3.13 Public Safety and Hazards

This section evaluates the potential impacts of the Proposed Action related to public safety and hazardous materials. This evaluation includes an assessment of the direct, indirect, short-term, long-term, and cumulative effects of the Proposed Action on potential use, transport, and release of hazardous materials; presence of hazardous materials sites; flooding, including the issue of dam failure; and recreational accidents. The hazardous materials evaluation is based on two hazardous materials reports prepared by Rincon Consultants (2006), which are included as Appendix F to this EIR/EIS.

3.13.1 Affected Environment

3.13.1.1 Environmental Setting

The following discussion describes the existing public safety conditions and hazardous materials within the SV 100K study area.

Dam Safety

The area downstream of San Vicente Dam includes the San Vicente Creek and San Diego River watersheds. Water released or spilled from the reservoir flows down San Vicente Creek in Moreno Valley. Approximately three miles downstream of the dam, the creek reaches its confluence with the San Diego River, just west of SR-67 and north of the City of Lakeside. The San Diego River, in turn, passes through Mission Gorge and Mission Valley before it reaches the Pacific Ocean near Mission Bay. The river crosses under many major transportation bridges along its path to the ocean, including SR-67, SR-52, I-15, I-805, SR-163, and I-5. The total travel distance is approximately 26 miles.

The City of San Diego has developed an Emergency Response and Evacuation Plan (EREP) for the existing San Vicente Dam. This plan is on record at the City of San Diego, the San Diego County Office of Emergency Services, and the State Division of Safety of Dams (DSOD). An integral part of the EREP is the dam break flood inundation mapping. The inundation study for the existing dam was completed in 1974. Inundation maps are on file and can be viewed at the San Diego County Department of Public Works (Lakman, 2006).

The San Vicente Dam EREP contains the following elements:

- Assignment of responsibility
- Notification methods and procedures
- Emergency communications
- Public education and information
- Emergency facilities and equipment

- Accident assessment
- Protective response
- Medical and public health support
- Recovery and reentry planning and post-incident operations
- Exercises and drills
- Responsibility for the planning effort

Recreational Safety

Refer to Section 3.15.1.1 (Recreation for the Proposed Action) of this EIR/EIS for a description of existing recreational uses at San Vicente Reservoir and hours of operation. To facilitate recreational use of the reservoir and promote boating safety, the City has established priority times for conflicting uses such as waterskiing and fishing. During the "summer" months (i.e., May through October), waterskiing is permitted Thursday through Sunday, and fishing is permitted on Thursday and Friday. In the "winter" months (i.e., November through April), waterskiing is permitted on Thursday and Friday, and fishing is permitted Thursday through Sunday.

The busiest days on the lake generally occur on summer weekend days when water contact sports are permitted. Because San Vicente Reservoir is only one of two lakes in the County that allow water contact activities, water ski boats account for a large majority of the recreational use. Each water ski boat requires approximately 10 acres of reservoir surface area for safe operation. To maintain public safety, lake managers limit the number of water ski boats allowed on the reservoir at any one time based on the surface area of the reservoir. (Weber, 2006)

For safe operation of fishing boats, approximately one acre of reservoir surface area is required per boat. Therefore, the total number of available parking spaces is what limits the number of fishing boats on these days.

Because swimming and the use of personal watercraft are prohibited at the reservoir, the average annual risk of death from boating accidents is a likely representation of the risk associated with the current recreational uses of San Vicente Reservoir. According to the 2006 California Boating Safety Report produced by the California Department of Boating and Waterways (CDBW), a total of 757 boating accidents were reported throughout the state in 2006, involving 445 injuries and 42 fatalities, or approximately 4.7 fatalities per 100,000 registered boats (CDBW, 2006). In 2004, San Vicente lake management catalogued the purchase of 40,500 boat launch permits and approximately 10,000 boat rental permits. Based on the 2006 CDBW statistics and 2004 San Vicente boat use, there is a risk of one fatality occurring every two years at the San Vicente Reservoir. However, records from the CDBW show that San Vicente Dam is well below the average for California reservoirs. Over the five-year period from 2000 to 2004, there were a total of 15 boating-related accidents at the reservoir with 10 reported injuries and no reported fatalities. Based on this information, it appears that the City's operation of the reservoir promotes a satisfactory level of public safety, and it can be assumed that as long as these operational constraints are maintained, there will be continued protection of public safety.

