at the downdrift ends. This effect is reported at shores backed by erodible dunes or bluffs. In some cases the end-scour effect is primarily due to the seaward location of the bluff protection wall on the beach profiles (e.g., projecting into the surf zone and obstructing the longshore sediment transport). In the other instances, it may be caused by wave reflection from the return or end walls (Tait and Griggs, 1991). This is also addressed under long-term effects.

- Scour trough formation was reported both on unprotected beaches and protected beaches in front of bluff protection walls, subsequent to hurricanes in South Carolina and Florida. The beach recovery results were variable, and no clear conclusions on the impact of the bluff protection walls on the beach recovery process could be drawn. No similar troughs were observed in response to storms in California (Tait and Griggs, 1991).

- Deflated (flat) profiles, or lowering of the beach elevations in front of bluff protection walls, were observed by Griggs and others (1997) during an erosive winter season in response to the interaction of waves with bluff protection walls. This effect is similar to scour trough, except that it is not hurricane induced, but rather limited to the duration of the winter erosional phase.

- Beach cusps were also observed by Griggs and others (1997) in front of bluff protection walls and appeared to correspond with the formation of deflated profiles.

- Sand accretion is sometimes observed when the bluff protection wall is projected into the surf zone (due to long-term erosion, seasonal beach-width fluctuation, or in response to a storm) and interrupts the longshore sediment transport, acting as a groin. The wider beach may be formed updrift of the wall, with the narrowing of the beach downdrift.

It is unlikely that any of the above short-term effects would be associated with a bluff protection wall constructed at the base of the relatively resistant cliffs at the project site (after the landslide deposits are removed and competent Ardath Shale material is exposed). Deflated profiles may be observed adjacent to both unprotected and protected cliffs, as the beach narrows or disappears, and the gradient of the beach profile may increase. Therefore, the short-term effects of the proposed shoreline protection structure are considered to be less than significant.

Additionally, alteration of the surf break may occur depending on the local near-shore profile and the amount of sand available. No data was available for review on the subject of bluff protection walls altering surf breaks. Some studies do indicate that the reflection of waves off bluff protection walls can cause a localized scouring near the bluff protection wall. It seems unlikely, however, that the surf break would be close enough to the bluff protection wall to be affected by wave reflection. In addition, Breemer (2004) points out, “many, if not most, of the best surf breaks in California are formed by reefs and jutting points, not sand bars. Others are located relatively far from shore. Fluctuating sand levels are of little consequence, as you can see at Rincon, Malibu, Cardiff, and other California beaches where surfers still catch vigorous waves even though nearby homeowners have erected walls to stave off storm surges. Seawalls have protected beach homes for decades, but no one has yet identified a surf break that was destroyed as a direct result.” Accordingly, an instance of a significant (adverse) alteration of a surf break in a wave environment similar to that found at Beacon’s Beach has not been documented.

Long-Term Effects

Tait and Griggs (1991) and Griggs and others (1994) concluded that the single most important factor in evaluating the potential effects of bluff protection wall construction on beach erosion is whether or not the shoreline is undergoing a net long-term retreat. The geomorphic shore type plays a role in the impact of stabilizing a shoreline undergoing net retreat (Tait and Griggs, 1991), such as the Beacon’s Beach shoreline. It has been long recognized by coastal engineers that the position of the bluff protection wall on the beach profile, and relative to the surf zone, is very important (Wiegel, 2000). The best location for the bluff protection wall is at the back of the beach where it protects against the largest storms (Tait and Griggs, 1991). Tait and Griggs (1991) conclude that construction of the bluff protection wall at the base of a cliff made of relatively resistant rock has little net effect on beach erosion. Based on the type of rock encountered (URS, 2003), it can be concluded that the Ardath Shale materials composing the sea cliff at the project site are relatively resistant, and their erosion is a minor source of the beach sand. Therefore, the long-term effects of the bluff protection wall on the beach, similar to the effects of the sea cliff on the beach, would limit beach retreat and cause the decrease of the beach width, until full disappearance of the beach. If the bluff protection wall is more resistant than the sea cliff, it would form a small headland over time (Tait and Griggs, 1991).

Long-term effects of bluff protection walls on beaches were summarized by SANDAG (1992) and Flick (2001) as follows:

- Long-term loss of beach width, or passive erosion: Sea cliff protective structures are used to halt sea cliff erosion. Bluff protection walls fix the base of the sea cliff and, hence, the back boundary of the beach. As long as the shoreline is experiencing a net retreat, a net sea-level rise, or natural sea cliff retreat, the width of the beach would decrease with the construction of a protective structure through a process called passive erosion. Where the pre-storm width of the fronting beach is less than approximately 200 feet, as is the case with Beacon's Beach, unprotected sea cliffs would be scoured at their base occasionally by storm waves in the San Diego area. The loss of beach through passive erosion is considered a significant impact.

- Reduction in sediment contribution to the littoral zone: Sea cliff erosion supplies coarse sand to the beach. Construction of protective devices reduces this contribution. The amount of sediment reduction that these devices cause is a function of the height of the sea cliff, the retreat rate, the length of the sea cliff that would be protected by the device, and the percent sand and coarser material in the geologic unit that is released during erosion. In summary, the length of the proposed 400-foot-long bluff protection wall is approximately 0.1 percent of the 66-mile-long shoreline of the Oceanside littoral cell (Group Delta Consultants, 1998). Accordingly, the loss of the contribution of the bluff on the project site to the total littoral cell is considered to be less than significant.

- Beach encroachment/placement of the protective structure: A protective structure constructed seaward of the base of the sea cliff has an effect on the fronting beach. The effect is the reduction in beach width that occurs at the time of construction because the landward boundary of the beach is moved seaward. Since the proposed bluff protection wall is to be placed at the base of the existing landslide debris, there would be a net loss of a few feet of beach in selected areas along with a net gain of usable beach downdrift of the littoral current (similar to a groin). Accordingly, the net cumulative effect to the geologic environment would be less than significant.

- Wave reflection: Reflective wave energy from a protective structure may result in the seaward transport of sand, thereby reducing mean beach width (over the long-term) of a narrow beach. This reflection is similar to the reflection provided by the existing lower bluff material and, therefore, is considered less than significant.

- Erosion of tidal terrace: If bluff retreat is fixed by a bluff protection wall, new tidal terrace would not be formed and it may be possible that the existing tidal terrace could be eroded to a level below mean tidal levels. If the protective sand is eroded due to a storm or long-term sand depletion, the eroded tidal terrace may not provide a dry surface for public access. The erosion of the tidal terrace may be considered significant from a geologic perspective.

- End scour: End scour, or flanking, has been recognized as one of the negative features associated with bluff protection walls. It has been recognized by engineers and has been documented (although not in sufficient detail) in the literature. One of the interesting aspects of such scour is the distinctive crescent shape it typically exhibits. Tait and Griggs (1991) summarize six bluff protection wall studies and note that end scour was observed in five. In addition, as noted in Tait and Griggs (1991), studies by McDougal and others (1987) indicate that the magnitude of end scour increases with the length of the bluff protection wall. Several small-scale model tests indicate that the downcoast extent of end scour is approximately 70 percent of the wall length while field observations indicate that the length of end scour ranges from 10 to 50 percent of the bluff protection wall length. Griggs and Tait (1988) note that the distance the wall extends into the surf zone may be a more relevant factor than wall length if end scour is associated with up-coast sand impoundment or the groin effect.

Bluff Protection Wall Design Effects on Beach Response

The role of bluff protection wall design as a controlling factor in beach response is not thoroughly understood. In their review, Tait and Griggs (1991) note that the less reflective (sloping or containing riprap apron at the toe, rough-surfaced, and permeable) bluff protection walls should dissipate more incident wave energy, and produce less scour than more reflective (vertical, smooth, impermeable) walls. It also may be true that the significance of the reflectivity of the bluff protection walls varies depending on the wave regime. Wiegel (2000) found no evidence that more permeable stone revetments have fewer effects on the beaches than bluff protection walls. The amount of scour seems to increase proportionally with the increase of the bluff protection wall length. However, it is generally accepted that the position of the bluff protection wall on the beach profile and the extent it projects into the surf zone plays a far greater role than its length (AMEC, 2001).

Effects of Bluff Protection Walls on the Coastal Upper Bluff

No documented studies by recognized experts were found discussing the effects of bluff protection walls on adjacent portions of the upper bluff. Based on the understanding of the relationship between the sea cliff and upper bluff erosion, it can be deduced that protection of the sea cliff from undercutting by wave action (by construction of the bluff protection wall) would decrease the number of upper-bluff slope failures due to the mass wasting processes (slides and slumps) and, thus, decrease short-term erosion. The long-term erosional rate of the upper bluffs is thought to be roughly equal to the long-term rate of the lower sea cliffs.

2.1.2.2.2 Tsunamis

The proposed design for the bluff protection wall (URS, 2003) indicates a wall-top elevation of approximately 17 feet MSL. Based on McCullough's data (1985), the return period for a tsunami wave of this height is more than 1,000 years (or beyond the economic life of the structure). Based on this analysis, there is a low potential for significant tsunami effects to the bluff protection wall and to the site.

2.1.2.3 Summary of Significant Effects

There are no known unique geologic features of unusual scientific value that would be adversely affected by the construction of the proposed bluff protection wall and the associated fill buttress. The proposed bluff protection wall and associated smaller structures would not significantly cause major landsliding or erosion, nor substantially alter the existing topography. Conversely, these structures are specifically designed to increase overall gross stability as well as reduce surface erosion.

