Hahamongna Watershed Park Master Plan

Appendix E:

SUMMARY OF PROPOSED PROJECTS

Prepared by City of Pasadena Parks and Natural Resources Division

DEVIL'S GATE DAM AREA

New Parking Area

A small landscaped parking area will be constructed at the intersection of Linda Vista and Oak Grove Drive with an overlook to the Devil's Gate Dam spillway. An existing tunnel under Oak Grove Drive will allow pedestrian access to the western end of the dam. The parking area will be landscaped and located on the upper terrace; ADA accessible trail/ramp(s) will take visitors from the parking area to the lower observation area and the tunnel under Oak Grove Drive giving access to the dam area. An existing retaining wall along the observation area will need to have the existing chain link fencing replaced with ornamental iron safety fencing. This ornamental fencing will be similar to that recommended for the dam's parapet walls. A gate will be installed on the southern opening of the tunnel to allow for securing access at night.

East Access (entry) to Dam

In order to eliminate maintenance vehicle/equipment traffic in adjacent residential neighborhoods, a new entry slip lane allowing direct access to the dam and basin from Oak Grove Drive will be constructed. This project will retain the existing limited parking for County maintenance vehicles as well as dam and basin access roads that will allow maintenance vehicles and equipment better access to the flood management/water conservation pool and dam. The existing road bed at the eastern end of the Devil's Gate Dam area will be raised to accommodate the new slip lane, tapering off to meet the existing east side maintenance road/trail, which will be uniformly graded and descend to the flood maintenance staging area. This access will allow maintenance vehicles a one-way access to enter the area via a secured entry gate and to drive (westbound) across the dam or down into the debris/sediment basin. The entry gate will be configured to allow bicycle access to the dam from Oak Grove Drive.

West Access (Exit) from Dam

The (westbound) flow of maintenance vehicle traffic across the dam requires an exit on the west end of the dam. This one-way exit will be provided at the location previously used as a temporary access road during construction projects on the dam. Vehicles exiting the dam at this location will be required to turn right. Maintenance vehicles will be able to drive to the 210 Freeway on-ramps at Berkshire Place without driving through a residential neighborhood.

Close La Canada Verdugo Road

The existing pipe gate at the end of the cul-de-sac on La Canada Verdugo Road will be removed and the curb restored, eliminating vehicle access from this residential street. Vehicular access to the

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dam will be through the proposed Oak Grove Drive Entry and Exit. A landscaped berm will be created along the edge of the cul-de-sac to further buffer the adjacent residential neighborhood from park activities. Storm drains and perimeter fencing will be modified as needed.

Dam Keeper's Quarters and Public Restroom

The existing dam keeper's quarters located on the east side of the dam will be demolished and rebuilt as a public restroom to serve park visitors in the dam area and as they enter/exit the Central Arroyo area. A new dam keeper's quarters will be built above the public restroom with sleeping quarters, a small kitchenette, and a private restroom. This second story will afford the dam keeper a view of the basin during storm events. On the ground level, connected to the public restroom, will be a storage area (single-car garage) for materials and equipment related to the operation and maintenance of the dam. The existing septic system at the former dam keeper's house (the current Arroyo Seco Resource Center) will be replaced with a gravity-feed sewer to a sewage lift station pumping sewage to the main sewer east of the La Cañada Verdugo Road cul-de-sac.

Public Safety at Dam and Observation Deck

The City of Pasadena (City) will work collaboratively with the Los Angeles County Department of Public Works (County) to enhance safety at the deck on the dam, at the observation deck south of the westside tunnel overlooking the spillway, and along the trails (see project, Dam Observation Trail) that lead down to an observation point overlooking the dam and the water conservation pool. Safety could be enhanced through the installation of ornamental fencing along the dam parapet walls and the spillway observation deck. Fencing will be similar to that installed by the City on the Colorado Street Bridge.

WESTSIDE PARK ACCESS

Park Entrance at Foothill Boulevard

The main westside park entrance will remain at Oak Grove Drive and Foothill Boulevard. The entry will receive a new park entrance sign, landscaping, and entry area lighting. This entrance will be for egress, ingress, and unobstructed access to the Metropolitan Water District (MWD) property, including the Rose Bowl Riders and Tom Sawyer Camp tenants. As needed, the use of a traffic control facility/entry kiosk for security and dissemination of information will be assessed.

Oak Grove Drive Improvements

An access lane will make entry to the park safer and more efficient, as well as alleviate the Oak Grove Drive peak-hour traffic at La Canada High School and Jet Propulsion Laboratories (JPL). A one-way access lane from Oak Grove Drive, north of the Berkshire Place intersection is proposed to allow entry during park events and morning/afternoon high school student drop-off/pick-up. The access lane will be ingress only and will have a secure gate built into the perimeter fence with appropriate signage. Due to public safety concerns, a portion of this project has been temporarily implemented.

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EASTSIDE PARK ACCESS

New Park Entrance

The new park entrance will be relocated to the intersection of Windsor Avenue and Mountain View Street. The existing parking lot on Windsor Avenue will be demolished and relocated to the north end of the existing Jet Propulsion Laboratory (JPL) parking lot, once and only when the project to convert JPL Parking to Public Parking is ready to be implemented. The widening of the roadway area at the intersection of Windsor Avenue and Ventura Street with the new park entrance road will require a new retaining wall to the west of the current entrance/intersection. After the new entrance roadway is constructed, the surrounding land will be landscaped with native vegetation including oak woodland species. If the County implements any improvements to the Windsor Avenue and Ventura Street intersection prior to the implementation of this proposed project, the intersection will be evaluated for traffic volume safety and whether any further improvements will be necessary.

WATER CONSERVATION

Increasingly, water in southern California is becoming a valuable commodity. Allowing more water to recharge the Raymond basin for use and not to pass through the dam to the ocean is a major goal of the master plan. In an average rainfall year, Devil's Gate Dam, with a minimum capacity of 1,400 acre-feet below spillway height (current capacity is 1,424 acre-feet), will allow the basin behind the dam to fill with inflowing water one to three times, depending on the condition of the watershed. In a drought period, the watershed could retain all the rainfall and the dam could not even fill up once. The watershed, like a sponge, dries out during drought periods. It must reach a saturation point or have a storm of enough intensity before runoff flows to the basin. In the winter of 1992-93 (El Niño year), the basin could have filled over 40 times. Therefore, a sophisticated operating procedure needs to be developed to balance the goals of water conservation, flood control, and sediment management.

The City is obligated to the 16-member Raymond Basin Water Board to continue operation of 13.1 surface acres of spreading grounds. The Raymond Basin requires that any changes to the spreading area and annual quantity of water spread be equal to or greater than currently exists/occurs. Changing the existing method, area and pattern of recharging ground water could affect the NASA/JPL remediation activities for groundwater contaminants. Projects to improve water resource operations will require further environmental review and close coordination with NASA/JPL prior to any implementation.

Seasonal Flood Management Water Conservation Pool

The flood basin behind the dam has been filling with sediment. With an existing capacity of 1,424 acre-feet, it is approaching the minimum capacity of 1,400 acre-feet. Since 1978, when the dam was declared unsafe to hold water, vegetation has been allowed to grow in the 92 acres that will be flooded now that the dam has been reconstructed. When water conservation measures are implemented, this vegetation will begin to die as it is frequently inundated. To create new quality habitat above the spillway elevation and increase the capacity to a maximum 1,900 acre-feet, to allow for 500-acre feet of inflowing sediment capacity, this project would move 378 acre-feet of material on site and remove 243 acre feet of material off-site. This would reduce the area frequently inundated to 69 acres and create 23 acres of new recreational and habitat area. It would also create a flood control pool to better manage inflowing sediment and floating debris and a water conservation pool to allow the retention of floodwater for pump-back to the spreading basins.

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Pump-Back System

This project involves the installation of the infrastructure needed to pump water at selected times from a seasonal flood management/water conservation pool behind the dam, north, to the existing improved spreading basins on the eastside the proposed spreading basins on the westside of the park. A new inlet structure with pump located near the dam would be created to pump water from the pool and into a new distribution system. The distribution system, including the size of piping and pump, will be designed to take water from the new inlet north along the eastside of the basin, at the bottom of the slope and adjacent to other domestic water distribution lines, to the highest eastside basins, continuing west across the North Bridge Crossing to gravity-feed both the proposed westside basins and existing improved eastside basins.

Overall Storm Drain Modifications

Storm water entering the proposed Flood Management Water Conservation Pool from Flint Wash, from runoff of adjacent lands, and from all storm drain outfalls, will need to comply with statemandated water quality standards including monitoring and cleanup of pollution from runoff. Runoff pollutants include horticultural fertilizers and pesticides, pathogens from animal manure (dogs and horses), and hazardous substances in municipal waste including trash, oil, and grease from motorized vehicles. Remediation may occur at the outfall location in the Park, at a pollutant source or at the inlet to the storm drain, depending on the particular type of pollutant. This becomes important due to the planned pumpback of water held behind the dam for percolation in the spreading basins to recharge the Raymond Basin aquifer, a source of drinking water. A fiscally workable solution to some of these pollution problems remains to be found, both technically and scientifically. Best management practices will be utilized to ensure that TMDL's (Total Maximum Daily Loads) of pollutants are reduced and that a natural/biological alternative is considered first in finding a solution.