Hazardous Materials

The construction zone and inundation area are in a rural residential and agricultural area. Prior to the construction of the San Vicente Dam in 1941, the area also included the end-of-the-line for the railroad serving eastern San Diego County. The primary use of the project site property is to support water impoundment via the San Vicente Dam and water-related recreation activities. An operations yard is situated near the base of the dam and includes the administrative offices for Lakes Recreation. A paved parking lot and public restrooms are located near the boat dock and the marina.

Rincon Consultants performed a reconnaissance to assess whether current practices or land uses involving the use, storage, treatment, generation, or disposal of hazardous substances may be taking place within the immediate area of the SV 100K inundation limits and downstream dam construction zone (Rincon, 2006). During site reconnaissance in 2006, Rincon Consultants did not observe above-ground tanks or evidence of underground storage tanks, hazardous materials associated with San Vicente Dam and reservoir operations, unidentified substance containers, or transformers. In addition, according to Nelson Manville, Lakes Program Supervisor for the City of San Diego Water Department, there have been no above or below ground storage tanks on the property.

3.13.1.2 Regulatory Setting

The following discussion addresses federal, state, and local laws and policies relevant to public safety conditions of the Proposed Action.

Federal

The Resource Conservation and Recovery Act (RCRA) of 1976 is the primary law regulating the handling of hazardous waste, which includes waste generated during environmental cleanup.

State Dam Safety

Enlargement of San Vicente Dam would be under the jurisdiction of the DSOD. Existing and raised San Vicente Dam would meet the definition of dams in California Water Code Section 6002, as it would have a height of 25 feet or more and would have an impounding capacity of 50 acre-feet (AF) or more (California Water Code, Div. 3, Pt. 1, Sec. 6002). Since 1929, the State of California has supervised dams to prevent failure for the purpose of safeguarding life and protecting property. Construction of any new dam or reservoir, or the enlargement of any dam or reservoir, cannot proceed until written approval of plans and specifications has been obtained from DSOD.

Also, in accordance with California Office of Emergency Services (OES) requirements, operators of water reservoirs are required to prepare an Emergency Response Plan for the event of a catastrophic dam failure (Lobato, 2006). Part of this plan includes the performance of

simulated dam break analysis to assess the real extent and hydraulic characteristics of flooding, such as water velocity, depth, and flood wave arrival time at various locations. As stated above, the San Vicente Dam EREP is on file at the City of San Diego, the San Diego County Office of Emergency Services, and DSOD.

State and Local Recreational Safety

In accordance with the California Health and Safety Code, Section 115840, incidental body contact with reservoir water is conditionally allowed with respect to recreational uses in domestic water supply reservoirs within San Diego County; however, swimming is not allowed at San Vicente Reservoir.

In accordance with the City of San Diego's Water Reservoir Permit, one to two safety officers patrol San Vicente Reservoir during operating hours. The safety officers enforce boat safety and attend to medical emergencies. The number of safety officers provided depends on the number of visitors. During the summer months, when approximately 800 people could visit the reservoir each day, two safety officers are able to manage patrols (Weber, 2006).

3.13.2 Project Design Features

General Conditions and Standard Specifications that will be included in the project construction documents to reduce public safety and hazards impacts associated with construction of the Proposed Action are summarized in Section 1.9.6 (Introduction, Public Safety and Hazards) of this EIR/EIS. In addition, the Proposed Action would include design features to minimize public safety and hazards impacts. These design and construction features could include, but would not be limited to, the following:

- Prior to initiation of construction, all construction personnel will be trained in the requirements of a Fire Prevention and Response Plan. The plan will outline the responsibilities for the prevention, pre-suppression, and suppression activities associated with fire within the Proposed Action construction area. Fire safety information will be disseminated to construction crews during regular safety meetings. Fire management techniques will be applied during project construction, as deemed necessary by the Water Authority and depending upon the vegetation on site and in surrounding areas.

- The Contractor will be required to conduct ongoing worker training for all levels of construction personnel, including weekly safety meetings.

- Instrumentation will be provided in the raised San Vicente Dam to monitor hydraulic pressures and deformations in the dam. The existing EREP will be reviewed and updated to satisfy the new requirements resulting from the dam expansion.

- The raised dam will be designed for a safety goal of one in a million, as was proposed for the ESP dam raise. A safety goal of one in a million means that, if there were one million

dams constructed to similar standards located in a geologic and hydrologic independent area, on average, one of the million dams would fail each year. This safety goal is consistent with the performance goals set by other states and agencies for high hazard structures such as dams and nuclear facilities. A safety goal of one in a million will ensure that risks to the public from a potential dam failure are minimized; a certain reliability is provided; the expanded dam would not add substantially to the prevailing public risk; and the reliability of new construction is better than the prevailing historical trend.