Impacts of geohazards (seismicity, fault rupture, liquefaction, settlement, tsunami, etc.) on the proposed shoreline protection structure or on public safety would be less than significant because they would be mitigated by proper design (URS, 2003) as discussed below. The bluff protection wall would not be adversely affected by soil liquefaction since it would be properly engineered and founded into formational materials. The potential for ground rupture is not considered significant since no active faults are in the project area. The bluff protection wall would be designed to withstand flooding events, to consider the potential for slope instability, and to increase the landslide safety factor to greater than 1.5. In addition, the bluff protection wall would reduce the potential for future soil erosion or landsliding by reducing the undercutting of the Ardath Shale. This reduces the potential for failure of the overlying terrace materials that may eventually adversely affect the parking area or other bluff-top improvements and public safety. The effects of significant geohazards would be mitigated by design of the bluff protection wall in accordance with the current standard of care in the industry, the standards of the Structural Engineers Association of California, and the latest edition of the Uniform Building Code (which specifies a seismic design to withstand an earthquake event that has a 10 percent probability of exceedence in 50 years).

Drainage improvements at the top of the bluff would further reduce the potential for large-scale landsliding and surface erosion by reducing the amount of water that would be allowed to infiltrate into the subsurface materials and would be allowed to flow out over the top of the bluff.

The majority of short-term and long-term effects are not considered significant. However, the following effects may be considered significant:

- long-term loss of beach width (due to fixing the back of the beach), or passive erosion;
- end-scour effects of the bluff protection wall; and
- erosion of tidal terrace.

2.1.3 Mitigation, Monitoring, and Reporting Program

As discussed in Section 4.2, the project’s cumulative impact related to passive erosion and tidal terrace would remain significant and would not be able to be mitigated.

End-scour effects can be mitigated below a level of significance with implementation of the following mitigation measure:

GEO-1: Prior to grading permit issuance, the bluff protection wall plans shall be reviewed and approved by the Engineering Services Department to ensure that uniformly applied engineering standards are implemented to prevent end scour effects associated with the bluff protection wall.

Direct passive erosion and tidal terrace erosion effects at the project site can be mitigated below a level of significance with implementation of the following mitigation measure:

GEO-2: The Parks and Recreation Department shall provide annual sand replenishment at the project site on an as-needed basis when eight feet or more of the shoreline protection structure is exposed. Sufficient sand shall be imported so that three to four feet of the shoreline protection structure would be exposed and the maximum grade of imported fill within the beach area shall be 5:1. The beach replenishment should occur prior to Memorial Day. The procedure used to replenish sand shall be in accordance with a Coastal Development Permit issued by the California Coastal Commission.

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2.2 VISUAL/AESTHETICS

This section evaluates the visual and aesthetic impacts of various components of the Beacon's Beach Access Project, including the slope regrading, parking lot reconfiguration, bluff protection wall installation, and other various proposed project elements that have the potential for changing the visual environment. This section, based on the Visual Technical Study conducted by KTU+A (2004) for the project, identifies the existing visual character of the study area, determines the visibility of project elements, and quantifies the potential viewers that would see these elements. This section also analyzes visual impacts and describes the consideration given to design quality in planning various project components and mitigation.

2.2.1 Methodology

The methodology used for this visual quality study included the evaluation of the visual environment by describing the resources and character of the area and the potential viewer response to changes in that visual environment. Field inspection and photography were used in the analysis of visual resources. Visual character units were mapped to describe areas of similar character and sensitivity to change. The assessment of viewer characteristics was based on an evaluation of typical viewer location, activity, and values. Visual simulations of the project were prepared to assist in the evaluation of the degree of change. A determination as to the adversity of visual changes was made. Methods to mitigate adverse visual impacts were also developed. Definitions of visual quality terms are provided in Appendix A.

2.2.2 Environmental Setting

Unlike most environmental impacts (except noise), visual impacts can extend beyond the physically disturbed areas of a project. The visual setting can also involve items that are not physical, but can be either perceptual or a community policy-based item that may result in a physical and visual change in the environment.

2.2.3 Regulatory Setting

2.2.3.1 State California Environmental Quality Act Guidelines

California Environmental Quality Act (CEQA) Section 15064 (b) states "…the significance of an activity may vary with the setting … an activity which may not be significant in an urban area may be significant in a rural area." This statement is particularly applicable to the determination of the significance of a visual effect.

2.2.3.2 Professional Guidelines

Guidelines developed by the Association of Environmental Planners and the American Society of Landscape Architects identify visual impacts as those project features that would block public views from designated open space, roads, or parks to significant visual landmarks or scenic vistas (the ocean, downtown skylines, mountains, waterways, wide open distant views, etc.). To meet this significance threshold, one or more of the following conditions would apply:

- The project would substantially block a public view through a designated public view corridor as shown in an adopted community plan, the general plan, or the local coastal program. Minor view blockages would not be considered to meet this condition.

- The project would cause substantial view blockage of a public resource (such as the ocean) that is considered significant by the applicable community plan.

- The project would exceed the allowed height or bulk regulations, which would cause unnecessary view blockage.

- The project would have a cumulative effect by opening up a new area for development, which would ultimately cause extensive view blockage.

2.2.3.3 Local Regulatory Guidelines and Ordinances

The governing documents related to visual issues in the coastal region of the City of Encinitas include the City's General Plan, the Local Coastal Program, the Municipal Code, and special overlay zones.

2.2.3.3.1 City of Encinitas General Plan

- Policy 8.5: The City will encourage the retention of the coastal bluffs in their natural state to minimize the geologic hazard and as a scenic resource. Construction of structures for bluff protection shall only be permitted when an existing principal structure is endangered and no other means of protection of that structure is possible. Only shoreline/bluff structures that will not further endanger adjacent properties shall be permitted as further defined by City coastal bluff regulations. Shoreline protective works, when approved, shall be aligned to minimize encroachment onto sandy beaches. Beach materials shall not be used as backfill material where retaining structures are approved (Coastal Act/30235/30240/30251/30253).

- Resource Element Goals: Community Views, Vistas, and Aesthetic Qualities are part of GOAL 4 in the Resource Element. The City, with the assistance of the state, federal, and regional agencies, shall provide the maximum visual access to coastal and inland views through the acquisition and development of a system of coastal and inland vista points (Coastal Act/30251).

2.2.3.3.2 Coastal Bluff Overlay Zone

The project site falls within one of the special overlay zones as part of Chapter 30.34 in the Municipal Code. The Coastal Bluff Overlay Zone regulations apply to all areas of the City where site-specific analysis of the characteristics of a parcel of land indicate the presence of a coastal bluff. The sections below are paraphrased from the regulations found in Chapter 30.34. Only those sections relevant to this project have been included.

B. Development Standards

In addition to development and design regulations, which otherwise apply, the following development standards shall apply to properties within the Coastal Bluff Overlay Zone. In case of conflict between the following standards and other standards, regulations, and guidelines applicable to a given property, the more restrictive shall regulate (Ordinance 91-19).

1. With the following exceptions, no principal structure, accessory structure, facility, or improvement shall be constructed, placed, or installed within 40 feet of the top edge of the coastal bluff. Exceptions relative to the project are:

   b. Minor accessory structures and improvements located at grade, including landscaping, shall be allowed to within 5 feet of the top edge of the coastal bluff. Precautions must be taken when placing structures close to the bluff edge to ensure that the integrity of the bluff is not threatened.

   c. Essential public improvements providing coastal access, protecting natural resources, or providing for public safety, including, but not limited to, walkways leading to approved public beach access facilities, open fences for safety or resource protection, public seating benches, lighting standards, and signs (Ordinance 91-19) 06-95 30.34.020B.

   d. Drainage improvements within 5 feet of the top edge of coastal bluff as required to satisfy Section 30.34.020(B)5 of this Code (Ordinance 91-19).

2. With the following exceptions, no structure, facility, improvement, or activity shall be allowed on the face or at the base of a coastal bluff. Exceptions are:

   a. Public beach access facilities.

   b. Preemptive measures, as defined, justified, and approved pursuant to paragraph C Development Processing and Approval (Ordinance 91-19).

6. Landscaping on beach bluff properties shall avoid the use of ice plant, and emphasize native and drought-tolerant plants in order to minimize irrigation requirements and reduce potential slide hazards due to over-watering. Landscaping materials shall be installed and maintained so as to assure that neither during growing stages nor upon reaching maturity will such materials obstruct views to and along the ocean and other scenic coastal areas from public vantage points. Irrigation shall be limited to hose bibs or water-saving irrigation systems with automatic timers. No permanent irrigation system shall be permitted within 40 feet of the coastal bluff edge (Ordinance 95-04).

7. Buildings and other structures shall be sited, designed, and constructed so as not to obstruct views to and along the ocean and other scenic coastal areas from public vantage points.

8. The design and exterior appearance of buildings and other structures visible from public vantage points shall be compatible with the scale and character of the surrounding development and protective of the natural scenic qualities of the bluffs.

When a preemptive measure is proposed, the following findings shall be made if the authorized agency determines to grant approval (Ordinance 91-19):

(4) The proposed measure in design and appearance must be found to be visually compatible with the character of the surrounding area; where feasible, to restore and enhance visual quality in visually degraded areas; and not cause a significant alteration of the natural character of the bluff face.

2.2.3.3.3 Scenic/Visual Corridor Overlay Zone

The Coastal Act calls for the identification and preservation of significant viewsheds within the coastal zone. Section 30251 of the Coastal Act states that "the scenic and visual qualities of the coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas..." According to the past actions and precedents set by the California Coastal Commission, the primary concern of this section of the Coastal Act is the protection of ocean and coastal views from public areas (highways, parks, beach-access ways, viewpoints, etc.).

A. Applicability: The Scenic/Visual Corridor Overlay Zone regulations shall apply to all properties within the Scenic View Corridor as described in the Visual Resource Sensitivity Map of the Resource Management Element of the General Plan.

B. Development Standards: When development is proposed on any properties within the Scenic View Corridor, consideration will be given to the overall visual impact of the proposed project and conditions or limitations on project bulk, mass, height, architectural design, grading, and other visual factors may be applied to Design Review approval.

