

3.15 PUBLIC HEALTH AND SAFETY

This section addresses public health and safety impacts associated with implementation of the Enhancement Project, focusing on topics such as hazardous materials, wildland fires, vectors, and recreational safety. Flooding and flood hazards are discussed in Section 3.2 Hydrology. Sediment and chemical composition of dredged material are further detailed in Section 3.4 Water and Aquatic Sediment Quality; however, this section discusses these issues in terms of the potential exposure of contaminants to people and the environment.

The baseline conditions described in this section are based largely on information from the following technical studies: *Buena Vista Lagoon Restoration Program Sediment Characterization Data Report* (SAIC 2008a) and the *Buena Vista Lagoon Restoration Feasibility Study Sediment Characterization*, Final Report (Everest and Battelle 2003). Due to the static nature of underlying sediment, the sediment conditions described in these reports accurately reflect conditions at the time of NOP publication. Information from the 2014 San Elijo Lagoon Restoration Project Draft EIR/EIS (SELC 2014), and the 2012 RBSP EA/Final EIR (SANDAG 2011) are also referenced, as appropriate. Baseline vector information is generally provided by County of San Diego Vector Control 2014 publications as referenced throughout this section.

3.15.1 EXISTING CONDITIONS

Regulatory Setting

A full description of the regulatory setting for this document can be found in Appendix B. The following laws, regulations, policies, and plans are applicable to this resource area:

- Executive Order 12088
- California Code of Regulations; Title 14 Division 1.5
- San Diego County Vector Control Program

Buena Vista Lagoon Study Area

The Enhancement Project activities would take place within the lagoon and inlet areas. Water craft and ocean vessels are not allowed in the lagoon; thus, vessel safety is not a topic analyzed for the lagoon study area. Discussion of vessel safety can be found within the materials placement/reuse section.

Hazardous Materials and Public Safety

The Buena Vista Lagoon study area is not listed as a hazardous materials site on State of California Hazardous Waste and Substances lists compiled pursuant to Government Code Section 65962.5, and no known sites are located in the immediate vicinity of the project area (DTSC 2014a; 2014b). As detailed in Section 3.4 Water and Aquatic Sediment Quality, chemical analysis of sediments in Buena Vista Lagoon was conducted following protocols in the *Buena Vista Lagoon Restoration Program Sediment Characterization Sampling and Analysis Plan/Quality Assurance Plan* (SAIC 2008b). A total of 19 samples were collected in the four basins. Borings were collected from upper and lower layers of sediments extending to a depth of 20 feet bgs.

To characterize chemical suitability of the project sediments, NOAA numerical SQGs for aquatic sediment were used as an informal, interpretive tool, which include two SQG concentrations thresholds: “Effects Range-Low” (ERLs), where adverse effects were not likely with concentrations below this level; and “Effects Range-Median” (ERMs), concentrations above which adverse effects were more likely (NOAA 1999).

The chemical analysis found minimal evidence of contamination of elemental or organic compounds. As previously shown in Table 3.4-1, the chemical analysis showed that most of the tested analytes fell below their respective ERLs and no analytes were detected above their ERMs. Those chemicals with concentrations above their respective ERLs included DDE, arsenic, chromium, copper, lead, mercury, and zinc (SAIC 2008a). These findings are consistent with previous lagoon sediment sampling completed in 2003 that also found concentrations of elements and organic compounds to be well below levels that cause environmental concern (Everest and Battelle 2003).

Wildland Fire Hazards

The project site is not located within a Fire Hazard Severity Zone within areas of state responsibility as identified by the California Department of Forestry and Fire Protection (CAL FIRE 2007). However, a small area of open space adjacent to both the west and east sides of I-5 within the Oceanside Local Responsibility Area (LRA) is designated as a Very High Fire Hazard Severity Zone (CAL FIRE 2009a). Additionally, on the south side of the lagoon within the Carlsbad LRA, locations adjacent to the lagoon along the 1-5 corridor and to the east within the open space and residential areas along Jefferson Road and adjacent to the lagoon are also identified as Very High Fire Hazard Severity Zones (CAL FIRE 2009b). The vegetation in this area of the lagoon begins to transition out of marsh habitats and into areas of scrub habitat with

some locations of fairly dense shrub and vegetation. Wildland fire safety concerns in these areas exist due to the presence of native and exotic vegetation in proximity to residences.

Vectors

The term “vector” is used to denote a carrier of disease organisms. The vector may be purely mechanical (houseflies spreading enteric organisms), or biological, wherein the disease organism multiplies or undergoes change within the vector (the development of encephalitic viruses in mosquitoes). Buena Vista Lagoon has long been a mosquito breeding site. With no tidal circulation, the lagoon habitat has become dominated by freshwater cattails resulting in breeding habitat for mosquitoes.

A number of receptors are sensitive to vector-borne diseases in the vicinity of the lagoon, such as people at adjacent and nearby residences; people at beach facilities; people recreating at the lagoon; and people at public parks near the lagoon. The Nature Center on the north shore of the lagoon hosts many outdoor programs for school-aged students (3,000 students annually), public field trips, and monthly bird counts, along with a variety of other group tours and class outings (Buena Vista Audubon Society 2014). Without comprehensive steps to limit their exposure to vector-borne disease, the beneficiaries of these important recreational and education programs, including many residing outside San Diego County, are at risk.