3.13.3 Direct and Indirect Effects

3.13.3.1 Thresholds of Significance

Thresholds used to evaluate potential public safety impacts are based on applicable criteria in the State CEQA Guidelines (CCR §§15000-15387), Appendix G; the ESP EIR/EIS; and the RWF Master Plan PEIR. A significant public safety impact would occur if the Proposed Action would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
2. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
3. Be located 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, would create a significant hazard to the public or the environment.
4. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
5. Increase boating accidents due to increased recreational use of any reservoir.

3.13.3.2 Impact Analysis

Methodology

Review of Historical Land Uses and Reported Hazardous Waste Sites

Various methods were used to locate potentially hazardous materials or identify previous uses on site that may have created a hazardous condition at some time in the past. A database search of public lists of sites that generate, store, treat or dispose of hazardous materials, or sites for which a release or incident has occurred, include:

- State Water Resources Control Board (SWRCB) Underground Storage Tank

- SWRCB Leaking Underground Storage Tank
- USEPA's Resource Conservation and Recovery Act INFO
- Integrated Waste Management Board's Solid Waste Information System
- Federal National Priorities List
- Comprehensive Environmental Response, Compensation, and Liability Information System L.8 Site/Event
- California Hazardous Waste Generators, Treatment, Storage & Disposal Facilities
- California OPR Hazardous Waste and/or Substances Sites
- San Diego County Department of Health Services

In addition, the County of San Diego Department of Environmental Health was contacted and a review of the California Division of Oil and Gas records was conducted. Historical and current aerial photographs and topographic maps were also reviewed for information related to the SV 100K study area.

Hazardous Materials Field Reconnaissance

Rincon Consultants performed a reconnaissance of the site on September 30, 2005. The purpose of the reconnaissance was to assess whether current practices or land uses involving the use, storage, treatment, generation, or disposal of hazardous substances may be taking place within the immediate area of the SV 100K inundation limits and downstream dam construction zone. In addition, an environmental questionnaire was completed by Mr. Nelson Manville, the Lakes Program Supervisor for the City of San Diego Water Department regarding the types of hazardous materials that are stored or used on site.

Dam Failure Simulation Analysis

The probability and consequences of a simulated dam break have been evaluated for the existing San Vicente Dam and for the ESP dam raise. The analysis includes identification of land uses that could be impacted by floodwaters. The following summarizes a similar analysis performed by GEI for the expanded reservoir under the Proposed Action (GEI, 2007c).

GEI completed the dam inundation simulation and mapping following OES inundation mapping regulations. The results of the analysis include: (1) an estimate of the area that may be flooded in the event of a dam failure; (2) peak flood depth; (3) peak water flow; (4) maximum flow velocity; and (5) the time of arrival of the peak flood depth as a function of distance from the dam.

In evaluating the potential for significant adverse impacts on downstream land uses and public safety, a conservative (worst-case) approach was followed to ensure that the potential impacts would not be underestimated. This conservative approach included the assumptions that San Vicente Dam would completely fail during a probably maximum flood (PMF) event, releasing its entire contents downstream. However, the probability of a dam failure for a modern dam is

extremely low, given modern dam design methods and construction techniques. The Proposed Action dam raise would be designed with a safety goal of one in a million, which is more conservative than the historical dam failure frequencies in the U.S.

Based on the SANDAG land use database, four basic land use categories were identified to evaluate the potential for adverse impacts associated with a simulated dam failure. The four categories are defined as follows:

1. Highly sensitive land uses include schools, hospitals, convalescent homes, day care centers and other buildings; and areas where large numbers of people concentrate, who because of their age or physical condition, may require assistance to evacuate.
2. Urban land uses include residential, commercial and industrial areas.
3. Rural land uses include agricultural areas (e.g., farms, orchards, and nurseries).
4. Open space includes undeveloped land, golf courses, and beaches.

The simulated flood inundation area between the dam and the Pacific Ocean was plotted on USGS 7.5-minute quad maps; these maps are on file at the Water Authority offices. The estimated time of arrival of the wave front was used to assess whether adequate time would be available to evacuate or to take other emergency response measures to protect the public health and safety.

Analysis

Threshold 1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

A limited amount of hazardous materials (paints, solvents, petroleum products, etc.) would be used or stored in association with construction and operation of the Proposed Action. Transportation, use, or disposal of hazardous materials during construction, operation, and maintenance of the proposed facilities could pose potential health and safety hazards to construction and maintenance workers, nearby residents, and the environment. These impacts would be associated with the potential for spills on the construction site, during operation, or along access roads, and improper disposal of hazardous materials.