2.2.3.3.4 Bluff Preemptive Measure Appearance Policy

Put into effect by Council Resolutions 2002-04, the Bluff Preemptive Measure Appearance Policy was designed to control the appearance of structures put into place to preemptively address slope stability and receding shorelines. The primary focus of the policy is to assure that structures added in this highly visible/high visual quality setting appear to be natural features that are consistent and compatible with the adjacent natural bluff in both color and form.

This ordinance requires that an architectural/visual study be submitted concurrent with the submittal of a major use permit. Theses studies are required to include discussion and illustrations of ways to minimize bluff preemptive measures having an unnatural, manufactured appearance. Specifically, such projects will:

- simulate the natural surface characteristics of the adjacent geologic formation(s), including texture, color variations, and random surface topography;
- minimize straight tops;
- minimize lines and seams between pours and form joints; and
- minimize repetitive surface patterns.

Landscaping may be required for erosion control, to achieve bluff stabilization, and to minimize visual impacts. All plant material would have the ability to naturalize without supplemental irrigation water after an establishment period of three years or fewer.

2.2.4 Visual Character Units Adjacent to the Study Area

An important first step in determining the visual setting is the classification of adjacent lands into one of several visual character units. Since an impact on a specific site is somewhat determined by the adjacent visual setting, it is important to classify the areas surrounding the project site. Each of the character units described on Figure 2.2-1 has similar, interrelated physical and visual elements. Photos of each character unit have been provided to illustrate the context. These character units are shown on Figures 2.2-2 and 2.2-3.

Often, topography and other urban forms determine the limits of each visual character unit. The level of conformity and arrangement of elements can also determine the limits of each area. Table 2.2-1 shows the ranking of the existing visual quality of each character unit and indicates the relative sensitivity to change that may occur in each area. Generally, an area with a great deal of conformity and visual organization tends to be sensitive to change, since most changes will contrast with the existing elements. On the other hand, some areas that have a great deal of diversity, or have elements that detract from the overall visual organization, tend to be able to absorb changes without most viewers noticing the change.

Table 2.2-1: Existing Visual Character Units

Visual Character Unit		Visual Quality	Visual Sensitivity
1a	Project site parking lot	Low	Low
1b	Project site slope	Low	Moderate
2	Beach	High	High
3	North eroded adjacent bluff	Low	Moderate
4	North bluff with retaining walls	Moderate	High
5	Adjacent neighborhood	Moderate	High
6	South eroded adjacent bluff	Low	Moderate
7	South bluff with retaining walls	Low	Moderate
8	South bluff slope failure/beach erosion deposit	Low	Moderate
9	South revegetated bluff	Moderate	High

2.2.4.1 Public Views

There are three defined parts of views: the viewing scene (in this case the view of the ocean, beach, coastal bluffs, and manmade elements on these bluffs); the viewing location from where the viewer sees the viewing scene; and the view corridor, which is the volume of space between the viewing scene and the viewing location.

The viewing scene from the project site is considered to be regionally significant, available to the public, and of a high visual quality. The actual views are depicted on Figure 2.2-4 and are keyed on Figure 2.2-1. Some of the views are seen from the public beach or the water itself (see Photo 1 on Figure 2.2-4). Some of the views are seen from the upper lot (see Photos 2, 3, and 4 on Figure 2.2-4) and others are seen from the public trail that runs from the upper lot to the beach (see Photos 5 and 6 on Figure 2.2-4).

The viewing corridors that support the views seen from the site are not likely to be blocked based on any of the project's proposed elements.

The location where people stand to see the views would not be negatively changed based on the proposed project elements. Because a larger area for viewing and a more open and lower railing system are proposed as part of the project, the project would improve the ability to see the viewing scene.

2.2.4.2 Visual Elements of Adjacent Areas

The major visual elements that make up the character of the adjacent site are generally related to natural landforms and outcrops. Rock outcrops and bluff forms have been summarized on Figure 2.2-5. Photos of walls are shown on Figures 2.2-6 and 2.2-7. Refer to Figure 2.2-1 for the locations of these photos.

Both variety and uniformity exist between these natural outcrops. The color, texture, form, and line of these bluffs are consistent and should be repeated on any bluff protection wall that is intended to look like the adjacent outcrops. Photos E and F on Figure 2.2-5 and Photo G on Figure 2.2-6 show newer sediment deposits and may or may not be appropriate for incorporating into new designs. The triangular forms and angular lines and fissures are appropriate to repeat. Striations and horizontal bands of slight changes in color should also be repeated. Some undercutting of slopes has occurred and is part of the natural form of the area. Interspersing of some vegetation that drapes down the face of the bluffs is also appropriate.

A review of the bluff protection walls in the adjacent area does not yield many samples for repeating. None of the adjacent walls meets the Bluff Preemptive Measure Appearance Policy since none is natural in appearance or matches local forms of the bluff. Photos A, B and C on Figure 2.2-6 may be the least contrasting because of their non-flat wall forms and texture. Though these walls are the least contrasting, a great deal more could have been done to blend the appearance to the adjacent bluffs. The remaining walls D through J on Figures 2.2-6 and 2.2-7 are out of scale, the wrong color, have mostly all manmade forms, and do little to fit into the context of the natural slopes.

Figure 2.2-1: Visual Character Units & Photographic Locations

[INSERT COLOR FIGURE]

Figure 2.2-2: Visual Character Units Photographs 1A – 3

[INSERT COLOR FIGURE]

Figure 2.2-3: Visual Character Units Photographs 4 – 9

[INSERT COLOR FIGURE]

Figure 2.2-4: Views – Photographs 1 – 6

[INSERT COLOR FIGURE]

Figure 2.2-5: Typical Adjacent Visual Elements Rock Photographs A – F

[INSERT COLOR FIGURE]

Figure 2.2-6: Typical Adjacent Visual Elements Rock Photograph G/ Wall Photographs A – E

[INSERT COLOR FIGURE]

Figure 2.2-7: Typical Adjacent Visual Elements Wall Photographs F – K

[INSERT COLOR FIGURE]

2.2.4.3 Visual Elements of the Project Site

The major elements that make up the character of the project site are shown on Figure 2.2-8. Figure 2.2-9 shows the locations from where these on-site photos were taken. Beyond the design of the Beacon's Beach sign shown in Photo a, most of the elements of the site are considered to have a low overall visual quality. The setting in the backdrop of the project site, on the other hand, is so dramatically vivid and uniform that it generally takes the attention away from the viewer so that the viewer does not notice the poor condition of the site. Much of the project site is in disrepair, including leaning posts, worn and cracked woodwork, and concrete and asphalt. In general, the upper project site is considered to have a low visual quality and changes in this environment would not be likely to contrast dramatically with the existing setting. This makes the upper portion of the site more able to absorb changes in setting without being negatively perceived. The slope and beach area of the site are also in ill repair with exposed pipe, extensive weeds and other non-native brush, and a high percentage of eroded and rilled slopes.

2.2.4.4 Viewer Exposure and Sensitivity

Various viewer groups have been identified that share similar outlooks and activities. The viewer groups that can see one or more parts of the project are shown on Table 2.2-2.

In general, the viewer group with the highest sensitivity to view-quality impacts is that of the residential owner. Residents have the longest exposure to the view and, as property owners, they have a vested interest in and great concern regarding impacts to their investment.

Table 2.2-2: Viewer Group Summary

Viewer Group	Group	Quantity	Distance	Views	Sensitivity	Viewing Duration
Adjacent residential owner	A	Moderate	Middle-ground	Slope and upper lot	High	12 to 14 hours daily
Adjacent residential renter	B	Moderate	Middle-ground	Slope and upper lot	Moderate	12 to 14 hours daily
Local roadway drivers	C	Moderate	Fore-ground	Upper lot improvements	Moderate	A few seconds
Public viewer from upper lot	D	High	Fore-ground	Upper lot, slope, and lower lot elements	High	15 to 30 minutes
Trail or beach user/walker	E	Moderate	Fore-ground	Slope, trail, and wall	High	1 to 4 hours
Swimmer/surfer	F	Moderate	Middle-ground	Slope, trail, and wall	High	1 to 4 hours

Figure 2.2-8: On-Site Features Photographs A – F

[INSERT COLOR FIGURE]

Figure 2.2-9: Key View Photograph Locations

[INSERT COLOR FIGURE]

Another sensitive-viewer group is the recreational user that utilizes the beach or water, or simply enjoys the view. The goal of these viewers is to specifically view or utilize the natural resources of the area. Recreational users have the closest view of the project elements.

Roadway drivers are typically concerned with changes in the visual environment, and those driving for scenic interest are the most concerned. Viewers commuting for work-related purposes are generally less concerned.

Viewer sensitivity is related to viewer activity, awareness, and values. A person driving in heavy traffic will have a different perspective than a person driving for pleasure or relaxing in scenic surroundings. The receptivity of a viewer to his/her surroundings can be affected by the scene itself.

2.2.4.5 Viewer Response

Viewers who frequent the upper and lower portions of Beacon’s Beach are likely to have the highest sensitivity to change. The number of recreational viewers using the park, its trails, beach, or ocean resources, is unknown but is likely significant. This group will be sensitive to how their regionally significant view (the lower beach, ocean, and distant coastal views) would be affected by the project elements.

Residents in the homes to the north and south of Beacon’s Beach would also be highly sensitive to change, although they are relatively few in number. Residents of both locations are positioned above the project where they have an overview, making any changes very apparent.

2.2.4.6 Visually Prominent Project Elements Described

Noticeable changes in the physical environment resulting from the project include the reconfiguration of the parking lot, wider public sidewalks, the new replacement railing system (at the top and down the trail), the regraded slope (including the removal of rills, eroded slopes, and pipes on grade), a bluff protection wall at the toe of the slope, a lifeguard tower, and new vegetation on all slope areas.