Westside Spreading Basins

This project creates three new basins (nos. 13, 14 & 15) totaling eight surface acres on the westside of the park and brings Pasadena's total spreading operation to 21 surface acres. The City has the right to divert a maximum of 25 cfs from the Arroyo Seco stream. The Water and Power Department has concluded that the optimum water surface acres for spreading, with diversion and pumpback, will be 22 to 26 acres. The master plan dedicates a total of 26 surface acres to the spreading operation. The maximum depth of the water in these ponds will be six feet. This project also involves extending the distribution system for the new spreading from two sources: a) the diversion of Arroyo Seco and Millard streams as well as from the new pumpback system infrastructure, along the eastside of the basin. This project is directly related to another project, Construction of the Northerly Perimeter Trail Bridge Crossing, described later. The bridge crossing is needed for the successful completion of the new westside spreading basins as it provides the means for a utility crossing including a water diversion and pumpback infrastructure crossings to the westside basins.

Eastside Spreading Basins

Opportunities for spreading water will be enhanced through the expansion of existing and creation of new basins in the area now occupied by the JPL east parking lot. Testing has shown the rate of percolation of water into the Raymond Basin is greater in this area than in the existing basins. Existing basins nos. 1, 2, 3 and 4 will be expanded to the east. Two new basins will be created to the north of basin no. 1 and the existing east-to-west connecting trail. The City of Pasadena's two sludge basins will be relocated and expanded to the north of the new spreading basins. This expansion will

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occupy approximately 75 percent of the current JPL east parking lot, and will add five surface acres on the eastside.

The City of Pasadena is required by the Raymond Basin Management Board to maintain and operate the existing total of 13.1 surface acres of spreading.

Altadena Drain Improvements

The Altadena drain extends into the stream channel north of the existing spreading basins. The extended concrete box structure was used as part of an earthen breakaway dam, which would divert water to the eastside spreading basins. This site is no longer used as a diversion facility due to the environmental impact from this diversion method. To widen the stream corridor, allowing for a more natural stream alignment, (see Habitat Project #1: Stream Corridor Alignment) the drain will be shortened and the embankment armored to prevent erosion. This stream corridor will be restored to a riparian habitat similar to, and as a continuation of, the same plant community immediately north of the JPL Bridge. Due to urban runoff, this riparian habitat also exists for a short stretch of the stream course south of the drain.

Altacrest Drain Improvements

The discharge from the forty-inch reinforced concrete pipe (RCP), adjacent to the Gabrielino Trail Road and east of the JPL east parking lot (just south of the equestrian trail), will continue downslope in an extended, enlarged single RCP. This underground drain line will run between the enlarged existing ponds and empty directly into the stream corridor. There will be an inlet to receive runoff from the eastside park road and the remaining northerly quarter of the existing parking lot.

FLOOD MANAGEMENT

An important element of the HWP master plan is flood control or management of storm events for public safety. The 1919 Lease Agreement between the County and the City designates an area for flood control that encompasses approximately 80% of the HWP acreage. Under the most extreme conditions this area could be flooded. This includes all the area behind the dam below elevation 1075.

Park elements need to be designed with these flooding considerations: The area that is most frequently inundated is below an elevation of 1040.5 (the floor of the spillway). Park elements between the elevations of 1040.5 and 1075 will need to be reviewed by all parties and designed for the possibility of a short period of inundation (maximum of several days). The capacity below the elevation of 1040.5 should be as great as possible for water conservation, sediment management, and flood management. Currently, the area at this elevation of 1040.5 covers 92 surface acres. Much of this area is covered with only a few feet of water when the water level is at spillway height (1040.5). The conceptual grading plan proposes to excavate material, creating a deeper debris and sediment basin. This excavated material will be placed so that an additional 23 acres will then be above the elevation of 1040.5. This raised area will be infrequently inundated, and could be used for habitat restoration and recreation. The areas that are frequently inundated (at 1040.5 and below) are reduced to 69 acres (from 92 acres) according to the conceptual grading plan. An additional 243 acre-feet will be removed from the site to achieve the maximum capacity of the debris and sediment management basin as shown on the conceptual grading plan. This grading will achieve the following benefits:

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- The floodwater and sediment capacity of the management basin will increase, because much of the material excavated from below the 1040.5 elevation will be placed above the 1040.5 elevation.
- The needed capacities for flood management could be met by not having to move graded
 material off-site for three to five years. By this time, the new willow habitat will be
 established, existing habitat could be removed, and more sediment will have accumulated,
 reducing the capacity.
- There will be an additional 23 acres for habitat establishment and recreation. The Streambed Riparian Habitat, which will be infrequently inundated, will gain five acres.

Most of the existing willow habitat will be inundated if this proposed grading does not occur (see Habitat Project #2**). The habitat will begin to degenerate as more water conservation measures are taken and water is kept at the 1040.5 elevation for pump-back purposes. Water conservation measures can begin as soon as the City and the County resolve a number of liability issues.

Sediment and Debris Management

The minimum capacity for flood management is the volume below the spillway floor, which is 1,400 acre-feet (one debris event). This minimum capacity must be maintained. Therefore, as sediment inflow varies from year to year, and as the total volume of inflowing sediment decreases the capacity, to the minimum 1,400 acre-feet, sediment must be removed. The grading plan illustrates the proposed maximum capacity, which will be 1,900 acre-feet. This will inundate a 69-acre area at an elevation of 1040.5. The difference between this maximum and the minimum capacity (500 acre-feet or 806,667 cubic yards) equals 5.5 years of the historical annual average inflow of 145,200 cubic yards of sediment.

Debris and sediment removal of approximately 3,000 cubic yards will occur each summer to maintain and/or restore the dam's lowest opening, the sluice gate. This could permit the continuing operation of the flow-assisted sediment transport (FAST) program, which has accounted over the years for the removal of approximately 20% of the inflowing sediment.

Because drought years transport small amounts of sediment and large sediment transport events occur unpredictably, sediment should be removed from the park on an as-needed basis. Sediment removal could happen in consecutive years, but in reviewing historical data, it is more likely that this will only need to be done every three to seven years. Procedural policies and specifications for processing and removal of sediment need to be drafted by the City and the County.

The conceptual grading proposes to shape the basin with sides as steep as can be safe and stable (3:1 slope). This maximizes the capacity and allows the space to be easily maintained. At elevations of 1030 and below, newly deposited sediment, debris, and emerging vegetation will be excavated. One of the goals of the master plan is to establish a permitting process that will allow sediment removal to occur on an as-needed basis. This area below 1030, the debris and sediment basin (i.e., water conservation pool) will be shaped not only to facilitate the removal of deposited sediment, but also to influence where sediment is deposited. With an incoming storm event, it is ideal to have water at elevations of 1020 to 1030. This causes sediment-laden water to slow as it enters the water conservation pool, dropping out the sediment below the established habitat and upstream of the dam, thereby not affecting the dam's control features. If water is at 1040.5 (spillway height), then sediment will be deposited in the newly widened stream corridor and will inundate the streambed riparian plant community. As a storm event passes and water continues to enter the basin, it becomes less sediment

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laden. When this occurs, water should be allowed to accumulate to the maximum capacity. This will inundate the established willow and riparian habitat with water and nutrients, and accumulate water for the proposed pumpback (See project, Pumpback System) for water conservation purposes.

Another aspect of this project element is debris removal. For the safe operation of the dam and downstream flood-control structures, debris needs to be prevented from passing through the dam, or obstructing openings in the dam, outlet tunnel, and spillway headworks. An area on the east side of the debris and sediment management basin (i.e., water conservation pool) will be raised to an elevation of 1045, and used as a staging area for equipment to remove floating debris.

Sediment Removal Access

A permanent haul road will be constructed on the west side of the Flood Management Water Conservation Pool. It will connect Oak Grove Drive with the bottom of the basin behind the dam. A secure gate built into the perimeter fence will provide sediment removal trucks and maintenance equipment with access to the sediment and debris management basin. The 210 Freeway on-ramps at Berkshire Place provide access to all destinations eliminating trucks driving through a residential neighborhood.

OAK GROVE AREA

Group Picnic Shade Structures

Group picnic areas will accommodate four to six picnic tables. The shade structures, two south and two north of Oak Grove Field, will be designed to fit the natural character of the park and use indigenous materials as well as conform to the Arroyo Seco Design Guidelines. The floor of the group picnic area will be graded level and smooth and surfaced with a permeable material such as decomposed granite blended with native soil and a binder. Electricity will be provided to the structure, and amenities such as barbecues with counters, sinks with running water, and gray-water drains will be provided. A trash disposal area will also be provided to store multiple cans with lids. The group picnic areas will meet all ADA-accessibility requirements.

Westside Picnic Amenities

Both group picnic areas and smaller/individual picnic areas are planned for the westside park area. The Upper Oak Grove will continue to have a distribution of picnic tables within its use area. The Lower Oak Grove will serve as the location for two designated group picnic areas. The first is in the area south of the Oak Grove Field where two picnic shelters will be provided for group picnics. The other is the east end of the overnight camp area, which will also provide two picnic shelters. A minimum of two picnic areas within the westside park area will be ADA-accessible. There are currently 52 picnic tables within the westside park area. The number of picnic tables has steadily decreased over the past thirty-five years due to age, wear, and misuse. It is estimated that the total number of tables will double to accommodate the use anticipated by the park improvements proposed for the westside park area. Existing picnic tables will be moved to better positions, which will also relieve the compaction on sites where they currently sit. A program to rotate the picnic tables will be implemented, particularly in areas where a table is within the drip line of an oak tree.

Oak Grove Field Restroom

The burned-out restroom at the southwest corner of the existing Oak Grove Field has been removed and will be replaced by a new restroom facility that includes storage. The new restroom facility is

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east of the former location and at the southeast corner of the renovated Oak Grove Field. A sewage lift station will be constructed. The sewage lift station will transport sewage west to the main sewer system on Oak Grove Drive. The new replacement restroom will be similar in size to the existing restrooms in the Oak Grove area. The facility will also have security/safety lighting installed.