The conditions that tend to favor mosquitoes are stagnant, fresh or brackish water with minimal circulation; narrow channels or a limited circulation system; and dense vegetation. Key management strategies to control vector populations in water bodies focus on breaking the larval life cycle before they mature and become adult mosquitoes. Strategies focus on increasing water circulation and wave action, varying water levels, decreasing vegetation such as cattails, decreasing nutrients and reducing water temperatures, and providing improved access for natural predators of larval and adult mosquitoes (aquatic and airborne) to potential breeding areas. Aerial larvicide treatments can also become more effective if channels are extended through dense vegetation that may otherwise prevent the larvicide from reaching the water surface. Common natural predators of aquatic mosquito larvae include *Gambusia* (“mosquito fish”), native killifish and stickleback, other small native and nonnative fish species, and the aquatic nymph stages of dragonflies and damselflies (*Odonata*). Predators of adult mosquitoes include frogs, bats, swallows, purple martins, and many other insectivorous bird species.

Mosquito infestation associated with Buena Vista Lagoon has been on the rise with the shallowing, relatively stagnant water at the lagoon and is a valid concern for local residents and visitors. Mosquito capture count data were provided by the County of San Diego Vector Control for three county lagoons: Buena Vista Lagoon, San Elijo Lagoon, and Los Peñasquitos Lagoon.

The mosquito data, from 2009–2013 show that, of the three lagoons, Buena Vista Lagoon has the highest counts of mosquitos throughout the 5-year collection dates with cyclical increase of mosquitos in summer (County of San Diego 2014b). Trapping is completed every 2 weeks throughout the year for monitoring purposes and also includes a flock of sentinel chickens for detection of west Nile virus (County of San Diego 2014c). Additional information provided by County of San Diego Vector Control states that Buena Vista Lagoon is a consistent high breeder of mosquitoes with excessive amounts of impenetrable vegetation creating very limited access. The County Vector Control Program receives frequent complaints of mosquito infestations from area residents. The Vector Control Program applies an aerial treatment of bacterial granular larvicide (VectoMax) to approximately 120 acres of the lagoon every 3 to 4 weeks during mosquito breeding season (generally April to October), targeting the vegetation areas and algae mats (County of San Diego 2014a). The granular larvicide used by the Vector Control Program acts specifically on mosquito larvae and will not harm people, pets, plants, or wildlife. The larvicide consists of granules containing *Bacillus thuringiensis israelensis* and/or *Bacillus sphaericus*. These naturally occurring bacteria target mosquito larvae and prevent them from developing into biting adults (County of San Diego 2014c).

Recreational Safety

As discussed in Section 3.1 Land Use and Recreation, various recreational opportunities exist within and immediately surrounding the lagoon and beach inlet area. Some of these recreational facilities and opportunities include the Nature Center in Oceanside, fishing around the lagoon perimeter, nature observation, and city parks within the City of Carlsbad, including Maxton Brown Park and Hosp Grove Park. Swimming, wading, diving, or other water contact recreation is not allowed within the lagoon (BVLf 2014). The beach area surrounding the proposed inlet location is mostly used for typical beach-related recreation activities, such as sunbathing, swimming, wading, picnicking, and other similar activities.

Materials Disposal/Reuse Study Area

The materials disposal/reuse project component would place suitable dredged materials from the lagoon within the coastal environment offshore, nearshore, or onshore. These areas, by nature, are not susceptible to hazards related to vectors or wildland fires and those topics are not further analyzed in association with proposed materials disposal/reuse.

Recreational Safety

Potential materials disposal and reuse sites include beach areas in Oceanside and North Carlsbad and a nearshore location in Oceanside. These beach materials placement sites host a variety of

recreation activities, including walking/jogging, swimming, surfing, stand-up paddle boarding, windsurfing, sunbathing, beach combing, fishing, SCUBA and skin diving, picnicking, boating, sailing, and bicycling. The nearshore site is surrounded by open water but is an active surfing location.

Vessel Safety

During materials placement or disposal, vessel safety is a concern as operations may include a variety of ocean-based barges, monobuoys, and discharge pipelines traversing waters used by ocean-based vessels. Commercial boats, fishing boats, and recreational vessels currently traverse the overall project area along the San Diego coast. Most vessels in the immediate area operate out of Oceanside Harbor, as well as other regional locations, including Mission Bay and San Diego Bay.

3.15.2 SIGNIFICANCE CRITERIA

Per Appendix G of the CEQA Guidelines, Aa significant impact to public health and safety would occur if the Enhancement Project would result in any of the following:

- A. Creation of a significant hazard to the public or the environment through the transport, use, or disposal of hazardous materials;
- B. Location on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, creates a significant hazard to the public or environment;
- C. Exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires, including locations where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands (lagoon enhancement only);
- D. Substantial increase in human exposure to vectors, such as mosquitoes, that are capable of transmitting significant public health diseases or creating nuisances (lagoon enhancement only);
- E. Substantial increase in hazards for people surfing, swimming, walking, or otherwise recreating in and around a lagoon inlet; or
- F. Substantial public health hazard from management or disposal of dredged/excavated material.

3.15.3 IMPACT ANALYSIS

Lagoon Enhancement

Freshwater Alternative

Hazardous Materials and Public Safety

Enhancement activities would include dredging of materials within the lagoon. Sediment quality investigations have been conducted on materials present within the lagoon basins. As described in Section 3.15.1 above, chemical analysis found that most of the tested analytes fell below their respective ERL thresholds, where adverse effects were not likely with concentrations below this level. Testing also showed that all four basins within the lagoon have some material with pesticide and metal levels that exceed their respective ERL thresholds (summarized in Table 3.4-1); however, no levels exceeded ERM thresholds (SAIC 2008a). While pesticide and metal levels were detectable in lagoon material, the ERM threshold defines concentrations above which adverse effects are more likely. Thus, because concentration levels were all below the defined ERM thresholds and there are very limited exposure pathways for humans, it can be assumed that these contaminants levels would not pose an adverse effect on human health during dredging operations (Everest 2014i, j). Thus, **potential risk associated with contaminants in dredged material would be less than significant (Criteria A and F).**