2.2.4.7 Candidate Key Views

The views of the project site as seen from each character unit were analyzed to determine where the changes in the visual environment would be both noticeable and prominent. Key views in each adjacent character unit were selected to be as representative as possible, as seen by the dominant viewer group of that unit. These views are considered to be candidate key views and are listed in Table 2.2-3. The locations of these candidate key views are mapped on Figure 2.2-9.

After evaluating the candidate key views and analyzing the probable changes, the viewer groups, the viewing duration, and the viewer sensitivity, Candidate Key Views 20, 21, and 22 were selected for the production of visual simulations (see Table 2.2-3).

Table 2.2-3: Candidate Key Views

Key View	Character Unit	Dominant Viewer Group	Distance from Viewer to Project Site	Notes	Recommended for Simulations
1	1a	Public viewer from upper lot	Foreground	Does not show enough of the slope	No
2	1a	Adjacent residential owner	Middleground	Shows the slope but not enough of the upper lot	No
3	1a	Public viewer from upper lot	Foreground	Good balance between upper and lower project elements	Possible backup
4	1a	Public viewer from upper lot	Foreground	No view of the lower slopes	No
5	1a	Trail or beach user/walker	Foreground	Good combination of upper and lower project elements	Possible backup
6	1a	Trail or beach user/walker	Foreground	Would not see bluff protection wall. Angle too much downhill	No
7	1a	Trail or beach user/walker	Foreground	Would not see bluff protection wall. Angle too much downhill	No
8	1a	Trail or beach user/walker	Foreground	Would not see bluff protection wall. Angle too much uphill	No
9	2	Trail or beach user/walker	Foreground	Would see the bluff protection wall well but not enough of the middle slope area	No
10	2	Trail or beach user/walker	Middleground	Would see the bluff protection wall and middle slope area well	Possible backup
11	2	Trail or beach user/walker	Middleground	Would see the bluff protection wall and middle slope area but photo is too far to the north	No

Table 2.2-3 (Concluded)

Key View	Character Unit	Dominant Viewer Group	Distance from Viewer to Project Site	Notes	Recommended for Simulations
12	2	Trail or beach user/walker	Middleground	Would see the bluff protection wall and middle slope area but photo is too far to the south	No
13	Not applicable	Trail or beach user/walker	Background	Too focused on slopes	No
14	2	Trail or beach user/walker	Middleground	Would see the bluff protection wall but photo is too far to the north for most project elements	Possible backup
15	2	Trail or beach user/walker	Middleground	Too focused on slopes	No
16	2	Trail or beach user/walker/surfer	Middleground	Too focused on slopes	No
17	2	Trail or beach user/walker	Middleground	Too focused on slopes	No
18	2	Trail or beach user/walker	Middleground	Too focused on slopes	No
19	2	Trail or beach user/walker	Middleground	Shadows too long	No
20	1a	Public viewer from upper lot and adjacent residential owner	Foreground	Best balance between upper and lower project improvements and representative of adjacent property viewers	Yes, as simulation #1
21	2	Trail or beach user/walker/surfer	Background	Distant enough photo that shows all project elements in the simulation	Yes, as simulation #2
22	2	Trail or beach user/walker	Middleground	Best close-up view of the proposed bluff protection wall and representative of beach users and walkers	Yes, as simulation #2

Note: See Figure 2.2-2 for location of candidate key views

2.2.5 Environmental Impacts

2.2.5.1 Significance Criteria

The project would result in significant environmental impacts to visual quality if the project would:

- have a substantial adverse effect on a scenic vista by changing elements that are part of a viewing scene, including landform, vegetation, rock outcrops, and other natural forms and materials;
- substantially degrade the existing visual character or quality of the site or its surroundings;
- create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area;
- substantially block a view through a designated public view corridor as shown in an adopted community plan, the general plan, or local coastal program;
- cause substantial view blockage of public resources that are considered significant by the applicable community plan;
- exceed the allowed height or bulk regulation and existing patterns of development in the surrounding area by a significant margin;
- have an architectural style or use building materials in stark contrast to adjacent development where the adjacent development follows a single or common architectural theme;
- result in the physical loss, isolation, or degradation of a community identification symbol or landmark that is identified in the general plan, applicable community plan, or local coastal program;
- be located in a highly visible area and would strongly contrast with the surrounding development or natural topography through excessive bulk, signage, or architectural projections;
- have a cumulative effect by opening up a new area for development or changing the overall character of the area;
- create a cluttered and distracting appearance and substantially conflict with City codes; and/or
- include crib, retaining, or noise walls greater than 6 feet in height and 50 feet in length with minimal landscape screening or berming where the walls would be visible to the public.

2.2.5.1.1 Methodology

The visual impacts of the project were determined by assessing the visual resource change due to the project and predicting viewer response to that change. The resulting level of visual impact was determined by combining the severity of resource change with the degree to which people are likely to oppose or feel negative about the change. Visual impact levels are defined below.

- Potential Improvement: No adverse change in visual quality would be caused by the project; however, the project is likely to include a change to the visual environment that is positive as perceived by the majority of potential viewers. This category of impact does not require mitigation nor does it need any further discussion.

- None or Not Applicable: No adverse change in visual quality would be caused by the project. This category may also include a designation of not applicable where the impact category does not relate to any of the project elements. This category of impact does not require mitigation, nor does it require any further discussion.

- Low: Minor adverse change in visual quality caused by the project that only slightly affects visual resources, and/or the viewers are not sensitive to the change, and/or the viewers are at a great distance from the change. This category of impact does not require mitigation and is not considered to be significant under CEQA threshold guidelines. This impact category does not need any further discussion.

- Moderate: Moderate adverse change in visual quality caused by the project that can be mitigated by conventional practices. Viewer response level is moderately negative. Viewer quantities are generally high as well. This impact category is considered to be significant under CEQA threshold guidelines. Mitigation is required, or adjustments to the project are necessary to reduce significant impacts.

- High: A high level of adverse change to the resource can be expected and most project treatments and/or design adjustments would not be able to mitigate this impact. Viewer quantities are high. Viewer response level is highly negative. An alternative project design may be required or an unmitigatible impact may result. A highly adverse impact is considered significant under CEQA and would require formal mitigation, and unless it can be mitigated to less than significant levels would be considered a significant adverse impact.

2.2.5.2 Impact Assessment

Previously developed visual simulations are shown on Figures 2.2-10 and 2.2-11. These simulations were created primarily for design verification and public communication purposes, and they lend themselves to review of visual impacts and provide for a better understanding of the project. However, Simulation A on Figure 2.2-10 would not be seen by any viewer group since the simulation was prepared with a key view location floating above the site. Simulation B on Figure 2.2-10 provides a simulation that can potentially be seen by beach swimmers and surfers and is taken from an appropriate angle based on viewer location. Simulation C on Figure 2.2-11 gives an overview of the views and project elements as seen from the upper parking lot.

Figure 2.2-10: Previous Photo Simulations

[INSERT COLOR FIGURE]

Figure 2.2-11: Previous Photo Simulations

[INSERT COLOR FIGURE]

The key view is located above any viewer group's view of the project, but is within a reasonable height to assess impacts. In all cases, the height of the bluff protection wall is de-emphasized due to the oblique nature of the simulations. Simulation B provides a good angle to assess the bluff protection wall.

The visual simulations have been prepared to test the amount of contrast that the project elements would have with the visual environment and the affect it would have on existing visual resources and views. The right side of each simulation also includes descriptions of the project elements and an overall rating of the existing quality and character of the site. A summary of the expected contrasts is presented in the right column.

Visual Simulations #1 (see Figure 2.2-12) focuses on the upper parking lot and the transition down the slope to the top of the bluff protection wall. The bluff protection wall and trail do not contrast or seem out of character with the visual setting. This simulation also includes the proposed slope revegetation plan as described on the Landscape Plan (refer to Figure 1.4-3). The upper elements all demonstrate an improved visual environment that is compatible with the rustic character of the area.

The overall visual quality and character is not affected by the proposed project as shown by Visual Simulations #1. The vividness, intactness, unity, and visual organization are not impacted and in most situations, are improved. Views are not affected by the project; instead, opportunities for public views are enhanced. The more refined nature of the railing system may be perceived by some as being modern rather than rustic; however, the proposed building materials and the forms of the railing are compatible with the setting. The native plant materials proposed for the bluff would reduce the current contrast with adjacent slopes and result in a more natural appearance of the bluff face. From this simulation perspective, contrasts are slight or positive.

Visual Simulations #2 (see Figure 2.2-13) was developed to test the beach-level, middleground view of the lower portions of the project. This view also shows how the more intensive rail system may affect the look of the trail from a distance. This simulation indicates a problem with the bluff protection wall. Whereas Simulation B on Figure 2.2-10 makes the bluff protection wall look natural and integrated into the slope, a slight side view of the bluff protection wall indicates that the flat top of the bluff protection wall stands out as unnatural. Also, Simulation B assumes that an irregular shadow pattern with ins and outs and naturally formed rock outcropping shapes would be accomplished by the project. With the proposed mitigation measures listed in this document, the inclusion of features that breakup the angular and linear appearance of the bluff protection wall would soften the visual impact of this structure.

The overall visual quality and character is not affected as shown by Visual Simulations #2. The vividness, intactness, unity, and visual organization are not impacted and in most situations, are improved. Views are not affected by the project. The proposed bluff protection wall may have a negative effect on the community character of the lower portions of the site.

Figure 2.2-12: Visual Simulations #1

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Figure 2.2-13: Visual Simulations #2

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Visual Simulations #3 (see Figure 2.2-14) was generated to test the foreground proximity of viewers with the proposed elements, and it provides a better look at the proposed lifeguard tower. This simulation also indicates a small problem with the bluff protection wall. Again, the flat-top nature of the bluff protection wall may contrast with the varying landforms and patterns in the area. The meandering of the bluff protection wall does help to lessen the impact of a flat top wall, however.