Foothill Drain Improvements

Increased runoff from the widening of Oak Grove Drive, Foothill Boulevard west of the park entrance, and a portion of the La Canada-Flintridge area has caused severe erosion on the slope above the existing Oak Grove Field. The existing twenty-four-inch concrete drain will be extended down the slope and then turn parallel to the Oak Grove Field. The drain pipe will be covered over and the slope restored. The new end of the drain will discharge stormwater into an improved existing swale that flows south at the base of the slope.

Outdoor Amphitheater

The existing amphitheater located just west of Oak Grove Field will be restored. For public safety and ease of maintenance the seating will be designed to prevent movement of the existing unsecured poles. The area will be fine-graded and surfaced with the appropriate material to make the area ADA-accessible.

Sycamore Grove Fields

Two new, approximately 2.4-acre multipurpose fields will be constructed. This field size also allows the area to be converted into multiple practice fields for youth soccer. These multipurpose play areas will also accommodate youth tournament soccer, open play, group picnics, and other group and nongroup activities. The southern field will be adjacent to and east of the expanded parking lot. This area is currently used for temporary overflow parking. Under existing conditions, the southern portion of this field is prone to flooding; therefore, the area will be built up from its current elevation of 1040 to an elevation of 1050. Fill material for construction of the southern Sycamore Grove Field and disc golf course improvements will be provided by excavated material from the conservation pool. The northern field will be adjacent to and east of the Supervised Overnight Camping Area. Under existing conditions, this area is well below the flood inundation elevation of 1040.5. Due to past mining operations, a large depression exists with the bottom at elevation at 1025. Material excavated to widen the stream channel will be used to raise this area to above elevation 1055. During disaster emergencies, these areas will be used as a staging area for fire crews and other emergency support groups. Best management practices for turf maintenance will be utilized to avoid possible impacts to ground water quality. A natural/biological alternative will be considered first for turf maintenance.

Upgrade Oak Grove Maintenance Office Sewer [Not on Map]

The Oak Grove Maintenance Office (OGMO) is currently on a septic system. The restroom facilities do not need upgrading. The current septic system will be converted to a gravity-flow system that will flow to the proposed sewage lift station near the Berkshire drain, and then be pumped up to the existing sewer main in Oak Grove Drive.

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Disc Golf Course Improvements

The disc golf improvements include relocation of the back nine pins in the north Oak Grove area, and pins 6 through 9 of the front nine to the south and east of the existing parking lot. The relocation of the disc golf area provides the opportunity for habitat restoration of the north Oak Grove area. The relocated disc golf course will be developed by excavating material from the water conservation pool area (ruderal habitat areas) and placing the material in the area between the existing willow stands to an average elevation of 1046 which is above the frequently inundated elevation of 1040.5. Drainage of courses in this area will occur within the existing stands of native willow habitat. Amenities, including a bench at every tee, will be constructed in accordance with the Arroyo Seco Design Guidelines.

Expanded Parking Area

This existing parking area, immediately east of the Oak Grove Field, will be expanded to accommodate the abandoned overflow parking area. The existing parking area will be accessed via the improved access road. This parking area is intended to replace the dirt overflow lot that is being converted to Sycamore Grove Field. This project could be done in conjunction with another element, i.e., the removal of existing asphalt paving in the basin (from past mining operations). The removed asphalt could be used as base fill for the new expanded parking area. As a part of this project, the existing access road with a small adjacent parking area will be extended and improved to allow for a turnaround for park users, buses, and emergency vehicles. The Arroyo Seco Design Guidelines will provide further guidance for this project.

Native Plant Nursery

A plant nursery will be established at the existing Oak Grove Maintenance Office (OGMO). It will provide materials and equipment necessary to produce native stock for revegetation of Hahamongna Watershed Park and other areas of the Arroyo Seco. Such materials and equipment will include propagation tables, interpretive signage, storage bins for soil and amendments, and a holding area for larger container stock. An adjacent unused ruderal (weedy) area will be incorporated into the OGMO yard for this purpose, with new fencing to delineate the enhanced area.

SUPERVISED OVERNIGHT CAMPING AREA

Supervised overnight camping is proposed in the northern portion of the Oak Grove area. The overnight camping area will be available for individuals and groups during the day but will only be available to organized groups with proper supervision, such as Boy Scouts, Girl Scouts, or church groups for camping during nighttime. The facilities for group overnight camping to be provided include shade structures as described under Project 6.1, Group Picnic Shade Structures, food preparation counters with sink, barbecues, drinking fountains and a renovated restroom. Selected campsites and access will be provided for the disabled. Two gathering areas will be created. A fire ring will provide seating for small groups. Seating will be provided by wooden poles or elevated planks for easy maintenance. An outdoor amphitheater will also be sited within the area. It will be a much smaller version of the amphitheater west of the Oak Grove Field but built in the same style and of the same materials.

The overnight camping area will be administered by park staff, scheduled around the clock when the area is reserved. The existing Los Angeles County Trail maintenance and storage area will be converted to provide accommodations and administrative space for park staff. Parking for staff and

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overnight campers will be provided in this area. A trash-bin enclosure will be provided adjacent to the staff building. A sewage lift station will be located between the existing restroom and the converted County building (with an added bathroom and kitchenette) with gravity sewer lines from each and a force main to the gravity sewer main at Oak Grove Drive.

Selected areas of the overnight camping area will be restored to oak woodland. These areas will be identified as restoration areas and protected from human interference. With the exception of the existing trail(s) at the northernmost edge of the overnight camping area, horse trails through the oak woodland will not be allowed. Hitching posts in the central area of the overnight camping area will not be allowed. Hitching posts and a watering trough will be provided at the southeast corner of the overnight camping area near the turnaround and away from tree trunks.

Park Ranger Station Improvements

The existing building used by Los Angeles County Trail maintenance will be converted to a park ranger station to oversee the overnight group camping area. A sewage lift station will be located between the existing overnight area restroom and this converted park building (with an added bathroom and kitchenette) with gravity sewer lines from each, and a sewage lift station with force main to the gravity sewer main at Oak Grove Drive.

Restroom Improvements

The two existing restrooms in the Oak Grove area, on the upper terrace and in the overnight camping areas, will be upgraded with new fixtures, partitions, and other amenities to meet current ADA accessibility standards. This is already approved and underway as a CIP project.

Improve Existing Parking Areas

The existing dirt parking area adjacent to the ranger station will be developed as a new, decomposed granite, parking area to serve the overnight camping area. The parking area will provide overnight parking for campers west of the park road on the same side as the ranger station. A new masonry enclosure will be constructed to secure trash dumpsters at the rear of the parking area. The dirt parking area (east of park road) will be improved to accommodate a drop-off area for campers with space for buses to pull through.

EQUESTRIAN STAGING AREA

Improvements to the equestrian staging area include the following: improved vehicular access and parking for school bus and horse trailer turnaround, restroom rehabilitation, improved observation area (Sunrise Overlook), trail connections, and picnic amenities for informal gatherings.

Upgrade Existing Restroom

This existing restroom will be renovated to provide access for maintenance, upgrade the accommodations, meet ADA-accessibility standards and improve the physical appearance. The septic system will be replaced with a gravity sewer to a sewage lift station with force main. This could be combined with the sewer improvements needed at the existing OGMO with gravity sewers from both, to a central location next to the Berkshire drain, where a sewage lift station will be located to pump sewage up to the main gravity sewer line in Oak Grove Drive.

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Realign and Widen Access Road

The existing access road will be widened to safely accommodate two-way traffic from the upper Oak Grove turnaround and raised to pass over an improved drain line. (See project, Berkshire Drain Improvements.) South of the Berkshire Drain, a new one-way road would allow in coming traffic to enter the existing parking area on the northern edge. All vehicular traffic will exit via the southeast corner of the parking area, loop back along the old entry road and return to two-way traffic south of the new drain crossing. The softer, wider turns and one-way traffic flow will provide easy access for horse trailers and buses. Pavement will be eliminated where possible from the existing roadway between the Berkshire Drain and the Flint Wash Bridge.

Berkshire Drain Improvements

The increased volume of runoff from the widening of Oak Grove Drive and Berkshire Place has caused severe scouring of the downstream drainage swale within the park. The park road will be raised and a new transition structure built with a new enlarged, reinforced concrete pipe running under the road and down the slope, exiting into the basin on the east edge of the Westside Perimeter Trail. The trail will cross over the Berkshire Drain at this juncture. The erosion on the slope will be filled and the area restored with Coast Live Oak woodland habitat. The area where the drain line crosses under the Perimeter Trail and from the outfall to the Water Conservation Pool will have restored Southern Willow Scrub riparian habitat stabilized to prevent future erosion. The widening of the park road during this project will allow two lanes of traffic to pass safely from and to the Equestrian Staging Area.