The City's Hazardous Materials Business Plan created for the San Vicente Reservoir established procedures for proper storage and use of hazardous chemicals. City staff who work at the reservoir are required to attend annual hazardous materials training. Training includes instruction on how to properly store and handle chemicals to avoid spills and what to do if a spill or human contact with the chemical occurs. In addition, safety measures would be implemented in accordance with the Water Authority's General Conditions and Standard Specifications (refer to Section 1.9.6 [Introduction, Public Safety and Hazards] of this EIR/EIS), and project design features would be incorporated into plans and specifications, as described above in Section 3.13.2 above. These measures would reduce the risk of upsets during construction, including

accidental explosions or releases of hazardous substances. Therefore, public safety or environmental impacts due to routine transport, use or disposal of hazardous materials during construction and operation of the Proposed Action would be less than significant.

The Proposed Action would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Safety measures would be implemented to control the routine transport, use, or disposal of hazardous materials during project construction and operation. Therefore, impacts of the Proposed Action would be less than significant.

Threshold 2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

A reasonable amount of hazardous materials would be associated with operation of the Proposed Action, including gasoline, motor oil, grease, etc. As discussed under Threshold 1 above, the implementation of safety measures from the Water Authority's General Conditions and Standard Specifications and from the project design features (Section 3.13.2 above) would be incorporated into plans and specifications to reduce the risk of upsets during construction, including accidental explosions or releases of hazardous substances. Therefore, public safety or environmental impacts due to reasonably foreseeable upset and accident conditions of hazardous materials during the construction or operation of the Proposed Action would be less than significant.

The Proposed Action would not create a significant hazard to the public or the environment due to a reasonably foreseeable or accident condition resulting in the release of hazardous materials into the environment.. Safety measures would be implemented to prevent upsets during construction and operation. Therefore, impacts of the Proposed Action would be less than significant.

Threshold 3: Be located 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, would create a significant hazard to the public or the environment

A review of the pertinent hazardous materials lists by Rincon (refer to Methodology Section above), indicates there are no known hazardous materials sites from current or past operations or uses within, and directly adjacent to, the SV 100K study area. In addition, the field reconnaissance did not detect the presence of hazardous materials on site.

A total of 15 hazardous waste sites were reported to the southwest of the SV 100K study area; none of these facilities are adjacent to the dam construction zone. In addition, none of these sites were found to be a threat to human health and safety and the environment.

Based on a review of historical documents, no historic or hydraulically up-gradient land uses were observed that indicated the use, storage, or disposal of hazardous materials, which could impact the SV 100K footprint.

The Proposed Action would not be located on any areas affected by hazardous materials. Therefore, there would be no impact due to the Proposed Action.

Threshold 4: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

Construction of the Proposed Action involves the raising and strengthening of the existing San Vicente dam. Strengthening the dam would decrease the probability of a flood occurring as a result of dam failure. The following section discusses the likelihood and expected impacts of flooding due to dam failure and reservoir spills due to overtopping of the spillway.

Likelihood of Dam Failure

Historical dam failure frequencies in the U.S. have been estimated as 31 in a million for concrete dams and 35 in a million for rockfilled dams (GEI/CDM, 1996). The Proposed Action dam raise would be designed with a safety goal of one in a million, which is more conservative than the historical dam failure frequencies.

Given modern dam design methods and construction techniques, dam failure is extremely low. In California, the DSOD is responsible for approving the design and monitoring the construction of new dams. New dams must meet stringent design criteria that cover a variety of possible conditions that could affect the dam, such as earthquakes and flood events, without taking probability factors into account. The raised San Vicente Dam will be designed to withstand maximum credible earthquakes on active faults in the region. The earthquakes that govern the design were determined to be a Magnitude 6.7 earthquake on the La Nacion Fault zone located about 12 miles west of the dam, and a Magnitude 7.5 earthquake on the Elsinore Fault zone located about 22 miles east of the dam.

Of the few dam failures that have occurred in the past 30 years in the U.S., the cause has often been poor design or poor construction, causing the dam to fail during the initial reservoir filling. With state-of-the-art design and construction practices, combined with stringent DSOD criteria and review, such an event is extremely low.