The overall visual quality and character is not affected as shown by Visual Simulations #3. The vividness, intactness, unity, and visual organization are not impacted and in most situations, are improved. Views are not affected by the project. As was the case in Visual Simulations #2, the proposed bluff protection wall may have a negative effect on the community character of the lower portions of the site.

2.2.5.2.1 Issues and Criteria Used to Determine Significant Impacts

Table 2.2-4 analyzes the possible impacts associated with several categories of the physical elements of the project. Issues reviewed for this project regarding visual resources are described below.

Table 2.2-4: Summary of Impacts Per Project Element

Impact Issue Area	**Parking Lot/Plaza Areas**	**Edge Railing Near Parking Lot**	**Slope, Including Trail and Railing**	**Lifeguard Tower/ Shower Area**	**Bluff Protection Wall and Misc. Stairs**	**Misc. Structures / Utilities**
1. Aesthetics						
a) Change Quality of Current Scenic Area	**N**	**N**	**N**	**N**	**N**	**N**
b) Degrade Visual Character	**P**	**P**	**P**	**N**	**M**	**N**
2. Views						
a) Block a View Corridor	**N**	**N**	**N**	**N**	**N**	**N**
b) Block a View of Public Resource	**N**	**N**	**N**	**N**	**N**	**N**
3. Neighborhood Character						
a) Exceed Bulk & Height of Adjacent Area	**N**	**N**	**N**	**N**	**N**	**N**

Table 2.2-4 (Concluded)

Impact Issue Area	**Parking Lot/Plaza Areas**	**Edge Railing Near Parking Lot**	**Slope, Including Trail and Railing**	**Lifeguard Tower/ Shower Area**	**Bluff Protection Wall and Misc. Stairs**	**Misc. Structures/ Utilities**
b) Stark Contrast with Area Bldg. Materials or Style	**N**	**N**	**N**	**N**	**N**	**N**
c) Result in Loss of Community Landmark	**N**	**N**	**N**	**N**	**N**	**N**
d) Strongly Contrast with Adjacent Development	**P**	**P**	**P**	**N**	**M**	**N**
e) Have a Cumulative Effect on Overall Character	**P**	**P**	**P**	**N**	**N**	**N**
4. Development Feature						
a) Create a Cluttered Appearance	**P**	**P**	**P**	**N**	**N**	**N**
b) Major Walls that Contrast with the Visual Character of the Area	**N**	**N**	**N**	**N**	**M**	**N**

P = Positive Improvement; N = No Impact or Not Applicable; L = Low Adverse; M = Moderate Adverse; H = High Adverse

Issue 1. Aesthetics

Would the project:

(a) have a substantial adverse effect on a scenic vista by changing elements that are part of a viewing scene, including landform, vegetation, rock outcrops, and other natural forms and materials?

Figure 2.2-14: Visual Simulations #3

[INSERT COLOR 11X17 FIGURE]

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The current degraded character of the project area indicates that a potential improvement or no impact would occur. The current site contains extensive eroded slopes, invasive species, sediment transported and piled, on-grade surface stormwater piping, exposed plastic liners, and erosion control matting. All of these elements are visible and all would be improved by the project. Also, the project site is not a substantial or dominating part of the visual scene along the coastline. Major built structures on either side of the park tend to bring down the visual harmony and intactness of this portion of the coastline.

(b) substantially degrade the existing visual character or quality of the site or its surroundings?

No impact or a positive impact would occur. An exception would be that the proposed bluff protection wall could have a moderately adverse impact on the visual character and quality of the site when constructed. This moderately adverse impact can be mitigated by greater variation in the height of the wall and more variation in the rock detailing to match the existing rock formations and colors of naturally occurring rock in the area. During construction, the visual quality of the site would be degraded because the equipment and activity would be noticeable to beachgoers and residents; however, this is a short-term impact and is not considered significant.

Issue 2. Views

Would the project:

(a) substantially block a view through a designated public view corridor as shown in an adopted Community Plan, the General Plan, or Local Coastal Program?

A substantial and regionally important public view exists at the project site. These views are listed in the City’s General Plan and Local Coastal Program. However, none of the proposed project elements would interfere with the public view corridor. As is the case with other visual issues, the project is likely to increase the ability for the public to enjoy the view. No impact or a positive impact would occur.

(b) cause substantial view blockage of public resources that are considered significant by the applicable Community Plan?

Similar to Issue 2(a), no impact or a positive impact would occur.

Issue 3. Neighborhood Character

Would the project:

(a) *exceed the allowed height or bulk regulation and existing patterns of development in the surrounding area by a significant margin?*

The lifeguard tower is the only building proposed. The tower would be at the base of the slope, would not be of substantial size, and would not exceed the massing of adjacent residential structures. No impact would occur.

(b) *have an architectural style or use building materials in stark contrast to adjacent development where the adjacent development follows a single or common architectural theme?*

No consistent building material exists in the area. A variety of styles and materials are used. The project proposes a wood rail system that would be compatible in scale and materials to most of the adjacent structures. No impact would occur.

(c) *result in the physical loss, isolation, or degradation of a community identification symbol or landmark, which is identified in the General Plan, applicable Community Plan, or Local Coastal Program?*

No major local symbols or landmarks would be affected by any of the project alternatives. The only on-site landmark is the existing wood Beacon's Beach sign that would remain in place. No impact would occur.

(d) *be located in a highly visible area and strongly contrast with the surrounding development or natural topography through excessive bulk, signage, or architectural projections?*

The site and the proposed elements are within a highly visible area. The number of viewers is substantial and those viewers would be sensitive to changes in the visual environment. The project, however, would not dramatically contrast with the current visual setting. Though extensive grading would be completed by this project, the proposed slope and the existing slope are similar. The new graded slope would look more natural than the existing slope and would remove the extensive erosion that has occurred on the project site as well as the aboveground drainage pipes and temporary erosion control plastic. The proposed signage would be noticeable to the public but would not be of a size or orientation that would be considered incompatible with the adjacent neighborhood. The only architectural treatment would be that of the lifeguard tower and platform, which are well within the bulk average of the adjacent properties. For the project elements listed above, no impact would occur.

The proposed bluff protection wall would have the potential for significant negative visual impact on the natural setting of the beach and slope areas. However, given the proposed project design (form, color, texture) and the relative scale of the wall compared to adjacent bluff protection walls, the bluff protection wall is not likely to have a significant impact on the visual quality of the site. Based on the current details of the wall, including a relatively horizontal top of the wall, it would contrast with the natural landforms, rock outcrops, and bluffs of the area. A moderately adverse impact is assigned to the bluff protection wall.

(e) *have a cumulative effect by opening up a new area for development or changing the overall character of the area?*

The project would not encourage, facilitate, or accommodate any future development; therefore, no impact would occur. However, the project, in conjunction with past, present, and future bluff protection walls in the Leucadia area, would result in an incremental visual impact that is cumulatively considerable. See Chapter 4—Cumulative Impacts for further discussion of cumulative impacts.

Issue 4. Development Features

Would the project:

(a) *create a cluttered and distracting appearance and substantially conflict with City codes?*

The project would be consistent with all General Plan, Local Coastal Program, Resource Element, Special Overlay Zones, and other ordinances. It would not create a cluttered or distracting appearance. No impact or a positive impact would occur.

(b) *include crib, retaining, or noise walls greater than six feet in height and 50 feet in length with minimal landscape screening or berming where the walls would be visible to the public?*

The project would include the construction of a bluff protection wall that would vary from 3 feet to 8 feet in height above the variable sand level. The variation at the base of the bluff protection wall would depend on the dynamics of sand transport during major storm events. Most of the bluff protection wall most of the time is likely to be exposed between 3 and 8 feet in height because a sand replenishment program is proposed by the City as part of the project (see Section 1.4.2). During the winter and storm conditions, this analysis assumes that approximately 4 to 8 feet of the bluff protection wall may be exposed. Based on the visibility of the wall, the location of the wall in a scenic area, the current policies and regulations affecting bluff protection walls, the number of viewers and their sensitivity to change, and the proposed project design, moderately adverse impact is assigned to the wall. Mitigation measures discussed in Section 2.2.6 Mitigation Measures would reduce this impact to less than significant levels.

2.2.5.3 Summary of Significant Effects

The proposed bluff protection wall is the only project feature considered to cause a moderately adverse impact.

2.2.6 Mitigation, Monitoring, and Reporting Program

Utilizing the methodology developed for analyzing visual quality impacts described in Section 2.2.1, moderately and highly adverse impacts of the project are considered a level of significance requiring mitigation. A moderately adverse impact associated with the bluff protection wall would occur and can be mitigated to a low adverse impact level through mitigation measures. No highly adverse direct impacts are expected as a result of the project. However, as discussed in

Section 4.2, the project's cumulative impact on visual quality would remain significant and unable to be mitigated.

2.2.6.1 Issue 1a. Aesthetics

The proposed bluff protection wall would result in a moderately adverse impact on the visual character of the site. However, only a low impact on visual character would occur if the following mitigation measures are incorporated into the project:

VIS-1: Prior to grading permit issuance, the Engineering Services Department shall ensure that the following measures are provided on the bluff protection wall construction plans:

(a) The top of the bluff protection wall shall naturally undulate across its length.

(b) The incorporation of varied surface features that shall create a shadow line and variety to the surface of the wall must be included through the use of hand-sculpted shotcrete. The surface wall should vary as much as 1 to 2 feet outward and inward. The forms should match the adjacent bluffs and rock outcrops, similar to what is shown in Simulation B (Figure 2.2-10). The bluff protection wall shall simulate the natural surface characteristics of the adjacent geologic formations including texture, color variations, and random surface topography.