SUNRISE OVERLOOK

This project is located on the knoll off Oak Grove Drive, between Flint Wash and the Equestrian Staging Area (See project Sunrise Overlook). The area will be cleared of all existing vegetation (including many non-native trees, weeds, and some existing native vegetation comprised of seeded sage scrub from the 1970's when the first Foothill Freeway (I-210) off-ramp was removed from this location) and a natural appearing hollow will be created that will accommodate a small group gathering area. The site provides a promontory overlook of the basin and the San Gabriel Mountain range in the backdrop. The site will allow groups to gather below the rim of the knoll that will create a sight and sound barrier from Oak Grove Drive and the nearby Foothill Freeway. The carved-out hollow will create an intimate gathering area that will be enhanced with planted Coast Live Oak woodland that will provide shade for the users of the site. Large boulders existing onsite will be used to form the edges of the hollow and contribute to the area's character. Boulders and historic carved, granite curbing (from Old Pasadena) will be used to create seating terraces. The stage or front of Sunrise Overlook will sit at the top of the existing retaining wall; access to the top of this area will be provided by the existing trail from the Equestrian Staging area. The site will be ADA-accessible from new trail ramps that will be provided both from the north and the south along the top of the existing retaining wall.

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SUNSET OVERLOOK

This project element is on the eastside of the park, immediately north of the Windsor/Ventura intersection. This area is at a great west-facing promontory outlook, providing an overview of the basin from this side of the park. The project element is largely a clean-up and restoration project. The area will be cleared of all weeds, brush, and dead trees. The area will be planted as specified in the habitat restoration plan. Seating and interpretive signage will be provided at this site for visitors to learn about the area and to understand what they are viewing from this location. The overlook is located at the main eastside park entrance. The project element will predominantly serve as an inspirational and educational opportunity. The site will overlook water conservation elements of the park, habitat restoration areas, and stream corridor restoration in the park. The site will provide a small area for parking.

GABRIELINO TRAIL AREA

Convert JPL Parking to Public Parking

This project proposes a new trailhead at the north end of the existing eastside JPL parking lot to bring park users into this area of the park, up the Gabrielino Trail and into the upper Arroyo Seco watershed area. This location will provide a new restroom, picnic tables, public parking, and interpretive signage for area recreational users. When the northern quarter of the existing JPL parking lot becomes available for public parking, the existing parking at Windsor Avenue and Mountain View Street can be used for a new park entrance.

New Public Restroom

A new restroom will be constructed at the north end of this remodeled parking lot to serve visitors to the park as well as those headed into the Angeles National Forest. The size of this restroom will be determined to meet the needs of those who visit this area. A public telephone will be located at the structure. This restroom may need a sewage lift station with a force main to the JPL gravity lines across the JPL bridge.

TRAIL DEVELOPMENT

Perimeter Trail

Development of the Perimeter Trail will provide a complete loop of HWP for equestrians and hikers. This trail incorporates improved existing trails and will be completed through the addition of reconstructed trail on the west side below the Equestrian Staging and OGMO areas, and new trail in association with the new Sycamore Field and the Disc Golf Course on the west side. The Perimeter Trail will also be available for security, emergency responses, and maintenance vehicles.

The trail will have a minimum elevation of not less than 1045 (4.5 feet above the 1040.5 spillway elevation), so that it can be accessed during most storm events. Storm drains will be installed under the perimeter trail at critical cross-drainage points to eliminate trail washouts and to avoid disturbing the existing drainage patterns entering the basin.

The perimeter trail will serve as a habitat protection delineator; above and outside the perimeter trail, various improvements will be for human benefit. Below and inside the perimeter trail, habitat quality will be improved to contain plant and animal species diversity allowed to thrive by minimizing human interference.

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The construction of the proposed perimeter trail requires a number of project elements to connect various junctures and crossings as well as segments of reconstructed and new trail. The trail begins at the west end of the dam and follows the proposed alignment in a clockwise pattern.

Flint Wash Bridge Crossing

The bridge will provide the perimeter trail system a critical, unifying link between the east and west sides of the park. The west end of the dam will be connected to the westside park via a bridge crossing over Flint Wash. This crossing will use a prefabricated metal bridge with 12-feet-wide wood decking to span approximately 150 feet across the wash. The crossing will utilize an existing abutment from a previous historical bridge in this same location. This crossing will be used by all visitors, including bicyclists, equestrians, and hikers. Bicyclists will come onto the dam via the proposed access off of Oak Grove Drive, cross the dam, cross Flint Wash Bridge and then ride into the Oak Grove area of the park via the paved park road. Equestrians and hikers will come onto the dam via the eastside perimeter trail, the east rim trail, or from the south via the Arroyo Seco Trail (part of the Santa Monica Mountains Conservancy's Rim of the Valley trail network), cross the dam, cross Flint Wash Bridge, and then travel west up Flint Wash Trail (part of the Rim of the Valley Trail network) or north on the westside perimeter trail. The dam and Flint Wash Bridge will be "shared" crossings for these various user groups along with emergency and maintenance vehicles.

The portion of the trail on the westside, in the vicinity of Berkshire drain between and below the Equestrian Staging and OGMO areas, will be reconstructed and raised to a 1045 elevation to ensure it is out of the frequent flood zone.

The portion of the trail at the south and east edge of the relocated disc golf area will need to be raised to a 1045 elevation to ensure it is out of the flood zone.

The portion of the perimeter trail east of the relocated disc golf area and the new "Sycamore Grove Field" will go north to the edge of the second new field, around the field on the south western edge and north on the existing trail, along the western edge of the field and the new westside spreading basins to the existing westside JPL parking lot.

From the southern end of the existing JPL westside parking all the way north to the North Bridge Crossing, a paved bicycle trail will parallel the Perimeter Trail.

North Bridge Crossing

The northerly Perimeter Trail bridge crossing will be made of a style and material similar to the Flint Wash Bridge crossing and will serve as the northerly connection between the westside and eastside parks. Hikers, equestrians, bicyclists, and maintenance/emergency vehicles will share the crossing. The bridge will span 150 feet and be 12 feet wide. The bridge will also serve as a utility crossing for water and power lines needed for eastside uses in which maintenance and emergency vehicles will share the crossing. Appropriate signage will be posted. This bridge will provide the missing link in the park perimeter trail system of all-weather, all-year access from the westside of the park to the eastside for park users, emergency and maintenance vehicles. After crossing the bridge, the bicycle route will separate from the Perimeter Trail with a paved bicycle trail connecting to the eastside paved roads.

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The improved eastside segment of the perimeter trail is on the western edge of spreading basins 3 through 12 (new spreading basin numbers), and Johnson Field. This alignment will be shared as a flood maintenance access road as it extends south to the dam.

East Rim Trail

Development of the East Rim Trail for pedestrians and equestrians consists of constructing new trail from the VOC Water Treatment Plant to the Arroyo Well and reconstructing abandoned trail from the Arroyo Well to the Altacrest Trail. It will be graded to accommodate pedestrians and equestrians. Construction of the East Rim Trail will require cut and fill to be balanced onsite. This project will extend the existing trail that roughly follows the upper rim of the eastside slope. The new trail will be constructed parallel to the road leading from the Arroyo Well to the VOC. It will cross the entry access road close to the proposed Interpretive Area and skirt the eastside of the existing parking lot, joining up to the existing Altacrest Trail. To further clarify, this will be a new trail going from the VOC to the Arroyo Well and a reconstructed old trail from the Arroyo Well to the northern east/west connecting trail.

Trail Connections from East Rim Trail to Basin Perimeter Trail

This project will create four trail connections along the eastside linking the upper rim trail to the lower perimeter trail. Each of the trail connections will accommodate pedestrians and equestrians. It is anticipated that cut and fill can be balanced within the segments. These connections will allow pedestrians and equestrians to access eastside park features from the upper East Rim Trail and park users to avoid or bypass sediment/debris removal maintenance operations as necessary.

West Rim Trail and Connectors

The West Rim Trail starts at the west end of the Flint Wash Bridge, past the Equestrian Staging Area, heads north through the upper Oak Grove area on the westerly edge of the park, and then continues north through the MWD property where it converges with the basin perimeter trail. A portion of the West Rim Trail runs parallel with but is separated from the bike route; this occurs in the stretch from the Equestrian Staging Area to the Flint Wash Bridge. Pedestrians and equestrians traveling south from the Foothill Boulevard equestrian tunnel currently cross-the main entry access road entering HWP from Foothill Boulevard. This component will reroute to a new constructed trail at a lower elevation to avoid conflicts with vehicle traffic at the Foothill Entrance. The new trail will connect to the existing trail just south of the big bend at the park entrance road.

Trail Connections from West Rim Trail to Basin Perimeter Trail

This component replaces the existing stairs connecting the upper level to the lower level, which is eroded and unsafe. This project element will grade a new trail linking the upper terrace restroom to the south end of the Oak Grove Field and back up to the West Rim Trail via the reconstructed old trail to the Foothill Boulevard park entrance.

Dam Observation Trail

The Dam Observation Trail establishes a trail loop from the eastern end of the reconstructed Flint Wash Bridge along the top of an existing retaining wall down to an elevation of 1045, west to an observation point, and back up to the western end of the Devil's Gate Dam. This loop trail will only be accessed by pedestrians. This will require cut and fill to be balanced onsite. From the top of the

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old bridge abutment, park users have a clear view of the interior face of the dam and the water conservation pool area.

BICYCLE ROUTE

Bicycles will be allowed to travel on any existing or proposed paved surface within the park. Bicycles will not be allowed on any designated trail or unpaved surface within the park. The bicycle routes are planned to allow bicyclists to utilize the perimeter of the park and to access bikeways outside of the basin, including the routes within the Angeles National Forest. The planned route also allows riders to access the nearby existing Class III Kenneth Newell Bikeway, the Central Arroyo Seco and the southern reaches of the Arroyo Seco in Pasadena and beyond. Access by bicycles across Devil's Gate Dam and Flint Wash Bridge by will be allowed. The paved bicycle route will parallel the segment of the perimeter trail on the westside of the park from the westside JPL parking lot, north to the North Bridge Crossing. This bridge will be shared by bicyclists, equestrians and hikers. A separate paved bike route will continue east, connecting to the eastside paved roads. At this point, riders will be able to continue on the Gabrielino Trail.