When designing and constructing expanded or new dams, engineering design and construction techniques that reduce the likelihood of the development of cracking of the dam face are applied. RCC is an inherently strong material, which, when placed properly, behaves like a cohesive, monolithic mass. Therefore, the probability of developing a crack through the dam that leads to a dam breach is extremely low. Implementing proper construction techniques, as well as proper construction quality assurance and quality control procedures would enhance the quality of the RCC dam and reduce the probability of catastrophic dam failure. Therefore, flooding impacts due to the risk of dam breach due to the Proposed Action would be less than significant.

Impacts from Catastrophic Dam Failure and Subsequent Flooding

OES has inundation mapping regulations for dams whose failure would pose a threat to the health and safety of the public. Although these studies are required to satisfy OES regulations, the probability of a dam failure for a modern dam is extremely low. The consequences of a simulated catastrophic failure at San Vicente Dam were assessed based on a comparison of the downstream flood zones under existing conditions and the simulated zones for the Proposed Action. It was assumed that a complete breach of the dam would develop within 15 to 30 minutes after a triggering event, such as catastrophic cracking. Table 3.13-1 provides the hydraulic flood routing data for selected locations of the simulated dam break analysis for the Proposed Action.

Table 3.13-1. Simulated Dam Break Flood Data, San Vicente Dam

Distance from Dam Face (miles)	Sample Location [1]	Time to Start of Flood (minutes)	Time to Arrival of Flood Peak (minutes)	Maximum Elevation at Peak [2] (feet AMSL)	Maximum Flood Wave Height (feet above channel bottom)	Maximum Flow at Flood Peak (cfs)	Maximum Velocity of Flow (fps)
3.25	1	~~20~~19	55	420.1	20	~~793,000~~792,500	18.8
4.92	2	31	80	397.0	47	~~764,300~~763,700	10.4
9.73	3	~~60~~59	185	348.3	62	~~578,600~~578,300	7.9
15.81	4	116	210	~~100.6~~100.5	45	~~570,200~~569,900	12.7
20.16	5	152	265	57.3	41	~~556,000~~555,600	7.1

[1] Sample Locations: 1 = approximately 500 feet south of El Capitan High School; 2 = Intersection of Riverford and SR-67; 3 = KFMB radio tower; 4 = Intersection of Friars and Mission Gorge Roads; 5 = Fashion Valley Mall.
[2] The maximum water surface elevation is the topographic height expressed as feet above mean sea level. See next column for height of water expressed as feet above the channel bottom.
Source: GEI 2007c (revised April 2008)

A dam break process can develop within a relatively short time and could cause the release of the majority of water stored in a reservoir behind a dam. Flow velocities, especially near the failing dam, would usually be extremely high because of the high hydraulic head or elevation of the water behind the dam. The released water from a dam break would travel as a large wave downstream. Forces on structures along and within the wave path would primarily be impact forces, similar to those usually expected in a coastal environmental from high-velocity waves. Because most traditional structures outside of the coastal zone are not designed and constructed to withstand large lateral impact forces, the extent of damage to structures, buildings, and infrastructure from a dam break wave would be extensive.

This type of flooding is different from a 100-year flood event, which is commonly used to measure flooding hazards. During a 100-year flood event, which results from extended precipitation over the watershed, the water levels increase at a relatively slow rate. The buildup of a 100-year flood requires precipitation over an extended period of time, causing the saturation of soils within the watershed, and a subsequent increase in surface runoff. The surface runoff

gradually builds over the entire watershed and travels to the tributaries and finally to the stream. Flow quantities and velocities increase gradually depending on the topography of the watershed. Forces on structures along and within the stream also increase gradually as water levels and velocities increase. Damage to buildings is primarily associated with the increasing hydrostatic pressure associated with the rising water levels and debris carried by the water.

Considering the quantity of water released from a dam if the dam should fail, and the relatively short time period over which the release occurs, the consequences of dam break flooding and the dynamic forces exerted by the rapidly traveling flood wave are generally regarded as catastrophic. The main consequences of this flooding are loss of human life, loss to property, and loss to infrastructure.

Loss of Human Life

For highly sensitive land uses such as hospitals and other medical facilities, a large number of people are expected to be present at all times, and most would require assistance to evacuate in the highly unlikely event of a dam failure. For other highly sensitive land uses such as schools, business areas, and residential areas, the presence of people is more time dependent. There is no way to predict when a dam break would occur; therefore, benefit cannot be drawn from the fact that some highly sensitive land uses such as schools are empty some of the time.

In urban land use categories, a large number of people are expected to be concentrated. In the rural land use category, a substantially smaller population is expected, mainly workers and rural residents. In open space areas, the number of people can be expected to be relatively small, including tourists, hikers, beachgoers, golfers, and others.