(c) The treatments listed above shall be provided from the top of the bluff protection wall to +5 feet above mean sea level.

(d) The Parks and Recreation Department shall provide annual sand replenishment at the project site on an as-needed basis when eight feet or more of the shoreline protection structure is exposed. Sufficient sand shall be imported so that three to four feet of the shoreline protection structure would be exposed and the maximum grade of imported fill within the beach area shall be 5:1. The beach replenishment should occur prior to Memorial Day. The procedure used to replenish sand shall be in accordance with a Coastal Development Permit issued by the California Coastal Commission.

2.2.6.2 Issue 3d. Neighborhood Character

The bluff protection wall would contrast with the natural topography and surrounding neighborhood character and would result in a moderately adverse impact on the visual character of the site. See Issue 1a for mitigation measures and impacts after mitigation. With the inclusion of these mitigation measures, the moderately adverse impact would be reduced to a low adversity.

2.2.6.3 Issue 4d. Development Features

The bluff protection wall is not completely within the goals and objectives of the resource element, the overlay zone, and the council resolution on the appearance of preemptive bluff protection walls because of the use of a bluff protection wall to stabilize the site. However, the proposed bluff protection wall design meets the aesthetic goals and policies of these documents as long as the mitigation measures stipulated in this section are implemented. See Issue 1a for mitigation measures and impacts after mitigation. With the inclusion of these mitigation measures, the moderately adverse impact would be reduced to a low adversity.

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2.3 WATER QUALITY

This section discusses those elements of the project that may have the potential to affect the water quality of runoff both on- and off-site.

2.3.1 Environmental Setting

2.3.1.1 Stormwater Runoff Setting

The current hydrological setting of the site varies little from what is proposed by the project. Asphalt parking lots, a concrete sidewalk, and a small plaza area are all impervious surfaces and create runoff that is collected in a number of storm drain inlets. The stormwater is collected and flows down the bluff face through a series of on-grade pipes. These pipes then discharge into the beach area. The current slope is somewhat degraded and erosion has occurred. Prior to the use of aboveground pipes and water collection, erosion was much more extensive. This was a result of water being drained over the top of the bluff and down the slope. The soil materials and angle of the slope contributed to extensive erosion. Much of the sedimentation has been deposited at the toe of the slope.

Adjacent properties do not drain onto the project site. A small amount of roadway drainage may occur from the crowning of the roadways adjacent to the site. For the most part, however, all on-site runoff comes from on-site impervious surfaces.

Based on field visits, special water quality control devices (sediment basins, in-line filters, oily-wastewater separators, trash racks, etc.) were not visible. Storm drain inlets are present in various locations in the parking lot. Some storm drain stenciling warnings not to dump in certain storm drains were found on-site. The current parking surface shows signs of oil and other petrochemical by-products coming from parked and circulating cars. Since the site is often used for quick observation of wave conditions and for watching sunsets, it is not uncommon to have cars parked that are idling. This results in a higher than normal level of oil drips, fuel leaks, radiator leaks, and air conditioning condensation leaks, as well as normal vehicle brake pad dust and tire rubber.

2.3.2 Regulatory Setting

2.3.2.1 Program History

The National Pollutant Discharge Elimination System (NPDES) permitting program was established under Section 402 of the Clean Water Act (CWA) of 1972. In 1987 the CWA was amended to require municipal stormwater dischargers to effectively prohibit non-stormwater discharges to their storm drain system and to implement controls to reduce pollutants in stormwater to the maximum extent practicable. On February 21, 2001, the Regional Water Quality Control Board (RWQCB), San Diego Region, issued an NPDES Permit (Order No. 2001-01, NPDES No. CAS0108758) to 20 jurisdictions (Copermittees) that make up San Diego County’s urbanized area. The basis of this permit was the determination by the RWQCB that: *“Urban runoff discharges from [storm drain systems] are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. As runoff flows* *over urban areas, it picks up harmful pollutants such as pathogens, sediment (resulting from human activities), fertilizers, pesticides, heavy metals, and petroleum products."*

2.3.2.2 Program Details

The RWQCB's Municipal Permit requires each Copermittee in the region to develop a Jurisdictional Urban Runoff Management Program (JURMP). The goal of the City of Encinitas' JURMP is to protect and improve the quality of urban runoff and stormwater in order to improve the water quality of the local waterbodies (Pacific Ocean and beaches of Encinitas, Batiquitos Lagoon, San Elijo Lagoon, Cottonwood Creek, Escondido Creek, and Encinitas Creek). To accomplish this goal, the City has established a Clean Water Program. Essential duties of the Clean Water Program include public education, inspecting, water monitoring, and enforcement activities related to compliance with the RWQCB's Municipal Permit. The goal of the Clean Water Program is to ensure our storm drain runoff does not pollute creeks and close beaches.

City staff performs inspections of commercial and industrial facilities to ensure business-related activities do not contribute to storm drain pollution. Clean Water Program staff monitor and test runoff water for common and priority pollutants, using the data to track and identify violators. Violators of the Encinitas Storm Water Ordinances are written formal correct work notices and, in some instances, cited and taken to court.

In addition, the City has regulations requiring new development projects and construction sites to control stormwater pollution. This includes adherence to the Best Management Practices Manual Part II, which requires construction stormwater quality control and postconstruction controls to treat stormwater runoff throughout the life of the project. Best Management Practices Manual Part I provides compliance guidance to engineers, developers and contractors, as well as existing businesses. During construction, contractors are required to comply with the City's updated Grading Ordinance, which requires erosion and sediment control measures as well as material management practices to prevent contaminants from reaching storm drains.

2.3.2.3 Watershed Activities

In addition to the JURMP, the Municipal Permit also requires that the City collaborate with other jurisdictions on a watershed level. A watershed is the area of land that drains to a common discharge point. Encinitas is in the Carlsbad Watershed along with seven other Copermittees, including the cities of Carlsbad, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego. These Copermittees have developed a Watershed Urban Runoff Management Program (WURMP) to collectively reduce pollutants in the waterbodies throughout the watershed. The WURMP describes the collaborative plans and efforts to reduce the impacts of urban activity on receiving water quality within the Carlsbad Watershed to the maximum extent practicable. As with the JURMP, an Annual Report is required by the RWQCB.

In an effort to improve the quality of water flowing into creeks and onto beaches, the City began another aggressive pollution abatement program by creating the Public Works NPDES Division. The NPDES Division works closely with the City's Clean Water Program and performs cleaning and maintenance activities on the City's stormwater conveyance systems. During the dry summer months, storm drain catch basins and pipes accumulate trash, debris, and other unwanted waste. Without this routine maintenance, unmanaged waste would flow into creeks and directly onto beaches.

2.3.3 Environmental Impacts

2.3.3.1 Significance Criteria

Impacts of the project on water quality would be considered significant if the project would:

- violate any water quality standards or waste discharge requirements;
- 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 that would result in substantial erosion or siltation on- or off-site;
- create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- otherwise substantially degrade water quality;

2.3.3.2 Impact Assessment

This section reviews the potential water quality impacts associated with runoff, erosion, and water discharge resulting from the project. The elements of the project that would have an effect on runoff include a new asphalt parking lot, new concrete pedestrian plaza, new concrete walkway, widened compacted earth trails, a permanent lifeguard stand platform, a public outside shower, and a bluff protection wall.

The project may result in significant water quality impacts during construction activity. These effects would be associated with the disturbance of soils during grading activity within the bluff and parking lot areas. Grading would occur primarily within the bluff area, resulting in approximately 2,235 cubic yards of excavated material and 6,713 cubic yards of fill. The graded areas along the bluff face would be subject to erosion during storm events. During renovation of the parking area, the potential also exists for erosion to occur when the parking area pavement is removed, exposing the underlying soils. Without erosion control measures in place during construction, significant erosion may occur on the project site.

Subsequent to project construction, long-term water quality impacts are not expected to be significant with project implementation. The proposed best management practices described in Section 1.4.1.2 would ensure that impervious areas would not result in significant water quality impacts. In addition, the total amount of impervious area at the project site would be reduced from existing conditions. As a result of moving the bluff edge eastward, the parking lot and paved areas would be 3,875 square feet less than current conditions and the number of parking spaces would be reduced from 24 to 17 public parking spaces. Surface water from the parking area would be collected by fossil filtered catch basins and piped underground to discharge at two points at beach level. Runoff from the slope areas would be collected in surface swales along the uphill side of the walkways and conveyed to the underground piping system carrying the parking lot runoff. It is anticipated that the discharge points would be at or near sand level on the beach, so that energy dissipation devices would not be required. The proposed grading and landscaping of the bluff, once planted and established, would result in beneficial water quality effects when compared to the current, partially vegetated and steeper slope conditions (see Figure 1.4-3: Grading Plan, and Figure 1.4-4: Landscape Plan). Therefore, the long-term water quality impacts of the project are not considered significant.

2.3.3.3 Summary of Significant Effects

The project has the potential to significantly impact water quality resulting from erosion at the bluff face and the parking lot area during construction activities.

2.3.4 Mitigation, Monitoring, and Reporting Program

Implementation of the following mitigation measure would reduce water quality impacts of the project to less than significant levels:

WQ-1: Prior to grading permit issuance, the project applicant shall file a Notice of Intent (NOI) with the State Regional Water Quality Control Board and a Storm Water Pollution Prevention Plan (SWPPP) shall be submitted to the Engineering Services Department for review and approval. The SWPPP shall provide an erosion control system that shall be designed to the satisfaction of the Engineering Services Department and installed on-site during all construction activity. The system shall prevent discharge of sediment and all other pollutants onto the beach. The City of Encinitas Best Management Practice Manual shall be employed to determine appropriate storm water pollution control practices and measures for the SWPPP during construction.