Construction equipment would require a number of petroleum products such as fuel, hydraulic fluids, and lubricants for effective operation. Fuel replenishment would be required daily for most of the heavy equipment. Consistent with standard construction practices (Table 2-9), fueling and/or maintenance activities would occur at the staging areas away from publicly accessible areas to ensure the public is not exposed to, or has access to, the hazardous materials associated with the construction activities. The contractor would be required to prepare an SPCC plan for hazardous spill containment. The SPCC plan would ensure that spills would be cleaned up in accordance with permit conditions and that all employees would understand the proper procedures associated with a cleanup so that it would be carried out correctly. As required by law (Health and Safety Code, Division 20, Chapter 6.95, Article 2, Section 25500-25520), storage, handling, transport, emission, and disposal of hazardous materials associated with construction activities would be in full compliance with local, state, and federal regulations, which provide requirements to ensure proper and appropriate actions specific to minimizing hazardous materials risk. **Potential risk associated with the transport, use, or disposal of hazardous materials or location near a hazardous material site would be minimized, and impacts would be less than significant (Criteria A and B).**

During construction of the Freshwater Alternative, heavy equipment and vehicles would be present in the project site for lagoon enhancement activities, including dredging within the lagoon and vegetation removal. Consistent with standard construction practices (Table 2-9), during non-work hours, heavy equipment and vehicles in areas that could be accessed by the public would be secured in a general contractor's staging area and would not pose a safety hazard as secure staging areas would minimize the potential for the public to access the equipment. Construction areas would be staked and no construction zones defined to minimize public trespass or accidental entry into those potentially unsafe areas. Additionally, a public information program would be implemented to assist nearby residents in understanding pertinent project information and minimize the desire to enter unsafe construction zones to see what was occurring. Additionally, the contractor would coordinate as appropriate with applicable agencies regarding construction and maintenance schedules including, but not limited to, Oceanside Fire Department, Oceanside Police Department, Carlsbad Fire Department, and Carlsbad Police Department to ensure that public safety concerns or issues were addressed prior to initiation of construction activities and allow for necessary advanced planning on part of those applicable agencies. Ongoing maintenance activities would be subject to these same safety precautions in an effort to minimize public safety hazards associated with heavy equipment operating in and around the lagoon. **Implementation of the Freshwater Alternative would not cause a substantial increase in public safety hazards, and impacts would be less than significant (Criterion E).**

Wildland Fire Hazards

Portions of the project site, most specifically along the south side of the lagoon east of I-5 along Jefferson Street, are located within and adjacent to lands that have the potential to support wildland fires and are in proximity to residential areas. The Freshwater Alternative would result in dredging operations and vegetation clearing and grubbing activities within the lagoon boundaries, a portion of which is within and adjacent to areas identified as a Very High Fire Hazard Severity Zone. Additionally, haul routes and site access points (Figure 2-16) would be located within wildland interface areas identified along Jefferson Street and through parts of the lagoon. Staging and access along Lagoon View Drive would also be in proximity to identified fire hazard zones to the south through the lagoon and near Marron Road.

Fire hazards from construction equipment or activities are not anticipated with implementation of the Enhancement Project as staging and access areas would be located in previously disturbed areas with minimal vegetation to minimize the risk of accidental ignition of surrounding vegetation and work within the wet marshy areas of the lagoon would not be high risk areas. This, as well as other standard construction practices identified in Table 2-9, would be implemented to maintain fire safety. Construction equipment used in enhancement and

maintenance activities would have fire suppression equipment on board or at the worksite so that accidental fires could be quickly extinguished, heavy equipment operators would be trained in appropriate responses to accidental fires so that an accidental fire would be dealt with expediently before spreading, and emergency communication equipment would also be available to site personnel to quickly call for help if an accidental fire were to occur and require additional assistance to be extinguished.

Enhancement activities would not introduce new or permanent structures within the lagoon area that would create or be subject to new or increased fire hazards. The Boardwalk would be a new structure resulting from the Enhancement Project, but would not be considered a substantial source of fire hazard or be located in an area highly susceptible to fire risk.

Potential risk associated with wildland fires would be minimized, and impacts would be less than significant (Criterion C).

Vectors

Vector issues are an existing concern at the lagoon and are addressed routinely by San Diego County Vector Control, primarily via aerial application of granular larvicide. The potential for project impacts must be evaluated during the construction period and post-construction given modified habitats, channels, and water areas.

During construction, heavy equipment, construction vehicles, and other tools/storage facilities would be present along the edges of the lagoon. There is some potential for rainwater or other water sources to become impounded in small containers or wheel ruts. Given the rapid mosquito life cycle, an impoundment of 7 to 10 days can allow for successful breeding. As described in standard construction practices (Table 2-9), a construction monitor would be on-site during construction. That person would perform a variety of tasks to ensure construction remains within the right-of-way and complies with design features, standard regulations, permit conditions, construction specifications, and mitigation measures. One responsibility will be confirmation that the contractor is satisfying construction specifications dictating no ponded water, which would ensure that no new breeding conditions would be created during construction. The monitor would also be empowered to release small containers of water to eliminate breeding conditions.

Post-construction habitats resulting from the Freshwater Alternative would remain similar to those supported under existing conditions; however, enhancement activities would focus on removal of vegetation encroaching into open water areas and decreasing vegetation density. Approximately 129,000 cy of vegetation (e.g., cattails) would be removed. Dredging would be used to minimize the potential for vegetation to expand back into open water areas and to remove

nutrient-rich sediments from the lagoon. This alternative would result in an increase in open water areas (134.4 acres proposed) and deep open water (4.5 acres proposed) within the lagoon compared to existing conditions (106.8 and 0 acres, respectively). This would increase unfavorable habitats for mosquitoes (open water) as it would increase the ability of waves and ripples to be created on the water surface and interrupt the mosquito reproduction process, leading to increased mortality of eggs, larvae, and pupae.