Considering the short travel time of most dam break floods, warning times could be limited. Therefore, many of the people in the flood area may not be able to be evacuated in advance of the flooding. Though no quantitative estimates have been made, the loss of human life in the sensitive and urban land use categories would be expected to be high, while in rural and open space land use categories loss to human life would be expected to be less.

Loss to Property

In the urban land use categories, which comprise residential as well as business, industrial and commercial areas, dam break flooding is expected to cause a very high level of property loss. The immediate loss would primarily include loss of buildings, livestock, and crops. Loss to property in open space areas is expected to be less, but environmental damage could be substantial.

Loss to Infrastructure

The large flow velocities during flooding would be expected to cause scouring and erosion in many areas. Erosion of unprotected, exposed areas would cause soil and vegetation loss, which could cause long-term damage to the vegetation-carrying capacity of land. Scouring along the dam break flood zone and around pipes, utilities, roads, railroads, and bridges crossing the flood zone could cause substantial damage to these structures. Damage to infrastructure would greatly

obstruct evacuation and restoration efforts and would also contribute to the economic loss caused by the dam break flooding.

The impact of flooding from a catastrophic event would be significant. However, the probability of such an event must also be considered in determining significance; for the Proposed Action the probability for dam failure is one in a million. Therefore, risk of dam failure due to the construction and operation of the Proposed Action would be less than significant.

Impacts from Overtopping of the Spillway and Subsequent Flooding

During very large and prolonged storm events, overtopping of the proposed San Vicente Dam spillway and subsequent downstream flooding is possible. However, such events would occur less frequently, and would be less severe in terms of volume, than under existing reservoir conditions. In 2005, Parsons conducted a hydrologic analysis that simulated 100-year storm flows overtopping the San Vicente Dam. Results determined that overtopping of the proposed SV 100K Dam would produce 46 percent less flood flow than the existing reservoir. The proposed dam raise would create additional storage volume which would result in increased storm flow detention, ultimately reducing the 100-year storm flow rate. In addition, the Water Authority and the City of San Diego would be required to design and implement a Reservoir Regulating Plan to regulate the water levels in the reservoir based on changing conditions. Therefore, downstream flooding impacts as a result of the Proposed Action would be less than significant.

The Proposed Action dam raise would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam or overtopping of the spillway. Therefore, impacts of the Proposed Action would be less than significant.

Threshold 5: Increase boating accidents due to increased recreational use of any reservoir

The types of recreation allowed at San Vicente Reservoir would not change as a result of the Proposed Action, but the volume of use would increase with the larger reservoir surface area. This increase in the intensity of recreational uses at the expanded reservoir is evaluated below for public safety issues.

After the completion of the Proposed Action dam raise and marina construction, San Vicente Reservoir will again offer a wide range of boating activities including sailboats, powerboats, row boats, inflatable boats, and rental power boats. Boating would be restricted to daylight hours only. Waterskiing would continue to be permitted under the same rules that apply to the existing reservoir. Swimming or other direct body contact with the reservoir water would not be permitted.

Under the Proposed Action, the maximum surface area of the reservoir would increase from 1,083 acres to 1,667 acres at maximum normal pool (MNP). The City operates the reservoir in such a manner as to only allow the number water ski boats at one time based on a surface area ration of approximately 10 acres per boat to ensure safe boating operations (Weber, 2006).

Based on this criterion, a maximum of 166 water ski boats could use the expanded reservoir at the highest water level any one time (refer to Table 2.2-2 [Alternatives Analyzed] of this EIR/EIS). On "fishing only" days, based on the total number of parking spaces planned for the new marina, the maximum number of all types of boats (sailboats, powerboats, row boats, inflatable boats, and rental power boats) allowed on the expanded reservoir at any one time would be 291. Lake managers estimate that the total number of boats using the reservoir per day may be 1.5 times the total number of boats allowed on the reservoir at any given time. Therefore, total number of boats using the reservoir per day could reach 249 boats on water ski only days and 437 on fishing only days. The duration of time the reservoir would be at the MNP level is dependent on daily and seasonal operations. Assuming a conservative average of four persons per boat, an approximate daily maximum of 1,000 persons could use the reservoir on water ski only days (compared to the existing rate of 450 persons per day), and 1,800 persons could use the reservoir on fishing only days. Based on the historic use of San Vicente Reservoir, the reservoir would only be expected to actually reach maximum capacity on water ski only days. Therefore, 1,000 persons is a realistic estimate of the expected maximum daily use of the San Vicente Reservoir (as compared to the existing rate 450 persons per day) . Two safety officers would be required for this intensity of use, which is the same as is required under existing conditions (Weber, 2006). Therefore, the Proposed Action would not result in a significant increase in the number of safety officers needed to patrol the additional recreational boating use at the expanded reservoir.