2.4 RECREATION

2.4.1 Environmental Setting

Beacon's Beach is one of six City-operated beaches and receives approximately 170,000 visitors annually. There are also two State beaches in the City: San Elijo State Beach and Cardiff State Beach. The locations of the City and State beaches are presented on Figure 2.4-1. Total annual beach attendance at City and State beaches along the Encinitas coast has been estimated at between 2.2 and 2.5 million visitors. A variety of recreation activities are available to users of Beacon's Beach, including:

- sunbathing,
- picnicking,
- beachcombing,
- sightseeing,
- surfing,
- surf fishing,
- swimming, and
- jogging.

2.4.2 Environmental Impacts

2.4.2.1 Significance Criteria

Impacts of the project on recreation would be considered significant if the proposed project would:

- affect an existing recreational facility such that substantial physical deterioration of the facility would occur or be accelerated; and/or

- result in the permanent loss of access to existing recreational facilities.

2.4.2.2 Impact Assessment

During the construction of the project, the public beach access at the top of the bluff at Beacon's Beach would be closed from September through May. The parking lot at the top of the bluff would also be closed for this period of time. Beach users would be directed south to Stone Steps Beach or north to Grandview Beach. Depending on the construction activities occurring, the beach could be closed to public access for safety purposes. This may occur during the delivery of equipment and materials required for construction of the shoreline protection structure and contouring the bluff face. Although the closing of the beach access would occur during the off-peak season, approximately 63,000 visitors would be affected by the closure (based on 170,000 visitors using the beach per year and 37 percent of annual usage occurring during the off-peak months). However, because this displaced usage level is not anticipated to be concentrated at one beach or park, and would temporarily be diffused during the nine-month off-peak season, there would not be substantial physical deterioration of existing recreational facilities.

Figure 2.4-1: Beaches and Parks in Encinitas

[INSERT COLOR FIGURE]

Project implementation would result in the reduction of existing public parking spaces at the site. There would be seven fewer public parking spaces (24 existing, 17 following construction) than what currently exists at the bluff-top parking area, or a 29 percent decrease.

Policy 5.5 of the Recreation Element of the Encinitas General Plan states that "…the City shall assure that existing public parking lots for public beach access points are maintained and that no reduction in the number of existing public parking spaces shall be permitted." The intent of this policy is to implement Goal 5 of the Recreation Element, which states that the City will continue to provide for coastal/shoreline recreation areas with effective access. Although the loss of parking spaces would reduce readily available access opportunities at the beach, the impact on recreation would not be significant because the objective of the project is to preserve and protect public access and improve public safety at Beacon's Beach. The project design and associated loss of parking spaces is required in order to meet these objectives and maintain consistency with Goal 5 in the Recreation Element. Without project implementation, the ongoing bluff erosion is expected to eliminate all public access and off-street parking at Beacon's Beach. This scenario would be inconsistent with General Plan policies contained the City's Recreation Element.

As discussed in Section 2.1.2.2, the project may result in the long-term loss of beach width (due to fixing the back of the beach), or passive erosion. Since the beach at the project site is a recreational resource, the geotechnical impact related to the loss of the beach width would also result in a potential significant impact upon recreation.

2.4.2.3 Summary of Significant Effects

Project implementation may result in significant impacts on recreation due to the potential long-term loss of beach width associated with passive erosion.

2.4.3 Mitigation, Monitoring, and Reporting Program

Implementation of mitigation measure Geo-2 (see Section 2.1.3.) would reduce the project's direct impact on recreation to below a level of significance. However, as discussed in Section 4.2, the project's cumulative impact on recreation would remain significant and unable to be mitigated.

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2.5 PUBLIC SAFETY

2.5.1 Environmental Setting

The following discussion of public safety focuses on two areas of concern: traffic safety during and following construction of the project, and general safety of residents and beach visitors during project construction.

Access to the Beacon's Beach overlook and parking area is via Leucadia Boulevard to Neptune Avenue. Neptune Avenue is a one-way street with travel flowing in a northerly direction parallel to the parking area of Beacon's Beach. Neptune Avenue primarily services local neighborhood traffic but also serves a significant amount of coastal-oriented traffic from users of Beacon's Beach and other up-coast and down-coast public access beaches. From the intersection of Neptune Avenue with Leucadia Boulevard, ingress to the parking area of Beacon's Beach follows Neptune Avenue in a northerly direction and at the northern extent of the parking area drivers make a left turn into the parking lot. Additionally, parking is provided adjacent to and parallel with the parking area on Neptune Avenue. Traffic exits the southerly end of the parking lot then proceeds easterly on Leucadia Boulevard, or via a left turn back onto Neptune Avenue in a northerly direction.

2.5.2 Environmental Impacts

2.5.2.1 Significance Criteria

Impacts of the project on recreation would be considered significant if the project would:

- cause an increase in traffic that 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);

- exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;

- 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;

- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

- result in inadequate emergency access;

- result in inadequate parking capacity;

- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks); and/or

- expose the public to safety risks above and beyond those typically encountered during construction of major public works projects and recreational facilities.

2.5.2.2 Impact Assessment

During project construction, access to the parking area and beach would be closed to the public from September through May. Neptune Avenue would remain open to normal traffic and access to the surrounding neighborhood would remain unimpeded by construction traffic. Deliveries of materials and equipment could provide brief periods of traffic congestion during the daylight hours. This could occur from trucks transporting construction-related materials and equipment along Leucadia Boulevard to Neptune Avenue and the project site. Standard traffic safety measures implemented during construction projects, such as caution signs, traffic cones, and flagmen, would ensure that construction impacts to traffic would not be significant.

Residents along Neptune Avenue in the vicinity of the project site would be impacted by the general construction activity during the various phases of construction (see Chapter 1—Project Description for a complete discussion of construction activities). This would include deliveries of materials and equipment to the project site, construction-worker traffic, and noise associated with demolition of the existing facilities and the construction of the new facilities. These impacts would not be significant because of their temporary nature.

During construction, the perimeter of the site would be surrounded with safety fencing and posted with signs indicating an active construction zone and that public access is prohibited. This would include a portion of the beach fronting the location of the bluff protection wall. A safety zone sufficient to preclude public access to this area would be cordoned off with safety fencing and construction personnel would instruct visitors that this area is off limits to the general public.

As stated in Section 1.4.1, heavy equipment would need to access the bluff via Moonlight Beach, a distance of approximately 1.25 miles. A Beach Encroachment Permit would be required for movement of construction vehicles and equipment along the beach. Standard conditions in the permit would include, but not be limited to, the following: advance notifications to the City Lifeguard; a beach barrier plan to protect the public from equipment movement, construction activity, and the construction site; a detailed construction traffic plan and haul route that is reviewed and approved by the City; flagmen within Moonlight Beach State Park when children are present, and other restrictions to ensure significant public safety impacts are avoided.

When construction activity is completed, traffic would resume to the pattern that existed prior to construction of the project. Traffic would continue to ensure safe travel between the work site and ingress to the beach at Moonlight Beach to access and exit the parking area in the same manner as before construction.

2.5.2.3 Summary of Significant Effects

No significant public safety impacts would occur during project construction with the implementation of standard construction safety precautions described in Section 2.5.2.2.

2.5.3 Mitigation, Monitoring, and Reporting Program

Because no significant public safety impacts would result from the project, no mitigation measures are necessary.

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2.6 PALEONTOLOGICAL RESOURCES

2.6.1 Environmental Setting

2.6.1.1 Physical Geological Setting

The project site lies within the western portion of the San Diego Coastal Plain, a geomorphic region lying west of the Peninsular Ranges that is characterized by elevated Quaternary marine and fluvial terraces that have been dissected by west-flowing streams and rivers. The coastal bluff portion of the project site provides excellent exposure of Eocene and Quaternary sedimentary deposits, including the Eocene-age Santiago Formation, the Pleistocene-age Bay Point Formation, and Recent colluvium and beach sands (see Figure 2.6-1). The contact between these two rock units occurs at an approximate elevation of 25 feet. Some areas of the bluff face are obscured by local accumulations of colluvium and artificial fill. Likewise, colluvial talus and modern beach sands locally obscure the bedrock units that occur at the toe of the bluff.

2.6.1.1.1 Bay Point Formation

The Bay Point Formation (Kennedy, 1975) represents a sequence of marine and/or non-marine sedimentary deposits of late Pleistocene age (approximately 0.1-0.3 million years old). Typical exposures of this formation consist of light brown to gray, fine- to coarse-grained, micaceous, friable sandstones and pebble conglomerates. The Bay Point Formation varies in thickness from less than 10 feet to over 100 feet and is thought to have been deposited under fluvial, aeolian, and shallow near-shore marine conditions (Kennedy, 1975). For the most part, these deposits accumulated on a flat, wave-cut platform (i.e., sea floor) during a period of dropping sea levels. Today, these deposits form the low mesa surfaces immediately adjacent to the coastline in the Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, Torrey Pines, La Jolla, and Pacific Beach areas of San Diego County. In the project area the Bay Point Formation consists of approximately 75 feet of friable to compact sandstone. This sandstone sequence can be subdivided into four informal units, including from bottom to top a basal marine unit, a lower B-lamination unit, a fossil sand dune unit, and an upper B-lamination unit. The lower marine unit is approximately 7 feet thick and consists of low-angle (2 to 4 degrees), cross-bedded friable sandstones and bioturbated sandstones. The lower B-lamination unit is approximately 8 feet thick and consists of light brown, massive, weakly cemented sandstones with distinct B-laminations. The fossil sand dune unit is approximately 15 feet thick and consists of gray, high-angle (24 to 33 degrees), east-dipping, cross-bedded, friable sandstones. The upper B-lamination unit is approximately 45 feet thick and consists of light brown, massive, weakly cemented sandstones with distinct B-laminations.