In addition to the lagoon enhancement activities that would occur under this alternative, the adaptive management plan, detailed in Section 2.9, provides for specific measures aimed at monitoring and further reducing vector populations. Key strategies would focus on increasing water circulation and wave action, decreasing vegetation such as cattails, and providing improved access for natural predators of larval and adult mosquitoes (aquatic and airborne) to potential breeding areas. To accomplish this, specified areas of cattail management (generally large expanses of cattail habitat) would have channels mowed through them at regular intervals to allow for swaths of open water throughout the densely vegetated areas. Interspersed channels throughout the marsh vegetation would reduce the production of adult mosquitos by allowing for increased predation of mosquito larvae by natural predators; increasing the effectiveness of aerial treatments by allowing the larvicide to reach the water surface where it is most effective, rather than being caught in the vegetation canopy and on debris; increasing water circulation and wind wave action, which creates poor vector breeding conditions; and improving water exchange and turnover to reduce the formation of persistent algal mats on which adult mosquitos lay eggs.

As described above, implementation of the Freshwater Alternative would result in a less-conducive vector breeding condition and reduce the public health and safety risk associated with mosquito-borne diseases. Substantial increases in human exposure to vectors are not anticipated during construction or after implementation of this alternative. **Implementation of the Freshwater Alternative would not substantially increase human exposure to vectors, such as mosquitoes, that are capable of transmitting significant public health diseases or creating nuisances, and less than significant impacts would occur (Criterion D).**

Recreational Safety

As described in Section 3.1 Land Use and Recreation, no existing formal trails traverse through the lagoon, but many informal paths lead from surrounding areas to the lagoon edge and are often used for fishing access and nature observation and enjoyment. As shown in Figure 2-16, the staging areas and access roads are dispersed in various locations around the lagoon as needed and would be sited at some of the existing access points. As a standard construction practice (Table 2-9), active construction areas are restricted to maintain public safety. Therefore, access to portions of the lagoon would be temporarily restricted. Construction areas would be staked and

no construction zones defined to minimize public trespass or accidental entry into those potentially unsafe areas. Ongoing maintenance activities would be subject to these same safety precautions in an effort to minimize public safety hazards associated with heavy equipment operations to people recreating in and around the lagoon. Additionally, a public information program would be implemented to disseminate pertinent project information and minimize the desire to enter unsafe construction zones to see what was occurring. **Standard construction practices would protect recreationalists who access the lagoon area and ensure public safety is maintained, and impacts would be less than significant (Criterion E).**

Long-term Benefits

The Freshwater Alternative would provide vector control by turning vegetated into open water areas, thus decreasing favorable vector habitat. The adaptive management plan also specifies actions that would provide ongoing reduction of breeding and lifecycle opportunities for vectors, resulting in a perpetual public health and safety benefit. Because this alternative would remove the least amount of vector habitat, it would provide the smallest health and safety benefit of the three alternatives.

Saltwater Alternative

Hazardous Materials and Public Safety

The sediment quality and contaminants analysis provided under the Freshwater Alternative is applicable to the Saltwater Alternative as enhancement activities would include dredging of materials within the lagoon. While pesticide and metal levels were detectable in lagoon material, concentration levels were all below the defined ERM thresholds. Thus, because the contaminants were below threshold levels and there are very limited exposure pathways for humans, it can be assumed that these contaminants levels would not pose an adverse effect on human health during dredging operations (Everest 2014i, j). Therefore, **potential risk associated with contaminants in dredged material would be less than significant (Criteria A and F).**

Construction equipment would require a number of petroleum products such as fuel, hydraulic fluids, and lubricants for effective operation, and measures as described for the Freshwater Alternative would also be implemented for the Saltwater Alternative. As required by law, storage, handling, transport, emission, and disposal of hazardous materials associated with construction activities would be in full compliance with local, state, and federal regulations, which provide requirements to ensure proper and appropriate actions specific to minimizing hazardous materials risk. **Potential risk associated with the transport, use, or disposal of**

hazardous materials or location near a hazardous material site would be minimized, and impacts would be less than significant (Criteria A and B).

Standard construction measures identified in Table 2-9 related to heavy equipment and construction area safety would be implemented for the Saltwater Alternative and would protect publicly accessible areas within and surrounding the lagoon to ensure public safety is maintained. Ongoing maintenance activities would be subject to these same safety precautions and minimize public safety hazards associated with heavy equipment operating in and around the lagoon. **Implementation of the Saltwater Alternative would not cause a substantial increase in public safety hazards, and impacts would be less than significant (Criterion E).**

Wildland Fire Hazards

As described for the Freshwater Alternative, portions of the project site are within and adjacent to identified fire hazard areas, most specifically along the south side of the lagoon east of I-5 along Jefferson Street. The Saltwater Alternative would result in dredging operations and vegetation clearing and grubbing activities within the lagoon boundaries, within and adjacent to areas identified as a Very High Fire Hazard Severity Zone. Similar to the Freshwater Alternative, haul routes, staging, and site access points (Figure 2-16) would be located within wildland interface areas identified along Jefferson Street, near Lagoon View Drive, and through parts of the lagoon.

Fire hazards from construction equipment or activities are not anticipated with implementation of the Enhancement Project as standard construction practices identified in Table 2-9, such as locating staging and access areas in previously disturbed areas, would minimize the risk of accidental ignition of surrounding vegetation. Work within the wet marshy areas of the lagoon would not be in high risk areas.