Compared to the existing marina operations, the Proposed Action would not result in different recreational boating activities at the reservoir, nor increase the minimum reservoir surface area required for safe water ski boat operation (10 acres per boat). Therefore, the probability of a boating accident at the expanded reservoir would remain the same as under existing conditions as long as the City maintains a safety limit of 10 acres per water ski boat. Therefore, the Proposed Action would not increase the risk of boating accidents, and the potential public safety impacts due to increased recreational use of the reservoir would be less than significant.

Figure 2.2-~~7~~8 shows that the inundation level in the Kimball Valley arm of the expanded reservoir would not extend into, or even up to, private properties beyond City of San Diego lands. Nevertheless, the Water Authority and City of San Diego have agreed to evaluate measures to discourage direct public access into the Kimball Valley arm of the reservoir and onto private properties in Kimball Valley, including but not limited to, signage, a tamper-proof buoy line (floating barricade) at the mouth of Kimball Valley Creek, etc. Such measures would reduce the potential for nuisance effects caused by recreational boaters on private properties in Kimball Valley. Therefore, impacts due to the Proposed Action would be less than significant.

The Proposed Action would generate a negligible increase in boating accident potential due to increased recreational use of the San Vicente Reservoir. Therefore, impacts of the Proposed Action would be less than significant.

3.13.3.3 Mitigation Measures

Impacts related to public safety and hazardous materials would be less than significant. Therefore, no mitigation measures are required.

3.13.3.4 Residual Impacts after Mitigation

No residual impacts would occur.

3.13.4 Cumulative Effects

3.13.4.1 Other CIP Projects

As described in Section 3.2 (Cumulative Projects for the Proposed Action) of this EIR/EIS, it was determined that the Slaughterhouse Terminal Reservoir would be the only CIP project with the potential to contribute cumulative impacts when combined with the Proposed Action since they are located within two miles of one another. The PEIR for the Regional Water Facilities Master Plan concluded that construction, operation, and maintenance of this Water Authority water infrastructure project could pose a risk to public safety by increasing the potential for wildfires, exposing workers or the public to hazardous materials, and increasing the potential for acts of vandalism or sabotage to critical public facilities. The PEIR outlined several mitigation measures that would be implemented to reduce the potential significance of these impacts to a less-than-significant level. The potential for project-related fire hazards would be mitigated through the development and implementation of Fire Prevention Programs or Emergency Response Plans (ERP) for each project, as necessary, in consultation with local fire protection services. Risk of exposure to hazardous material would be mitigated through: through investigation of potential project site prior to construction; clean up of known contaminated sites; use of proper personal protective equipment; proper use, handling, and storage of hazardous materials to prevent spills; and adequate ERPs that would be implemented in the event of a release or spill. Sabotage and vandalism would be mitigated through implementation of security-related measures, such as, fencing, secured entryways, alarms and surveillance. The above conclusions regarding cumulative public safety and hazardous materials impacts for the CIP project described above are incorporated into the cumulative public safety and hazardous materials analyses in Section 3.13.4.3 below.

3.13.4.2 ESP Projects

The ESP EIR/EIS concluded cumulative public safety impacts would not be significant. The above conclusions regarding public safety impacts for the ESP projects are incorporated into the cumulative public safety and hazards analyses in Section 3.13.4.3 below.

3.13.4.3 Other Planned Projects with CIP and ESP Projects

This section evaluates the cumulative public safety impacts of the Proposed Action when considered in conjunction with the other planned projects listed in Table 3.2-1 (Section 3.2 [Cumulative Projects] of this EIR/EIS], and incorporates the cumulative impacts associated with the CIP and ESP projects described in the above sections. The following cumulative analysis addresses each of the five significance thresholds listed in Section 3.13.3 above.