HABITAT RESTORATION

Habitat establishment and restoration is proposed throughout the Hahamongna Watershed Park area, as illustrated in the comparison of the Existing and the Proposed Plant Communities Maps. Habitat establishment will be the creation of improved habitat quality in an area where a particular plant community is not present (in existing ruderal areas) or involves adding area to an existing plant community. Habitat restoration is the improvement of the habitat quality that includes increasing the plant and animal species diversity in an area where a plant community already exists. In general, all plant communities that are not impacted by proposed projects with grading, removal of exotic species, or destroyed by inundation, will be restored. Habitat quality of a site can be defined in terms of a range of its assessed attributes, functions and values as excellent, good, fair, or poor habitat. The ranking of habitat is subjective and varies widely depending on physical condition, degree of biodiversity, and the species addressed. The master plan includes a map illustrating the habitats and their associated plant communities (See Exhibit 3-7A).

The information within this section is presented in two parts. Part 1 is a listing of major habitat projects proposed by the plan. These projects are proposed for specific locations within the park. Some of these habitat projects involve the restoration of more than one plant community within the same project area and have been organized to complement the Park Project Areas phasing (See Section 4). Their listing is intended merely to help convey the location, intent, and magnitude of the proposed habitat establishment and restoration projects. Part II encompasses the goal of habitat establishment and restoration throughout the park and describes projects by Plant Community, linking the various projects previously described in this report to their proposed habitat establishment and/or restoration goals including an indication of the acreage affected. The projects in Part I are broken apart and listed in their appropriate plant community listing in Part II.

Subsequent to the approval of the Hahamongna Watershed Park (HWP) Master Plan the U.S. Fish and Wildlife Service, on February 7, 2001, designated critical habitat for the federally listed Southwestern Arroyo Toad. Those restoration projects and/or areas that are wholly or partially located within this designated critical habitat for the Southwestern Arroyo Toad are identified below with **. On October 30, 2002, the U.S. District Court for the District of Columbia nullified all designated critical habitats for the Arroyo Toad. The USFWS will complete a new analysis of economic impacts and consider updated field survey information to refine where the Arroyo Toad exists. The Interior Department will decide by 2005 which areas of critical habitat to redesignate.

Part I: Proposed Habitat Establishment and Restoration Projects

1. Realign Stream Corridor Restore and Establish Habitat **

This restoration project includes the area from just south of the Altadena Drain, north to the JPL bridge where the stream has been channelized. The Altadena drain extends into the Arroyo Seco stream corridor where at one time it was utilized as part of an earthen breakaway dam to contain water that was then diverted to the eastside spreading basins. This site is no longer used as a diversion facility due to the environmental impact from this diversion method. This project proposes to shorten the Altadena drain and widen the stream corridor to allow for a more natural stream alignment. For a short stretch, the stream course south of the Altadena Drain contains riparian habitat due to urban runoff. This stream corridor will be restored to a riparian habitat similar to and as a continuation of the same plant community immediately north of the JPL Bridge and south of the Altadena Drain.

2. Restore Riversidian Alluvial Fan Sage Scrub**

This restoration project involves a number of smaller projects within a larger area. The larger area includes two plant communities: riversidian alluvial fan sage scrub and sage scrub, as shown on the plant community maps. The areas on either side of the stream corridor to the eastside spreading basins and to the westside JPL perimeter fencing and new westside spreading basins will be restored to these plant communities.

The current equestrian trail on the westside of the existing spreading basins traverses some of the best old alluvial fan sage scrub in the area designated as sage scrub on the plant community maps. The proposal is to abandon the equestrian trail, relocate the trail on the spreading basins maintenance road (asphalt to be removed) and restore the existing trail with sage scrub.

Habitat restoration will also occur at the various drain outfalls along the JPL border where exotic species need to be removed; debris and trash collected and disposed; and the riversidian alluvial fan sage scrub, sage scrub and southern willow scrub habitat restored.

The old stream crossing roadway from both the east and west was paved with asphalt by past mining operators. Most of this asphalt has been removed. The remaining asphalt needs to be removed and disposed, the stream allowed to take its course, and riversidian alluvial fan sage scrub and sage scrub habitat restored.

Additionally, this project establishes riversidian alluvial fan sage scrub at the southern end of this area where it transitions to a streambed riparian plant community. With the Stream Channel Widening Project (See Project #4), both the streambed riparian and the alluvial fan sage scrub plant community areas are enlarged.

3. Establish Habitat at Spreading Basins**

The park master plan calls for the expansion and relocation of the existing spreading basins. There are three sites for this restoration project. Project 3a comprises nine surface acres of new spreading basins, to be numbered 13, 14, and 15, on the westside and will involve the removal of ruderal weedy species. The embankment of the new ponds will be planted with sage scrub species. Over-story tree species need to be considered because of the water they naturally draw for their establishment and growth, which could be contrary to the water conservation goal. If acceptable, sycamore woodland around the perimeter of the spreading basins is recommended. Project 3b involves two new basins north of basin 1 and the expansion of spreading basins 1 through 4 on the eastside. Project 3c involves

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spreading basins 5 through 10 on the eastside. Both 3b and 3c would have habitat establishment as described in 3a, above.

4. Widen Stream Channel and Establish Riparian Habitat **

In this project, the stream channel will be widened on its western edge to at least double its current width. This project is located in the existing narrow riparian corridor between the existing riversidian alluvial fan sage scrub area and the area that will be graded for the water conservation and sediment management pool. As winter rains saturate the upper watershed, storm water begins to flow through this habitat over a larger area, increasing the groundwater recharge for the general benefit of the Raymond Basin as well as providing surface water, encouraging a riparian habitat of higher quality. The existing channel with established vegetation and drainage course configuration to the east will be preserved and the stream channel will be widened to the west. Embankments of the stream could be stabilized to help control erosion where further study indicates that it is necessary.

5. Establish East Entrance Habitat **

This project involves the reconfiguration of the existing Windsor/Ventura intersection as well as the enhancement of Sunset Overlook, situated north of this intersection. Landscaping adjacent to the new park entrance will total 0.3 acre and the Sunset Overlook will total 0.5 acre. It will consist of native plants from the sage scrub and coast live oak woodland plant communities to enhance the appearance of the area and to benefit certain wildlife species. The importance of this area as a park entrance and the absence of landscaping provide the opportunity for both a park project and a habitat establishment project.

6. Restore Habitat along Westside Perimeter Trail

This project proposes to raise the perimeter trail to an elevation of 1045 and create a graded slope of habitat from the westside perimeter trail down to the conservation pool rim elevation of 1030 for the reestablishment of southern willow scrub that will be infrequently inundated up to elevation 1040.5. Material for the proposed fill will be excavated from the ruderal areas within the proposed conservation pool below elevation 1030. The existing vegetation in the area will be hand-cleared to leave willow trees that are taller than the depth of fill. After the fill is placed, these existing willows will root at the higher elevation with the help of water conservation management practices that will provide a higher local water table. This and additional habitat restoration will create a larger area of southern willow scrub of higher quality than exists in this highly disturbed and eroded area.

7. Establish Habitat at Sycamore Fields and Relocated Disc Golf (northern Sycamore Field **)

This portion of the project proposes to raise the elevation of the southern area (southeast of the existing parking lot) that has small pockets of willows with large expanses of ruderal habitat between them. The small areas of existing willows will be linked and receive less fill to create drainage courses with raised terraces of mule fat (disc golf fairways) between. The drainage courses will be extensions of existing drainage from elevation 1050 down to elevation 1030, the edge of the water conservation pool.

The perimeter trail at elevation 1045 will be on the eastern edge of this area. The relocated disc golf and the new southern Sycamore Grove field within this area slopes from elevation 1052 down to the perimeter trail and then down to the conservation pool rim elevation of 1030. Material for the proposed fill will be excavated from the ruderal areas within the proposed conservation pool, below elevation 1030. The existing vegetation in the area to be raised will be hand-cleared leaving willow trees that are taller than the depth of fill. After the fill is placed, these willows will root at the higher elevation with the help of water conservation management practices, which will provide a higher local water table. This and additional habitat restoration will create a riparian habitat area (above the

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frequent inundation elevation) of higher quality. Southern Sycamore Riparian Woodland habitat will be established around this southern field.

This portion of the project proposes to raise the elevation of the northern area, east of the Supervised Overnight Camping Area, which was excavated by past mining operations that left a large depression. Fill material from the Stream Channel Widening project will be placed to raise this area to elevation 1055, above the frequent inundation elevation of 1040.5. After the fill is placed and the northern Sycamore Field is constructed, Southern Sycamore Riparian woodland habitat will be established around this northern field.

8. Establish Oak Woodland at Sunrise Overlook

This project is located at the southwestern corner of the park, along Oak Grove Drive and immediately northwest of Flint Wash. Coast live oak woodland borders the site to the north and is proposed to be expanded south into the overlook area. Sage scrub revegetation is also recommended.

9. Restore Oak Woodland on Westside (partially **)

This project will increase the biological diversity of the Oak Grove area on the westside of the park by using native species prescribed for coast live oak woodland restoration. It will establish young oaks in the existing ruderal open areas to enhance the survival of this mature oak woodland community. Protection of oak and other restoration plantings at the camping area and the group activity areas in the park will be necessary.