Enhancement activities would not introduce new or permanent structures within the lagoon area that would create or be subject to new or increased fire hazards. The Boardwalk would be a new structure resulting from the Enhancement Project, but it would not be considered a substantial source of fire hazard or be located in an area highly susceptible to fire risk. **Potential risk associated with wildland fires under the Saltwater Alternative would be minimized, and impacts would be less than significant (Criterion C).**

Vectors

As described in standard construction practices (Table 2-9), a construction monitor would be on-site during construction. One responsibility will be confirmation that the contractor is satisfying

construction specifications dictating no ponded water, which would ensure that no new breeding conditions would be created during construction. The monitor would also be empowered to release small containers of water to eliminate breeding conditions as described for the Freshwater Alternative.

Under the Saltwater Alternative, the hydrologic regime of the lagoon would be changed from the existing freshwater system to a saltwater system. The new tidal action that would result with implementation of the Saltwater Alternative would lead to a much larger area inundated at high tide, and a smaller area inundated at low tide. More open water and the dynamic hydrologic cycle of tides would interrupt the mosquito reproduction process, and would lead to substantially increased mortality of eggs, larvae, and pupae. Eggs laid on water during one point of the tide may be left totally high and dry during the subsequent low tide, or delivered directly to the ocean by tidal currents.

Tidal action under the Saltwater Alternative would also result in other benefits for mosquito abatement, including increased salinity, which reduces the ability of these vectors to reproduce; quick draw-down, which prevents establishment of stagnant ponds on the lagoon edges; and habitat transition resulting in less dense stands of cattails that cannot survive the saline waters creating better circulation of water and improved effectiveness of vector control measures.

Additionally, the new and cooler ocean water entering the lagoon would create a poor temperature-based environment for larvae survival. Existing nutrient-rich soils currently cause the lagoon system to become eutrophic and create good breeding habitat/food for larvae. Large volumes of this soil (781,000 cy of sediment) would be removed as part of the Saltwater Alternative through shallow grading/dredging.

Post-construction habitats within the lagoon would be substantially modified under the Saltwater Alternative. Existing freshwater marsh and open water areas would be replaced with coastal salt marsh and open marine water areas. The alternative would include a subtidal, open water channel running from the ocean to approximately halfway through the I-5 Basin. This alternative would decrease habitats good for mosquito propagation and harborage (dense expanses of freshwater marsh) and increase unfavorable habitats for mosquitoes (open water, channels within marsh areas, tidal mudflats, regularly inundated/tidally drained areas).

Enhancement activities would also focus on removal of vegetation encroaching into open water areas and decreasing vegetation density. Approximately 211,000 cy of vegetation (e.g., cattails) would be removed and would reduce the amount of aquatic vegetation available for larvae protection and would allow predators, such as aquatic invertebrates, fish, birds, and dragon flies, to access and feed on the larvae more efficiently.

In addition to the lagoon enhancement activities that would occur under this alternative, the adaptive management plan, detailed in Section 2.9 and described under the Freshwater Alternative, would also be implemented as part of the Saltwater Alternative and provide additional vector control measures post-construction.

As described above, implementation of the Saltwater Alternative would result in a less-conducive vector breeding condition and reduce the public health and safety risk associated with mosquito-borne diseases. Substantial increases in human exposure to vectors are not anticipated during construction or after implementation of this alternative. **Implementation of the Saltwater Alternative would not substantially increase human exposure to vectors, such as mosquitoes, that are capable of transmitting public health diseases or creating nuisances, and less than significant impacts would occur (Criterion D).**

Recreational Safety

As detailed in Section 3.1 Land Use and Recreation, the Saltwater Alternative would create a new inlet that would modify the existing beach through permanent conversion of an approximately 100-foot-wide sandy beach area to a new lagoon inlet open to tidal action. The opening of the tidal inlet channel across the beach would at times interrupt access along the beach due to water depth and velocity and intermittently render the inlet unsafe for some recreationalists, both on a seasonal and daily basis (Everest 2014c, d). Relative to the existing sandy beach that currently exists, the open inlet across the beach could result in a new safety threat to recreational users in the inlet areas when unsafe conditions exist due to high water volumes or velocities within the inlet channel. Recreationalists could be tempted to cross the inlet in unsafe conditions as no other easily accessible north/south route is available along the beach. **Thus, operation of the Saltwater Alternative with the new inlet could result in a substantial permanent increase in hazards for people swimming, walking, or otherwise recreating in the proposed lagoon inlet, and impacts would be significant (Criterion E).**

As previously described, many informal paths lead from surrounding areas to the lagoon edge and nearby beach areas and are often used for recreation access. Staging areas and access roads would be dispersed in various locations around the lagoon as needed and would be sited at existing access points and previously disturbed areas consistent with standard construction practice and as described for the Freshwater Alternative. **As a result, public safety would be maintained during construction, and impacts would be less than significant (Criterion E).**

Long-term Benefits

The Saltwater Alternative would provide public health and safety benefits through increased vector control from the conversion of the hydraulic regime to saltwater and tidal influence. The

post-project conditions would not be conducive to vector breeding and lifecycle. Vegetation removal and elimination of freshwater marsh would be highly beneficial, as the existing vector control methods currently used on the lagoon are rendered less effective by the large expanses of dense cattail vegetation. The adaptive management plan also specifies actions that would provide ongoing reduction of breeding and lifecycle opportunities for vectors, resulting in a perpetual public health and safety benefit. Although the Hybrid Alternative would include similar actions, the Saltwater Alternative would implement such actions over a greater portion of the lagoon. For these reasons, the Saltwater Alternative would result in the highest level of public health and safety benefit of the three alternatives.