Cumulative Threshold 1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

Routine transport, use and disposal of a limited amount of hazardous materials would occur during construction and operation of the Proposed Action. However, safety measures would be implemented in accordance with the Water Authority's General Conditions and Standard Specifications (refer to Section 1.9.6 [Introduction, Public Safety and Hazards] of this EIR/EIS), and project design features would be incorporated into plans and specifications, as described above in Section 3.13.2 above. These measures would reduce the risk of upsets during construction, including accidental explosions or releases of hazardous substances. The cumulative projects in the vicinity of the Proposed Action include five mining projects and a number of residential subdivisions (refer to Figure 3.2-1). Construction and operation of these cumulative projects may require the use or transport of hazardous materials such as gasoline, solvents, paint, cleaners, etc. However, each cumulative project included in this analysis (Table 3.2-1), and the CIP projects and ESP project components in the vicinity of the Proposed Action would be required to conform to federal, state and local requirements for hazardous materials handling and storage. Therefore, cumulative public safety impacts due to construction and operation of the Proposed Action, when combined with hazardous materials transport, use and disposal from the CIP, ESP, and other planned cumulative projects listed above, would be less than significant.

Cumulative Threshold 2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment

Implementation of safety measures from the Water Authority's General Conditions and Standard Specifications, and from the project design features, would be incorporated into plans and specifications of the Proposed Action to reduce the risk of upsets during construction, including accidental explosions or releases of hazardous substances. The cumulative projects in the vicinity of the Proposed Action include five mining projects and a number of residential subdivisions (refer to Figure 3.2-1). Safety measures to avoid upset and accident conditions involving hazardous materials would also be expected to be incorporated into these cumulative projects and the CIP projects and ESP project components in the vicinity of the Proposed Action. Therefore, cumulative public safety impacts due to construction and operation of the Proposed Action, when combined with risk of upset of hazardous materials or accident conditions impacts from the CIP, ESP and other planned cumulative projects listed in Table 3.2-1, would be less than significant.

Cumulative Threshold 3: Be located 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, would create a significant hazard to the public or the environment

The Proposed Action would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The Proposed Action would not contribute to the cumulative release of listed hazardous materials into the environment. Therefore, impacts would be less than significant.

Cumulative Threshold 4: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

Construction of the Proposed Action would improve the strength of the San Vicente Dam, reducing the probability of a catastrophic dam failure and an associated downstream flooding event. The proposed dam raise would actually create additional storage volume, which would result in increased storm flow detention, as well as a 46 percent reduction in the 100-year storm flow rate (Parsons, 2005). Other cumulative projects in the vicinity of the Proposed Action include five mining projects and a number of residential subdivisions (refer to Table 3.2-1). None of these projects would involve construction of a dam. These projects would involve construction of additional impervious surfaces or other features that may increase the severity of larger floods within the San Vicente watershed and downstream of the San Vicente Dam. However, even in the unlikely event that the San Vicente Dam was breached, these cumulative projects, as well as the CIP projects and ESP components in the vicinity of the Proposed Action, would not substantially contribute to the cumulative flooding impact. Therefore, cumulative public safety impacts due to construction and operation of the Proposed Action, when combined with risk of flooding impacts from the CIP, ESP, and other planned cumulative projects listed in Table 3.2-1, would be less than significant.

Cumulative Threshold 5: Increase boating accidents due to increased recreational use of any reservoir

The cumulative projects in the vicinity of the Proposed Action include five mining projects and a number of residential subdivisions (refer to Figure 3.2-1). Construction of the residential housing project would increase the population in the vicinity of the San Vicente Reservoir and may attract more people to boat at the reservoir. However, boating and waterskiing would continue to be permitted under the same rules that apply to the existing reservoir. To maintain a safe boating environment, City staff restrict the number of water ski boats that can use the reservoir at any given time (refer to Section 3.13.3.2 above). In addition, the CIP projects and ESP components described above would not increase the recreational use of any reservoir. Therefore, cumulative public safety impacts due to construction and operation of the Proposed Action, when combined with risk of increased boating accidents due to the CIP, ESP, and other planned cumulative projects listed in Table 3.2-1 (Cumulative Projects for the Proposed Action) of the EIR/EIS, would be less than significant.

The Proposed Action would implement safety measures to control and prevent upset of hazardous materials when transported, used, or disposed of during construction and operation. The Proposed Action would not be located on any areas affected by listed hazardous materials. The Proposed Action dam raise would be designed with a safety goal of one in a million, which is more conservative than the historical dam failure frequencies in the U.S. As such, the probability of a catastrophic dam failure and associated downstream flooding event would be extremely low. The Proposed Action would generate a negligible increase in boating accident potential due to increased recreational use of the San Vicente Reservoir. Therefore, cumulative public safety impacts due to the Proposed Action for these activities, when combined with the short-term (construction-related) and long-term (operational) public safety impacts associated with the Slaughterhouse Terminal Reservoir (CIP), ESP project components, and other planned cumulative projects listed in Table 3.2-1, would be less than significant.

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