10. Establish Sycamore Woodland on Eastside (partially **)

Several sites fall within this project. One area that will encompass the creation of sycamore woodland is at elevation 1030 to 1040 and immediately south of Johnson field. This mule fat habitat will be periodically inundated every winter season. To improve habitat quality it is recommended to raise the grade in the area to elevation 1045 and create sycamore riparian woodland. The establishment of native tree species such as sycamores and cottonwoods is desirable for this area; to the east and north of this area are western sycamore, black cottonwoods, and Mexican elderberry, all of which have naturalized. Sycamore Woodland is also suggested around the perimeter of the east and west spreading basins as well as around the edges of the multipurpose play areas (See proposed plant community map).

11. Establish Riparian Habitat at Perimeter of the Flood Management/Water Conservation Pool

The existing riparian southern willow scrub habitat below the 1040.5 elevation will degenerate and begin to die as soon as water conservation practices are implemented; these areas are periodically inundated during the winter season. The habitat below the 1030 elevation will be completely submerged for varying lengths of time. The 1030 to 1045 elevation zone around the water conservation pool and below the Perimeter Trail will be established habitat of good to excellent quality, that could be subject to several inundations a year. Emerging vegetation, debris, and sediment will need to be periodically removed from the newly established Flood Management Water Conservation Pool per the sediment management guidelines that will be established by the County. This project proposes a phased operation that will permit the area elevated above the floodplain (elevation 1040.5) and the perimeter of the water conservation pool (elevation 1030 to 1040.5) to become established with southern willow scrub plant community. Once these riparian areas are established, the existing southern willow scrub and ruderal plant community areas, that are below elevation 1030, will be removed in a coordinated sediment and debris removal operation. In addition to pumping storm water retained in the Water Conservation Pool back to the spreading basins for

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metered groundwater recharge, this storm water will provide a higher local water table, encouraging a riparian habitat of higher quality, and will provide groundwater recharge for the general benefit of the Raymond Basin.

Part II: Habitat Establishment and Restoration Projects listed by Plant Community

The following table summarizes the acreages of natural plant communities and landscaped/developed areas within Hahamongna Watershed Park, both existing and proposed.

Area		Existing	Proposed
Description	n	Acres	Acres
OW	Coast Live Oak Woodland	37.8	42.6
W	Southern Willow Scrub	25.5	20.5
SS	Sage Scrub	39.9	42.9
RAFSS	Riversidian Alluvial Fan Sage Scrub	17.2	18.8
MF	Mule Fat Scrub	19.5	11.0
SSRW	Southern Sycamore Riparian Woodland	2.6	24.8
R	Ruderal	75.4	2.4
SBR	Streambed Riparian	8.1	8.3
WA	Water Conservation Pool	0.0	54.4
L	Landscaped	5.8	9.8
D	Developed	76.4	74.8
D&L	Developed and Landscaped areas not shown within a plant	10.6	8.5
	community polygon (such as a trail, dirt road, picnic &		
	camping site, disc golf fairways and pole climbing area)		
TOTAL STUDY ACREAGE ¹			
		318.8	318.8

Within the Hahamongna Watershed Park (HWP) there are Landscaped and Developed areas, which have been designated on the plant community maps. The Landscaped areas within the HWP include predominantly nonnative landscaping for playing fields and native landscaping for ornamental purposes. The developed areas within HWP include predominantly roads, parking, and buildings, with native landscaping for ornamental purposes.

Coast Live Oak Woodland

There are currently 37.8 acres of coast live oak woodland within the Hahamongna Watershed Park Master Plan (HWPMP) study area. The 26.2 acres within the park will receive habitat restoration. The following list of projects is proposed for habitat establishment and restoration of coast live oak woodland:

Project	Existing Acres	Acres Added or Subtracted	Proposed Acres
West Side Park Area	20.2	3.8	24.8
MWD property	11.6		
East Side Park Area	6.0	1.0	7.0
TOTAL	37.8	4.8	42.6

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¹ Does not include the areas of Flint Wash and south of the 210 freeway (included in CAMP). Both are within the Park property boundary but outside the study area. These areas total 10.7 acres. Does include the MWD property, 28 acres added + 2.4 acres already included = 30.4

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West Side Park Area: The following three project areas total 3.8 acres of habitat establishment:

Oak Woodland Restoration (Habitat Project #9): This project area, which includes the upper Oak Grove Picnic area and Equestrian staging area, has been undergoing habitat restoration for eight years. This area and the slopes down to the Lower Oak Grove area, including the Oak Grove Field and the west half of the overnight area, are proposed to have an increase of 1.9 acres of oak woodland.

Oak Woodland Restoration (Habitat Project #9**): The east half of the overnight area is within the critical habitat of the Arroyo Toad. This area is proposed to have an increase of 1.0 acre of oak woodland.

Sunrise Overlook (Habitat Project #8): The Sunrise Overlook area, adjacent to the south perimeter of the Equestrian Staging Area, is proposed to have an increase of 0.9 acre of oak woodland.

Eastside Park Area: The following three project areas total 1.0 acre of oak woodland habitat establishment:

Eastside Spreading Basins (Habitat Project #3b**): Adjacent to and west of the new eastside spreading basin No. 2, it is proposed to increase the existing 0.1 acre of oak woodland by 0.2 acre for a total of 0.3 acre.

Adjacent to spreading basin 7 and west of the Arroyo Well, it is proposed to have the existing 0.4-acre oak woodland increased by 0.3 acre for a total of 0.7 acre.

East of spreading basin 14 and the overflow basin**: This area is proposed to have the existing 1.1 acres of oak woodland increased by 0.5 acre for a total of 1.6 acres. This enhances the habitat adjacent to the East Rim Trail. It will convert 0.5 acre of sage scrub to oak woodland.

Southern Willow Scrub

There are currently 25.5 acres of southern willow scrub in the park, of which only 7.7 acres will receive habitat restoration. When water conservation measures are implemented, the remaining 17.8 acres of existing habitat will begin to die as the area is frequently inundated. An additional 13.3 acres of habitat will be established along with the 7.7 acres of habitat to be restored. The following list of the projects is proposed for habitat establishment and restoration of southern willow scrub:

	Existing	Acres Added	Proposed
Project	Acres	or Subtracted	Acres
Stream Corridor Alignment (Project 1**)	0.8		0.8
Westside Spreading Basins (Project 3a**)	0.0	1.2	1.2
Stream Channel Widening (Project 4**)	0.6	3.1	3.7
Westside Perimeter Trail (Project 6)	0.6	1.3	1.9
Relocate Disc Golf (Project 7)	4.5	0.7	5.2
Water Conservation Pool (Project 11)	1.2	4.5	5.7
Storm Drain Improvements ~ JPL**	0.0	2.0	2.0
TOTAL	7.7	12.8	20.5
Habitat lost due to inundation (water conservation)	17.8		
TOTAL	25.5		

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Stream Corridor Alignment (Habitat Project #1**): This project will keep the size of the habitat area unchanged, but will restore habitat found at the southern end of the project area.

Westside Spreading Basins (Habitat Project #3a**): There is currently no southern willow scrub habitat adjacent to the proposed Westside Spreading Basins. This habitat project proposes to establish 1.2 new acres of this plant community east of the spreading basins. The creation of the westside spreading basins will utilize "Landform Grading" principles to improve habitat for this and other plant communities.

Stream Channel Widening (Habitat Project #4**): The stream channel is proposed to have the existing 0.6 acre of southern willow scrub increased by 3.1 acres for a total of 3.7 acres. This restoration project will widen the stream on its western edge for a new, total stream channel width of at least double its current width. Both the east and west sides of the stream channel will be restored with this plant community. Southern willow scrub will be used on the embankments of the stream to naturalize this habitat for native fauna and to help stabilize and control erosion of the stream banks.

Westside Perimeter Trail (Habitat Project #6): The westside perimeter trail is proposed to have the existing 0.6 acre of southern willow scrub increased by 1.3 acres to a total of 1.9 acres. The restoration project proposes to raise the grade on this trail with fill excavated from ruderal areas below the 1030 elevation within the proposed conservation pool. Willows taller than the depth of fill will remain to root at the higher elevation with the help of water conservation management practices, which will provide a higher local water table. This and additional habitat restoration will create a larger area of southern willow scrub of higher quality than currently exists in this highly disturbed and eroded area.

Relocate Disc Golf (Habitat Project #7): The Disc Golf Relocation component is proposed to have the existing 4.5 acres of southern willow scrub increased by 0.7 acre to a total of 5.2 acres. This component proposes to raise the elevation of the area that has small pockets of existing willow scrub habitat. The areas of existing willows will be linked to create drainage courses that will receive less fill than the terraced areas of this project. The drainage courses will be extensions of the existing drainage patterns from elevation 1050 down to elevation 1030, the edge of the water conservation pool. The existing vegetation in the area will be hand-cleared to leave willow trees taller than the depth of fill. After the fill is placed, these willows will root at the higher elevation with the help of water conservation management practices, which will provide a higher local water table. This and additional habitat restoration will create a larger area of southern willow scrub of higher quality than exists in this highly disturbed area. However, with the close human proximity on the disc golf fairways, this area will not be habitat of a quality suitable for a diverse wildlife. It has been recommended that, during the specific project design phase, wider bands of willow scrub plant community be created within the relocated disc golf course and/or between the Perimeter Trail and the Water Conservation Pool.