Hybrid Alternative

Hazardous Materials and Public Safety

The sediment quality and contaminants analysis provided under the Freshwater Alternative is applicable to the Hybrid Alternative as enhancement activities would include dredging of materials within the lagoon. While pesticide and metal levels were detectable in lagoon material, concentration levels were all below the defined ERM thresholds and there are very limited exposure pathways for humans. Therefore, contaminants levels would not pose an adverse effect on human health during dredging operations (Everest 2014i, j). **Potential risk associated with contaminants in dredged material would be less than significant (Criteria A and F).**

Construction equipment would require a number of petroleum products such as fuel, hydraulic fluids, and lubricants for effective operation, and standard construction measures described for the Freshwater Alternative would also be implemented for the Hybrid Alternative. As required by law, storage, handling, transport, emission, and disposal of hazardous materials associated with construction activities would be in full compliance with local, state, and federal regulations, which provide requirements to ensure proper and appropriate actions specific to minimizing hazardous materials risk. **Potential risk associated with the transport, use, or disposal of hazardous materials or location near a hazardous material site would be minimized, and impacts would be less than significant (Criteria A and B).**

Additionally, standard construction measures related to heavy equipment and construction area safety would be implemented for the Hybrid Alternative and would ensure public safety is maintained. Ongoing maintenance activities would be subject to these same safety precautions in an effort to minimize public safety hazards associated with heavy equipment operating in and around the lagoon. **Thus, implementation of the Hybrid Alternative would not cause a substantial increase in public safety hazards, and impacts would be less than significant (Criterion E).**

Wildland Fire Hazards

As described for the Freshwater Alternative, portions of the project site are within and adjacent to identified fire hazard areas, most specifically along the south side of the lagoon east of I-5 along Jefferson Street. To the greatest extent of all three build alternatives, the Hybrid Alternative would result in dredging operations and vegetation clearing and grubbing activities within the lagoon boundaries, within and adjacent to areas identified as a Very High Fire Hazard Severity Zone. Similar to the Freshwater Alternative, haul routes, staging, and site access points (Figure 2-16) would be located within wildland interface areas identified along Jefferson Street, near Lagoon View Drive, and through parts of the lagoon.

Fire hazards from construction equipment or activities are not anticipated with implementation of the Enhancement Project as staging and access areas would be located in previously disturbed areas with minimal vegetation to minimize the risk of accidental ignition of surrounding vegetation and work within the wet marshy areas of the lagoon would not be high risk areas.

Enhancement activities would not introduce new or permanent structures within the lagoon area that would create or be subject to new or increased fire hazards. The Boardwalk would be a new structure resulting from the Enhancement Project, but it would not be considered a substantial source of fire hazard or be located in an area highly susceptible to fire risk. **Potential risk associated with wildland fires under the Hybrid Alternative would be minimized, and impacts would be less than significant (Criterion C).**

Vectors

As described in standard construction practices (Table 2-9), a construction monitor would be on-site during construction. One responsibility will be confirmation that the contractor is satisfying construction specifications dictating no ponded water, which would ensure that no new breeding conditions would be created during construction. The monitor would also be empowered to release small containers of water to eliminate breeding conditions as described for the Freshwater Alternative.

Under the Hybrid Alternative, the hydrologic regime of the lagoon would be partially changed from the existing freshwater system to a saltwater system. The hydrologic system west of I-5 would be influenced primarily by saltwater entering the system from an open tidal inlet during flood tides. The new tidal action and saline waters in those western basins that would result with implementation of the Hybrid Alternative would provide similar vector control improvements as described under the Saltwater Alternative, including a dynamic hydrologic cycle of tides that would interrupt the mosquito reproduction process, including increased salinity, which reduces

the ability of these vectors to reproduce; quick draw-down, which prevents establishment of stagnant ponds on the lagoon edges; habitat transition resulting in less dense stands of cattails that cannot survive the saline waters creating better circulation of water and improved effectiveness of vector control measures; and cooler ocean water that would create a poor temperature-based environment for larvae survival. Additionally, existing nutrient-rich soils currently cause the lagoon system to become eutrophic and create good breeding habitat/food for larvae. Large volumes of this soil (833,000 cy of sediment) would be removed as part of the Hybrid Alternative through shallow grading/dredging.

Post-construction habitats within the lagoon would be substantially modified under the Saltwater Alternative with the existing freshwater marsh and open water areas replaced with open freshwater habitat and fringing habitats east of I-5, and coastal salt marsh and open marine water areas west of I-5. This alternative would decrease habitats good for mosquito propagation and harborage (dense expanses of freshwater marsh) and increase unfavorable habitats for mosquitoes (open water, channels within marsh areas, tidal mudflats, regularly inundated/tidally drained areas). Approximately 148,500 cy of vegetation of vegetation (e.g., cattails) would be removed and would reduce the amount of aquatic vegetation available for larvae protection and would allow improved predator access.

In addition to the lagoon enhancement activities that would occur under this alternative, the adaptive management plan, detailed in Section 2.9 and described under the Freshwater Alternative, would also be implemented as part of the Hybrid Alternative and provide additional vector control measures post-construction.