Fossils are common in the Bay Point Formation and have been recorded from Carlsbad to Pacific Beach. Fossils collected from these sites primarily consist of well-preserved remains of near-shore marine invertebrates, including shells of oysters, clams, scallops, snails, barnacles, crabs, and sand dollars (Valentine, 1961; Kern, 1977; Kern and Rockwell, 1992). Also recovered from these sites are sparse dental remains of sharks and rays, as well as rare remains of land mammals (Deméré and Walsh, 1993). During the field survey the only fossils observed on-site in the Bay Point Formation consisted of cylindrical burrows of *Ophiomorpha* sp. found in the lower marine sandstone unit. This type of trace fossil is generally thought to have been made by a burrowing annelid worm.

Figure 2.6-1: Generalized Stratigraphic Section at the Beacon’s Beach Access Project Site

[INSERT B&W FIGURE]

There are no records in the archives of the San Diego Natural History Museum of fossil localities occurring within the Bay Point Formation in this area of the City. The closest recorded localities occur in the coastal bluffs of Solana Beach and in inland Carlsbad. These localities have primarily produced well-preserved fossil remains of near-shore marine invertebrates. Based on results of the field survey and record search and on the generally patchy nature of fossils in the Bay Point Formation, it is suggested that there is a low potential for significant fossils to occur within the Bay Point Formation deposits exposed on the project site.

2.6.1.1.2 Santiago Formation

The Eocene bedrock unit exposed at the base of the coastal bluffs in this part of Leucadia has been called different names by various workers. Tan and Kennedy (1996) mapped these sedimentary rocks as the Santiago Formation, while Deméré and Boettcher (1985), Eisenberg (1985), and Irwin (1985) referred to the Eocene bluff deposits as the Ardath Shale. Based on a review of fossil evidence, it is probably most appropriate to refer to these deposits as the Santiago Formation, which is the designation used in this EIR.

The Santiago Formation was named by Woodring and Popenoe (1945) for a sequence of Eocene strata exposed in the Santa Ana Mountains of Orange County. The Eocene strata of northwestern San Diego County have generally been assigned to the Santiago Formation (Wilson, 1972), rather than to the La Jolla or Poway groups, because (with the exception of the Delmar Formation and Torrey Sandstone) the sequence of distinctive conglomerates that serves to divide and define formations of these latter groups does not occur in northwestern San Diego County. The nomenclatural boundary between the Santiago Formation and the La Jolla and Poway groups (excluding the Delmar and Torrey formations) is defined here as the point where the frequency and thickness of Poway-type conglomerates (Kies and Abbott, 1983; Abbott and Smith, 1989) becomes insignificant in observed stratigraphic sections. As so placed, this boundary occurs in the general area of Olivenhain and Cardiff-by-the-Sea (Eisenberg and Abbott, 1985). As recognized here, the Santiago Formation is broadly correlative with almost the entire middle Eocene stratigraphic sequence at San Diego (Pomerado Conglomerate to Ardath Shale), approximately 40 to 49 million years ago. Wilson (1972) subdivided the Santiago into three informal members, including, from oldest to youngest, Member A, Member B, and Member C. Generally speaking, Member A is non-marine in origin, Member B is primarily marine, and Member C is primarily non-marine. The Eocene-age deposits in the coastal bluffs at Beacon’s Beach are assigned to Member B. These deposits consist of an interbedded sequence of dark, olive-gray laminated mudstones, massive siltstones, and very fine-grained sandstones.

There are several fossil localities from Member B documented in the paleontological records of the San Diego Natural History Museum (SDNHM). Of these, two occur in the general area of the Beacon’s Beach project site. One site (SDNHM locality 2961) occurs immediately south of the project site and has produced well-preserved remains of sublittoral marine mollusks, as well as sparse remains of marine vertebrates (Deméré and Boetcher, 1985). Another site (SDNHM locality 3266) occurs just to the north of the project site and has produced well-preserved remains of sharks and rays (Irwin, 1985). Fossils from both localities suggest a geologic age of approximately 42 million years for the Santiago Formation deposits at Beacon’s Beach.

During the field survey, well-preserved remains of near-shore marine mollusks were observed in olive-gray sandstones of the Santiago Formation exposed in the toe of a landslide just south of the project area.

The documented occurrence of significant paleontological resources from localities in the Santiago Formation immediately north and south of Beacon's Beach indicates that there is a high potential for significant fossils to occur within the Santiago Formation deposits exposed on the project site.

2.6.2 Environmental Impacts

2.6.2.1 Significance Criteria

The project may have a significant effect on paleontological resources if it would impact a geologic formation having a high resource potential.

2.6.2.2 Methodology

A review was conducted of relevant published and unpublished geologic reports (Eisenberg, 1985; Irwin, 1985; Tan and Kennedy, 1996; URS, 2003), published and unpublished paleontological reports (Deméré and Boettcher, 1985; Deméré and Walsh, 1993), and museum paleontological site records. This approach was followed in recognition of the direct relationship between paleontological resources and the geologic formations within which they are entombed. Knowing the geology of a particular area and the fossil productivity of particular formations that occur in that area, it is possible to predict where fossils would, or would not, be encountered. A field survey of the project site and closely adjacent parcels was conducted to search for and document exposed paleontological resources and to determine the potential for and significance of construction-related impacts on these resources.

2.6.2.3 Impact Assessment

As defined here, paleontological resources (i.e., fossils) are the remains and/or traces of prehistoric plant and animal life exclusive of humans. Fossil remains, such as bones, teeth, shells, leaves, and wood, are found in the geologic deposits (rock formations) within which they were originally buried. For the purposes of this report, paleontological resources can be thought of as including not only the actual fossil remains but also the collecting localities and the geologic formations containing those localities.

Direct impacts to paleontological resources occur when earthwork activities, such as mass grading operations or pipeline trenching activities, cut into the geological deposits within which fossils are buried. These direct impacts are in the form of physical destruction of fossil remains. Since fossils are the remains of prehistoric (i.e., extinct) animal and plant life, they are considered to be nonrenewable. Such impacts can be significant and, under CEQA guidelines, require mitigation. Impacts to paleontological resources are rated in this report from high to zero depending upon the resource sensitivity of impacted geologic deposits.

For the Beacon's Beach Access Project, the Santiago Formation is assigned a high paleontological resource sensitivity, while the Bay Point Formation is assigned a low paleontological resource sensitivity. In turn, excavation-related impacts to paleontological resources are rated as highly significant (Santiago Formation) or moderately significant (Bay Point Formation). To evaluate the location of potential impacts within the project, the contact between the Bay Point Formation and the Santiago Formation, which occurs at approximately elevation 25 feet, can be used as a reference point. Project impacts located below this level would be significant (Santiago Formation), while those located above this level would not be significant.

The project involves construction of a concrete bluff protection wall, a shower station, a new lifeguard tower, trail improvements, parking lot improvements, and attendant bluff landscape remediation. It is likely that construction of the bluff protection wall, and possibly the shower station and lifeguard tower, would result in excavations into the Santiago Formation. All of the other bluff improvements would likely result in excavations into the Bay Point Formation.

2.6.2.4 Summary of Significant Effects

Excavation of footings for the seawall—It is assumed that excavation of footings would be confined to bedrock deposits of the Eocene-age Santiago Formation. These excavations may result in direct impacts (i.e., destruction) of fossil remains preserved within the sandstone and siltstone strata of the Santiago Formation.

Excavation for shower station—If foundation excavations for the shower station extend below elevation 25 feet, it is likely that they would encounter bedrock deposits of the Eocene-age Santiago Formation. If this occurs, the excavations may result in significant impacts (i.e., destruction) of fossil remains preserved within the sandstone and siltstone strata of the Santiago Formation.

Excavation for lifeguard tower—If foundation excavations (including large diameter borings) for the lifeguard tower extend below elevation 25 feet, it is likely that they would encounter bedrock deposits of the Eocene-age Santiago Formation. If this occurs, the excavations may result in significant impacts (i.e., destruction) of fossil remains preserved within the sandstone and siltstone strata of the Santiago Formation.

2.6.3 Mitigation, Monitoring, and Reporting Program

Mitigation of the impacts discussed above can be reduced by implementing the following measures:

PALEO-1: A paleontological monitoring program shall be provided during all soil excavation at or below the elevation of 30 feet above mean sea level (AMSL) per the following requirements:

(a) Prior to issuance of a grading permit, a letter of verification shall be provided to the Planning and Building Department stating that a qualified paleontologist and/or paleontological monitor have been retained to implement the monitoring program. The requirement for paleontological monitoring shall be noted on the grading plan. All persons involved in the paleontological monitoring of the project shall be approved by the Planning and Building Department prior to the start of monitoring. The Planning and Building Department shall be notified of the start and end of construction.

(b) The paleontologist or paleontological monitor shall be on-site full-time during the initial cutting of previously undisturbed areas at or below the elevation of feet 30 AMSL. Monitoring may be increased or decreased at the discretion of the qualified paleontologist, in consultation with the Planning and Building Department, and will depend on the rate of excavation, the materials excavated, and the abundance of fossils.

(c) When requested by the paleontologist, the city engineer shall divert, direct, or temporarily halt construction activities in the area of discovery to allow recovery of fossil remains. The paleontologist shall immediately notify the Planning and Building Department of such finding at the time of discovery. The Planning and Building Department shall approve salvaging procedures to be performed before construction activities are allowed to resume.

(d) The paleontologist shall be responsible for preparation of fossils to a point of curation and submittal of a letter of acceptance from a local qualified curation facility. Any discovered fossil sites shall be recorded by the paleontologist at the San Diego Natural History Museum.

(e) Prior to the release of the grading bond, a monitoring results report, with appropriate graphics (i.e., location map and stratigraphic column with plotted fossil occurrences), summarizing the results, analysis and conclusions of the paleontological monitoring program shall be submitted to and approved by the Planning and Building Department.