Water Conservation Pool (Habitat Project #11): This project proposes a phased operation that will permit the areas elevated above the floodplain (elevation 1040) and the perimeter of the water conservation pool (elevation 1040 to 1030) to become established with southern willow scrub habitat. The Water Conservation Pool project will add 4.5 acres of southern willow scrub in this zone for a new total of 5.7 acres of southern willow scrub. These 5.7 acres, inside the Perimeter Trail, form a band around the perimeter of the pool that will provide a higher local water table, encouraging a riparian habitat of higher quality. The existing southern willow scrub habitat below the 1040 elevation, and in particular below the 1030 elevation, will degenerate and begin to die as soon as water conservation practices are implemented and this zone is periodically inundated during the winter season. The next phase of the project will remove the 17.8 acres of existing southern willow

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scrub areas (below elevation 1030) in a coordinated sediment and debris removal operation once the new willow habitat has become established.

Storm Drain Improvements-JPL**: This project will convert 2.0 acres of sage scrub to southern willow scrub plant community. This area is below the drainage outfalls, along the JPL border, just north of the westside parking lot, where exotic species need to be removed and debris needs to be collected. These particular drainage outfalls drain through a southern willow scrub plant community. Due to wet conditions caused by urban runoff, this project proposes to transition this 2-acre area from a sage scrub plant community to a plant community with willows as the dominant species.

Sage Scrub

There are currently 39.9 acres of sage scrub in the park of which 36.3 acres of habitat will be restored. An additional 6.6 acres of habitat will be established for a new total of 42.9 acres of sage scrub habitat. The following list of the projects is proposed for habitat establishment and restoration of sage scrub:

	Existing	Acres Added or	Proposed
Project	Acres	Subtracted	Acres
Stream Corridor Alignment (Project 1**)	1.7		1.7
Westside Spreading Basins (Project 2 & 3a**)	0.0	3.0	3.0
Eastside Spreading Basins (Project 2 & 3c**)	4.9	1.1	6.0
Stream Channel Widening (Project 4**)	0.0	2.5	2.5
Sunrise Overlook (Project 8)	1.9	-0.9	1.0
Dam Area ~ Spillway Observation -0.2 and			
Adjacent to the Spillway +0.2	13.2		13.2
Eastside Park Area ~ (Oak Woodland** -0.5)			
(East Rim Trail Extension** -0.2)	11.2	-0.7	10.5
Storm Drain Improvements ~ JPL**	7.0	-2.0	5.0
TOTAL	39.9	3.0	42.9

Stream Corridor Alignment (Habitat Project #1**): This project will keep the size of the habitat area unchanged and will restore habitat within the project area.

Westside Spreading Basins (Habitat Project #3a**): There is currently no sage scrub habitat in the area of the proposed Westside Spreading Basins. The existing area is mostly a ruderal plant community. This habitat project proposes to establish 3.0 new acres of sage scrub plant community along the slope east of the spreading basins. The creation of the westside spreading basins will utilize "Landform Grading" principles to improve habitat for this and other plant communities.

Eastside Spreading Basins (Habitat Project #2** and #3c**): The Eastside Spreading Basins project is proposed to have the existing 4.9 acres of sage scrub increased by 1.1 acre to a total of 6.0 acres. The equestrian trail on the west side of the existing spreading basins traverses some of the best old alluvial fan sage scrub in the area, designated as sage scrub on the plant community maps. Project 3c involves spreading basins 5 through 10 on the eastside. The proposal is to abandon the equestrian trail, relocate the trail on the spreading basins maintenance road (asphalt to be removed) and restore the area occupied by the existing trail with sage scrub.

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Stream Channel Widening (Habitat Project #4**): There is currently no sage scrub habitat at this location of the stream channel. On the western slope of the stream channel project, 2.5 acres of sage scrub habitat will be established. This project will widen the stream on its western edge for a new total stream channel width at least twice the current width. Both the east and west sides of the stream channel will be restored with sage scrub habitat.

Sunrise Overlook (Habitat Project #8): There is currently 1.9 acre of sage scrub habitat in this project area, much of which was established by hydroseeding when the freeway access ramp was eliminated from this location. A total of 0.9 acre of this habitat will be converted to oak woodland habitat leaving 1 acre of sage scrub.

Dam Area: This project area currently has 13.2 acres of sage scrub. Although the acreage of habitat will remain the same, 0.2 acre of this habitat will be removed as a result of the spillway observation overlook project, but 0.2 acre will also be added as a result of habitat establishment on the slope adjacent to the dam spillway. The existing 13.0 acres remaining will receive habitat restoration.

Eastside Park Area: A total of 11.2 acres of sage scrub make up the eastside park area. A total of 0.7 acre of sage scrub will be eliminated due to the following projects: (a) 0.5 acre** will be converted to oak woodland east of basin 14 and the overflow basin; and (b) 0.2 acre** will be lost to the east rim trail extension project. The total remaining area in sage scrub within the Eastside Park Area will be 10.2 acres of restored habitat.

Storm Drain Improvements-JPL**: A total of 7.0 acres of sage scrub exists adjacent to JPL in the vicinity of the westside storm drains. This project will convert 2.0 acres of sage scrub to southern willow scrub plant community. This area is below the drainage outfalls, just north of the westside parking lot (Habitat Project #2**) along the JPL border, where exotic species need to be removed, and debris needs to be collected. These particular drainage outfalls drain through a southern willow scrub plant community. Due to wet conditions caused by urban runoff, this 2.0 acre area will be transitioned to a plant community with willows as the dominant species. A total of 5.0 acres will remain in this area as sage scrub plant community.

Riversidian Alluvial Fan Sage Scrub

There are currently 17.2 acres of riversidian alluvial fan sage scrub in the park. An additional 1.6 acres of habitat will be established for a new total of 18.8 acres of riversidian alluvial fan sage scrub habitat. Habitat establishment and restoration for this plant community is defined under Habitat Project #2**. A number of smaller habitat restoration projects within a larger area will occur: a) the Stream Channel Widening Project (Habitat Project #4**) will add one acre of habitat; b) the Westside Spreading Basins Project (Habitat Project #3a**) will eliminate ruderal weedy species and add 0.2 acre of habitat to the embankments of the spreading basins; c) the old east-to-west stream crossing has been abandoned and the asphalt roadway will be removed, adding 0.2 acre of habitat; and d) the various drain outfalls along the JPL border, where exotic species need to be removed and debris needs to be collected, will add another 0.2 acre of riversidian alluvial fan sage scrub.

Mule Fat Scrub

There are currently 19.5 acres of mule fat scrub in the park of which only 10.3 acres will receive habitat restoration. When water conservation measures are implemented, the remaining 9.2 acres of existing habitat will begin to die as the area is frequently inundated. An additional 3.9 acres of habitat will be established along with the 10.3 acres of habitat to be restored. The following list of the projects is proposed for habitat establishment and restoration of mule fat scrub:

	Existing	Acres Added or	Proposed
Project	Acres	Subtracted	Acres
Stream Corridor Alignment (Project 1**)	0.9	0.2	1.1
Westside Spreading Basins (Project 3a**) and			
Stream Channel Widening (Project 4**)	6.7	-1.7	5.0
Relocated Disc Golf (Project 7)	0.0	3.7	3.7
Northern Sycamore Field (Project 7**)	1.5	-1.5	0.0
Water Conservation Pool (Project 13)	1.2		1.2
TOTAL	10.3	0.7	11.0
Habitat Lost Due to Inundation (Water Conservation)	9.2		
TOTAL	19.5		

Stream Corridor Alignment (Habitat Project #1**): This restoration project will increase the existing 0.9 acre of mule fat scrub habitat by 0.2 acre for a total of 1.1 acres in mule fat scrub. The project will shorten the Altadena drain and realign the stream corridor to allow for a more natural stream flow.

Westside Spreading Basins (Habitat Project #3a**) and Stream Channel Widening (Habitat Project #4**): There are currently 6.7 acres of mule fat scrub habitat within these two project areas. These habitat projects propose to eliminate 1.7 acres of this plant community along the upper banks of the stream and in the vicinity of the new spreading basins. The creation of the westside spreading basins will utilize "Landform Grading" principles to improve habitat for this and other plant communities. This project will widen the stream on its western edge for a new total stream channel width of approximately 200 feet.

Relocate Disc Golf (Habitat Project #7): There is currently no mule fat scrub habitat at this location. The Disc Golf Relocation project is proposed to establish 3.7 new acres of mule fat scrub to this area of the park. This restoration project proposes to raise the elevation of the area that has small pockets of existing willow scrub habitat to create drainage courses. Raised terraces of mule fat scrub habitat, a very resilient plant community, will serve to border the fairways. The areas of existing willows will be linked to create drainage courses that will receive less fill than the terraced areas of this project.

Northern Sycamore Field (Habitat Project No.7**): This project will eliminate the 1.5 acre of mule fat present when fill is placed to raise the site above inundation level. The site is a predominantly ruderal and highly disturbed habitat due to past mining operations. There will be some debris removal of broken concrete that was dumped from previous construction projects. Until this project is implemented, the site will be flooded and when water is allowed to pass through the dam, the flooded mule fat will die and a pool of water will remain for some time.

Water Conservation Pool (Habitat Project #11): When water conservation measures are implemented, an existing 9.2 acres of mule fat scrub will die as the area is frequently inundated. This project proposes a phased operation that will permit the areas elevated above the floodplain (elevation 1040.5) and the perimeter of the water conservation pool (elevation 1030) to become established with southern willow scrub habitat. The Water Conservation Pool project will not alter the existing 1.2 acres of mule fat scrub above this zone. The next phase of the project will remove the dying 9.2 acres of existing mule fat scrub areas (below elevation 1030) in a coordinated sediment and debris removal operation.