As described above, implementation of the Hybrid Alternative would result in a less-conductive vector breeding condition and reduce the public health and safety risk associated with mosquito-borne diseases. Substantial increases in human exposure to vectors are not anticipated during construction or after implementation of this alternative. **Implementation of the Hybrid Alternative would not substantially increase human exposure to vectors, such as mosquitoes, that are capable of transmitting significant public health diseases or creating nuisances, and less than significant impacts would occur (Criterion D).**

Recreational Safety

Similar to the Saltwater Alternative, the Hybrid Alternative would create a new inlet that would modify the existing beach through permanent conversion of beach area to a new lagoon inlet open to tidal action. The opening of the tidal inlet channel across the beach would at times interrupt access along the beach due to water depth and velocity and intermittently render the inlet unsafe, both on a seasonal and daily basis (Everest c, d). Relative to the existing sandy

beach that currently exists, the open inlet across the beach could result in a new safety threat to recreational users in the inlet areas when unsafe conditions exist due to high water volumes or velocities within the inlet channel. Recreationalists could be tempted to cross the inlet in unsafe conditions as there is no other easily accessible north/south route along the beach. Thus, **operation of the Hybrid Alternative within the new inlet could result in a substantial permanent increase in hazards for people swimming, walking, or otherwise recreating in the proposed lagoon inlet, and impacts would be significant (Criterion E).**

As previously described, staging areas and access roads are dispersed in various locations around the lagoon as needed and would be sited at existing access points used by recreationalists to access the lagoon or beach area. **Standard design practices would protect recreationalists who access the lagoon and beach inlet area to ensure public safety is maintained, and impacts would be less than significant (Criterion E).**

Long-term Benefits

The Hybrid Alternative would provide public health and safety benefits through increased vector control due to the partial conversion of the hydraulic regime to saltwater and tidal influence. These conditions would not be conducive to vector breeding and lifecycle. The removal of dense vegetation and freshwater marsh would also decrease favorable vector habitat. This would be highly beneficial as the existing vector control methods currently used on the lagoon are rendered less effective by the large expanses of dense cattail vegetation. The adaptive management plan also specifies actions to provide ongoing reduction of breeding and lifecycle opportunities for vectors, resulting in a perpetual public health and safety benefit.

No Project Alternative

Under the No Project Alternative, impacts related to public health and safety, risks associated with hazardous materials, recreational activities, and wildland fires would remain similar to existing conditions as no construction activities would occur. **No impacts to these issues would occur (Criteria A, B, C, E, and F).**

The conditions at the lagoon associated with vectors would continue to decline without implementation of the Enhancement Project. Under the No Project Alternative, no improvements to circulation or strategic vegetation removal would occur. As sedimentation continues and vegetation encroaches into remaining open water areas within the lagoon, increased breeding habitat and more conducive life cycle conditions for vectors would develop. The rate and pattern of sedimentation and vegetation encroachment is speculative, and would influence the increase in more conducive life cycle conditions for vectors. Ongoing vector treatment by the SDCVCP

would continue, but with effectiveness impeded by the increasingly dense and expansive stands of vegetation. Maintenance of vegetation may occur intermittently by CDFW. Decreases in vector breeding habitat areas that would be provided under the various Enhancement Project alternatives would not occur under the No Project Alternative. With increases in vector breeding area and improved life cycle conditions, potential for exposure to ~~vector-borne~~vector-borne disease in the nearby communities would increase under the No Project Alternative, and **impacts to public health and safety would be significant (Criterion D).**

Materials Disposal/Reuse

The major difference between alternatives regarding the materials disposal/reuse component of the Enhancement Project is generally the volume of material anticipated to be placed at the various onshore, nearshore, and offshore locations. Beyond the varying material volumes, most elements of materials disposal/reuse would be similar for each of the alternatives as all could have similar placement site footprints and methods of transport from the lagoon to the placement/disposal sites. Because the volume of material proposed for disposal/reuse would not have a substantial influence on the analysis of hazardous materials and public safety issues, this section is not separated into individual alternatives; rather, the analysis is presented as one discussion with individual alternative conclusions identified at the end.

Hazardous Materials and Public Safety

For all Enhancement Project build alternatives, the sediment quality and contaminants analysis provided under the enhancement activities analysis is applicable to the materials disposal/reuse discussion, since the sediments removed from the lagoon would be disposed of or used for nearshore or onshore placement. The analyte-specific detection limits are considered appropriate for evaluating all possible disposal alternatives considered (SAIC 2008a). While pesticide and metal levels were detectable in lagoon material, concentration levels were all below the defined ERM thresholds and there are very limited pathways for human exposure. Therefore, these contaminants levels in materials proposed for reuse would not pose an adverse effect on human health (Everest 2014i, j) and these materials are chemically compatible for beneficial reuse options (nearshore or onshore). Material determined unsuitable for onshore or nearshore reuse does not have the appropriate grain size and percentage sand composition (Everest and Battelle 2003; SAIC 2008a) but is not unsuitable due to health concerns. **Therefore, potential health and safety risk associated with contaminants in dredged material would be less than significant (Criteria A and F).**

Material deemed not suitable for reuse would be disposed of on-site in an overdredge pit or off-site at LA-5, depending on the construction approach selected. Following placement of material

in the overdredge pit, flows through the lagoon are not anticipated to be high enough to reintroduce the sediments into the water column, and material would be effectively encapsulated on-site. If disposal at LA-5 were part of the selected alternative, additional Tier 3 testing would be completed to confirm material is suitable for disposal as part of the final Section 404 permitting authorization. Sediment samples would be expected to meet and exceed ocean disposal acceptance criteria (Everest and Battelle 2003). Thus, **disposal of material at the overdredge pit or LA-5 would not result in a substantial public health hazard from management or disposal of dredged/excavated material, and impacts would be less than significant (Criterion F).**

Similar to enhancement activities within the lagoon project site, materials disposal/reuse activities would involve construction equipment that would require a number of petroleum products such as fuel, hydraulic fluids, and lubricants for effective operation. Standard construction measures related to fuel replenishment, and staging areas, as well as regulatory requirements for an SPCC plan, would also be implemented for materials disposal/reuse operations. As required by law, storage, handling, transport, emission, and disposal of hazardous materials associated with construction activities would be in full compliance with local, state, and federal regulations, which provide requirements to ensure proper and appropriate actions specific to minimizing hazardous materials risk. Ongoing maintenance activities would be subject to these same safety precautions in an effort to minimize public safety hazards associated with heavy equipment operating in and around the lagoon. **Potential risk associated with the transport, use, or disposal of hazardous materials or location near a hazardous material site would be minimized, and impacts would be less than significant (Criteria A and B).**