Southern Sycamore Riparian Woodland

There are currently 2.6 acres of southern sycamore riparian woodland habitat in the park. An additional 22.2 acres will be established for a new total of 24.8 acres of southern sycamore riparian woodland habitat. Habitat Project No.10, as described in Section 3.3 of the HWP Master Plan, reflects the restoration planned for this plant community. The following list of projects is proposed for habitat establishment and restoration of southern sycamore riparian woodland:

Projects	Acres Added
Westside Area	
Around Southern Sycamore Field (Project 7)	2.1
Around Northern Sycamore Field (Project 7**)	4.7
Adjacent to Westside Spreading Basins 15,16 & 17 (Project 3a**)	1.4
Stream Corridor Alignment (Project 1**)	1.4
Eastside Area	
South of and around Johnson Field (Project 10)	3.8
Around existing overflow basin (Project 10)	3.2
Around Eastside Spreading Basins 7-14 (exist. No. 5-12 Project 3c**)	2.6
Around new Eastside Spreading Basins 1 & 2 and expanded	
Spreading Basins 3-6 (exist. No. 1-4 Project 3b**)	3.0
TOTAL ACRES TO BE ESTABLISHED	22.2

Ruderal

It is proposed to replace the total existing 75.4 acres, except the 2.4 acres within the MWD property, in ruderal species with other plant communities, as shown in the proposed plant communities map, or as area within the proposed water conservation pool, which will be cleared of all vegetation below elevation 1030 excavated and graded. The ruderal areas within the designated critical habitat for the federally listed endangered Southwestern Arroyo Toad are proposed to be graded using Land-form Grading principles and restored to eliminate the highly disturbed and unnatural topography, habitat of poor quality, and create habitat of good to excellent quality for native flora and fauna.

Streambed Riparian

There are currently 8.1 acres of streambed riparian habitat in the park, of which 4.9 acres will be destroyed and 5.1 acres of habitat will be established for a new total of 8.3 acres of streambed riparian habitat. The following list of the projects is proposed for habitat establishment and restoration of streambed riparian habitat:

	Existing	Acres Added or	Proposed
Project	Acres	Subtracted	Acres
Two areas inundated (Project 11)	4.9	-4.9	0
Stream Channel Widening (Project 4**)	2.4	5.0	7.4
Stream Corridor Alignment (Project 1**)	0.8	0.1	0.9
TOTAL	8.1	0.2	8.3

Two areas inundated (Habitat Project #13): There are two areas below the existing 1030 elevation that will be frequently inundated when water conservation procedures are implemented. This will cause the existing 4.9 acres of streambed riparian habitat in these areas to die. Therefore, these two areas are proposed to be cleared, excavated, and graded for the Water Conservation Pool (Habitat Project No.13).

Stream Channel Widening (Habitat Project #4**): The stream channel widening project will establish 5.0 additional acres of streambed riparian habitat to an existing 2.4 acres for a total of 7.4 acres of streambed riparian habitat. This restoration project will widen the stream on its western edge for a new total stream channel width of at least double the existing width. Landform Grading principles will be utilized here to improve the habitat for several native plant communities on the western graded slopes. As winter rains saturate the upper watershed, storm water begins to flow through this habitat, over a larger area, increasing the groundwater recharge for the general benefit of the Raymond Basin, as well as providing surface water, encouraging a riparian habitat of higher quality.

Stream Corridor Alignment (Habitat Project #1**): This restoration project will increase the existing 0.8 acre of streambed riparian habitat by 0.1 acre for a total of 0.9 acre. This area is contiguous with the same habitat, immediately north of the JPL Bridge. The project will shorten the Altadena drain and widen the stream corridor to allow for a more natural stream alignment.

Flood Management/Water Conservation Pool

The flood basin behind the dam has been filling with sediment. With an existing capacity of 1,424 acre-feet, it will soon reach the minimum safe capacity of 1,400 acre-feet. Since 1978, when the dam was declared unsafe to hold water, vegetation has been allowed to grow in the 92 acres that will be flooded now that the dam has been reconstructed. When water conservation measures are implemented and this area is inundated, as desired by the proposed plan, this vegetation will begin to die. A major goal of the proposed project is to create habitat of good to excellent quality wherever possible within this highly disturbed Hahamongna basin. To create new habitat above the spillway elevation and increase the capacity of the basin to a maximum of 1,900 acre-feet and to allow for 500 acre-feet of inflowing sediment capacity, this project will move 378 acre-feet of material on-site and remove 243 acre-feet of material off-site. This will reduce the area frequently inundated to 69 acres and create 23 acres of new recreational and habitat area and five acres of new streambed riparian habitat. Floodwater retained in the 69-acre flood management pool will be pumped back to the spreading basins located at higher elevations. The 69-acre flood management pool will include 14.6 acres of riparian habitat around the perimeter extending up the widened intermittent stream channel. This habitat could be inundated during storm events. This will leave a 54.4 acre Water Conservation Pool to better manage inflowing sediment and floating debris and to retain as much storm water as possible. In addition to pumping this water back for metered groundwater recharge, this water conservation pool will provide a higher local water table, encouraging a riparian habitat of higher quality, and will provide groundwater recharge for the general benefit of the Raymond Basin.

	Acres
Area of Flood Management Pool	
after increasing capacity (at elevation 1040)	69.0
Habitat:	
Willow habitat (elevation 1030 to 1040)	5.7
Streambed Riparian (elevation 1025 to 1040)**	7.4
Riversidian Alluvial Fan Sage Scrub (area below 1040 elevation)**	1.0
Southern Sycamore Riparian Woodland (inundated Flint Wash)	0.5
TOTAL ACRES TO BE INFREQUENTLY INUNDATED	14.6
AREA OF WATER CONSERVATION POOL (no habitat)	54.4

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UTILITIES

Underground Pasadena's Eastside Overhead Power and Communication Lines

This project element will underground existing Pasadena overhead power and communication lines that run north and south on the east side of the park. The project will occur in two phases; the first phase will be to underground these overhead distribution lines from the VOC WTP to the Arroyo Well. The second will be to underground overhead distribution lines from the VOC WTP to Johnson Field.

Relocate the Existing Southern California Edison Power Line in the Hahamongna Basin

This project will minimize the number of overhead basin crossings as well as remove this line from the sensitive Riversidian Alluvial Fan Sage Scrub habitat, which restricts the maintenance of this utility. This overhead distribution line that runs diagonally across the basin from the JPL substation to the Windsor/Ventura intersection would be relocated. The new alignment would run North to the east-west distribution lines, adjacent to the proposed North Bridge, crossing the basin with the existing lines, then running south, along the existing Gabrielino Trail, and reconnecting to the existing SCE power distribution line along Altadena Drive.

Relocate the Existing Pasadena Power and Communication Line

This project will relocate the existing Pasadena power and communication line that traverses the basin from the VOC WTP to the MWD property and northern portions of the west side of the park. This utility will be relocated due to the undesirable aesthetics of these poles, the erosion of the pole bases, and the inaccessibility for maintenance in the Widen Stream Channel and Establish Riparian Habitat project area. The communication portion of this line will be relocated to a new line that will run to JPL from the Windsor-Ventura intersection north along the Gabrielino trail.

The power portion of this line will be relocated to the Pasadena grid that crosses the Devil's Gate Dam to feed facilities in the westside portion of the park. This alignment will go from the dam to Foothill Boulevard (preferably underground) and provide a new feed to OGMO, the Equestrian Staging Area restroom, the new restroom near the Oak Grove Field, the group picnic shelters south of the Oak Grove Field, the park ranger station, the existing restroom in the overnight area, and the group picnic shelters in the overnight camping area

Relocate the SCE North/South Transmission and South Distribution Line

These lines currently follow the toe of the western slope of the park, run the length of the basin from south to north and feed into and from JPL's main substation. The bases of 11 of the 21 power poles are frequently inundated during heavy storm events, making it impossible to access these poles. The poles will either be relocated to an alignment in Oak Grove Drive or be raised to an appropriate height in their current location after the westside perimeter trail, relocated disc golf, and improved parking lot areas are constructed with fill to raise the area above the seasonally inundated elevation of 1040.5 (spillway elevation). Relocation of the poles to Oak Grove drive is the preferred solution. Prior to implementing the proposed grading of the Flood Management/Water Conservation Pool, an analysis of alternative improvements or relocation of this utility will be completed for review and approval. This will guarantee the safety and stability of this critical utility. A mutual agreement between SCE and the City of Pasadena (and potentially other entities such as JPL, MWD, and the city of La Cañada-Flintridge) will need to be worked out.

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SECURITY, SAFETY & ACCESSIBILITY

Two types of security fencing will be used. Decorative fencing consisting of some type of iron fencing with or without the use of Arroyo stone (as pillars or as a low wall on which an iron fence could be placed) will be used where appropriate and conform to the Arroyo Seco Design Guidelines. Chain link fencing will be used in areas where security fencing is needed but aesthetics are not an issue. Decorative security fencing is recommended at the following locations:

- At the south end of the park, from the west side of Flint Wash adjacent to Oak Grove Drive, north to the Gould Canyon Trail tunnel at Foothill Blvd.
- At the Windsor Avenue and Ventura Street entrance between Mountain View and Ventura Street, along the west side of Windsor Avenue.
- At the west end of Altadena Drive where a trail enters the park.

Gates will be needed at the westside tunnel entrance under Oak Grove Drive, to prevent entry onto the dam from the new parking lot at Oak Grove Drive and Linda Vista during park closure. Chainlink security fencing will be used at the end of La Canada Verdugo Road and Oak Grove Drive from the Woodbury on-ramp to Flint Wash.