Additionally, standard construction measures related to heavy equipment and construction area safety would be implemented for materials disposal/reuse activities, and would ensure public safety is maintained in publicly accessible areas near the onshore and nearshore placement sites, as well as the monobuoy. Thus, **the presence of construction equipment and work areas would not cause a substantial increase of public safety hazards, and impacts would be less than significant (Criterion E).**

Recreational Safety

Active construction areas are typically restricted to maintain public safety, as identified in Table 2-9. Portions of the beach directly affected by active materials placement activities may therefore be closed temporarily. Adjacent stretches of beach not directly affected by placement activities, such as those areas where the pipeline may extend but where sand is not directly being placed, would remain open to public access and recreational activities to ensure continued beach accessibility and availability. Depending on the beach site and material excavation rates, up to

1,000 feet of beach may be closed per day in a specific location. As sand placement activities move along the beach, areas where sand placement has been completed would be reopened to public use. Prior to opening areas of beach with placed materials, the material would be spread and checked for potential hazards (e.g., foreign objects in the sand) to minimize the potential for injury. Lifeguard services would remain during construction and sand would be placed to avoid blocking line-of-sight from lifeguard towers (PDF-7) to ensure lifeguards continue to have unobstructed views of the beach and water.

Ocean areas directly adjacent to sand transport/placement equipment and activities may also be temporarily closed to ensure public safety. Buffers around temporary monobuoys, pipelines, and ocean placement sites would be maintained to avoid water recreation users and vessel safety hazards. Additionally, standard construction practices identified in Table 2-9 would ensure public safety in open water is also maintained. Fueling and/or maintenance activities would occur at the staging areas away from the beach. An SPCC plan would ensure that spills would be cleaned up in accordance with permit conditions and that all employees would understand the proper procedures associated with a cleanup so that it would be carried out correctly.

Potential safety impacts due to increased scarp heights may occur. As a standard construction practice, marine safety departments in the Cities of Oceanside and Carlsbad post signs advising the public of the presence of scarps should they develop on the beaches where sand is being placed, so the public would be aware of the potential hazard and appropriately avoid the scarps. These scarps often occur naturally in the absence of beach nourishment and are usually short term and localized and would not be considered a significant effect of the project.

Ongoing maintenance activities related to materials placement from inlet maintenance would be subject to these same safety precautions in an effort to minimize public safety hazards associated with heavy equipment operating in and around the North Carlsbad beach site.

As described above, **recreational safety impacts associated with onshore and nearshore placement of materials would be less than significant (Criterion E).**

Vessel Safety

Materials could be disposed of in the offshore environment at LA-5, using a monobuoy and pipeline system to load a barge for transport of material to that site. The primary hazard associated with offshore or nearshore placement is vessel safety during the transport of materials. The potential for a vessel to collide with the barge or a support vessel would be remote as vessels would be equipped with markings and lights in accordance with established U.S. Coast Guard (USCG) regulations. The location and operational schedule of the monobuoy and barge would be

published in a USCG “Local Notice of Mariners” to inform local boaters of the presence and location of the barge and allow for advanced planning to avoid the area. The travel speed would also be slow (approximately 5 knots) during transport. To ensure that no vessels would enter the restricted zone around the monobuoy, the anchoring area would be included in the “Local Notice to Mariners.” Pipelines used in barge loading or sediment transport during offshore or nearshore placement, including both floating and submerged, would be clearly marked as “navigational hazards” consistent with standard construction practices (Table 2-9) to ensure high visibility and clear notice of hazards. There would be a short-term and localized increase in vessel traffic in the area associated with project construction with a limited distance of travel to set and remove the pipeline. The Enhancement Project would not create navigation hazards or result in unsafe conditions for vessel traffic. **Vessel safety impacts associated with offshore placement of materials would be less than significant (Criterion F).**

No Project Alternative

No materials would be placed offshore, nearshore, or onshore under the No Project Alternative. Thus, there would be no **impacts from the No Project Alternative related to public health and safety due to materials placement/reuse would be less than significant (Criteria A through F).**

3.15.4 MITIGATION MEASURES

Significant impacts to public recreational safety would result from operation of the Saltwater and Hybrid Alternatives with the new inlet crossing of the beach that could create a safety threat to recreational users during certain tidal conditions of high water volume and velocities.

To reduce potential safety impacts associated with this inlet crossing, the Saltwater and Hybrid Alternatives will implement the following mitigation measure:

Safety-1 During and following the construction of the new beach inlet, signs will be posted near the inlet to inform beachgoers of the dangers of inlet crossing.

Implementation of Mitigation Measure Safety-1 would reduce the public safety impact of the Saltwater and Hybrid Alternatives, but this impact would remain significant. No additional feasible mitigation measures are available to improve permanent recreational safety associated with high water volume/velocities in the newly created open inlet across the beach under the Saltwater and Hybrid Alternatives inlet. As detailed in Section 3.1.4 in the Land Use and Recreation section, Mitigation Measure Land Use -1 would require a pedestrian bridge to be constructed at a feasible location to allow safe and convenient access across the inlet. While that

mitigation would substantially improve public safety associated with the new inlet as it would provide a way for beach users to safely cross the inlet during times of high water levels and velocities, the overall inherent danger of the new inlet during certain conditions would remain for those uninformed persons or those tempted to cross even during unsafe situations. Thus, public safety impacts associated with operation of the new tidal inlet under the Saltwater and Hybrid Alternatives would remain significant and unavoidable.