TABLE 7.3-1
DRY WEATHER MONITORING,
NUTRIENTS, GENERAL MINERALS, BACTERIAL AND MISCELLANEOUS ANALYSES

Dry Weather Monitoring														
Nutrients, General Minerals, Bacterial and Miscellaneous Analyses														
Sample Location	Sample Date	Phosphorus Dissolved	Dissolved Ortho-phosphate	Nitrate (as N)	Nitrite (as N)	TKN	Ammonia (an N)	Hardness (as $CaCO_3$)	TDS	TSS	TRPH	Total Coliform	Fecal Coliform	Enteroccoci
11	5/23/2002	0.087	0.087	0.13	0.1 U	2.9	1.8	480	1,200	5.8	1 U	5,000	230	40
12	5/29/2002	0.076	0.068	1.10	1.0 U	3.6	0.1 U	2000	8,700	1 U	1 U	20 U	20 U	130
13	5/23/2002	0.073	0.044	1.20	0.1 U	4.2	1.1	830	1,600	7.4	1 U	240,000	230,000	1,700

TKN = Total Kjeldahl Nitrogen; TDS = Total Dissolved Solids; TSS = Total Suspended Solids; TRPH = Total Recoverable Petroleum Hydrocarbons; $CaCO_3$ = Calcium Carbonate
All concentrations are reported in milligrams per liter (mg/L), except for coliform and enterococci, which are in most probable number (MPN)/100 mL.
N = nitrogen
U = Not detected at a concentration greater than the reporting limit shown.

Source: Huntington Beach 2005a (Table 3-1).

TABLE 7.3-2
DRY WEATHER MONITORING, TOTAL DISSOLVED METALS

Dry Weather Monitoring																	
Total and Dissolved Metals																	
Sample Location	Sample Date	Arsenic Total	Arsenic Dissolved	Cadmium Total	Cadmium Dissolved	Chromium Total	Chromium Dissolved	Copper Total	Copper Dissolved	Iron Total	Iron Dissolved	Lead Total	Lead Dissolved	Nickel Total	Nickel Dissolved	Zinc Total	Zinc Dissolved
11	5/23/2002	2.21	2.21	0.2 U	0.2 U	1 U	1 U	1 U	1 U	3,280	265	1 U	1 U	3.28	3.74	10.5	23.4
12	5/29/2002	8.93	4.96	0.2 U	0.2 U	1 U	1 U	6.04	2.88	161	67.2	1.37	1 U	3.88	3.07	81.1	40.2
13	5/23/2002	0.5 U	0.88	0.2 U	0.2 U	1.28	1 U	1.93	1 U	2,600	115	1.65	1 U	6.39	4.87	61.8	49.3

TKN = Total Kjeldahl Nitrogen; TDS = Total Dissolved Solids; TSS = Total Suspended Solids; TRPH = Total Recoverable Petroleum Hydrocarbons
All concentrations are reported in milligrams per liter (mg/L), except for coliform and enterococci, which are in MPN/100 mL.
U = Not detected at a concentration greater than the reporting limit shown.

Source: Huntington Beach 2005a (Table 3-2).

Dry weather runoff, which occurs throughout the year when there is no precipitation-generated runoff, is generated by sources such as landscape irrigation; driveway and sidewalk washing; non-commercial vehicle washing; groundwater seepage; fire flow; potable water line operations and maintenance discharges; and permitted or illegal non-storm water discharges. As both Huntington Harbour and Anaheim Bay are downstream receiving waters for the EGGWC, the CURMP has identified EGGWC drainage improvements as a means to address the water quality issues generated by these sources of flow. Development of a constructed wetland within Central Park has been formulated as a Best Management Practice (BMP) within the CURMP with the objective of improving overall water quality within the watershed and within the impaired hydrological systems of Huntington Harbour and Anaheim Bay. The overall objective of the proposed project is the improvement of water quality in these downstream water bodies through the optimal treatment and beneficial use of this flow within the Central Park system, with little to no flow discharge out of the system back into Talbert Channel and Outer Bolsa Bay.

7.4 PROPOSED PROJECT ELEMENTS

As stated above, the goal of the Talbert Lake Diversion Project is the improvement of water quality within the downstream receiving waters of the EGGWC, including Huntington Harbour, Anaheim Bay, and outer Bolsa Bay. The project will divert dry weather runoff from the EGGWC to a constructed treatment wetland in the Talbert Lake area of Central Park. Accordingly, the proposed project impact area will include: (1) the channel diversion location near the intersection of Goldenwest Street and the EGGWC; (2) tie-in locations to either an existing water line in Goldenwest Street or an existing storm drain in Gothard Street; and (3) the northeastern corner of Central Park bound by Goldenwest Street, Gothard Street, Slater Avenue, and Talbert Avenue.

The proposed project (Exhibit 7.1-2, Proposed Project Overview) will divert available dry weather urban runoff from the EGGWC approximately 4,512 feet south to Central Park, from the intersection of either the flood-control channel and Goldenwest Street or the flood-control channel and Gothard Avenue. This will be accomplished by one of six potential diversion concepts, detailed below. Up to 3 mgd would be pumped from the channel to Central Park, where flow will enter a series of constructed wetlands for water quality treatment (Exhibit 7.1-3). This diverted flow would be distributed to several discharge points at the northeastern corner of Central Park, with each discharge point leading into a series of shallow wetlands and ponds, and eventually into a restored Talbert Lake.

The constructed wetlands system will be managed to utilize all dry weather flows on site by balancing park irrigation volumes, passive infiltration capacities, and evaporation (under dry weather conditions no flows will be discharged back into Talbert Channel). Under conditions of high precipitation and storm flow, a modified overflow weir, located at the western edge of the project site (approximately 125 feet south of the Goldenwest Street parking lot), would serve to evacuate excess flows from Talbert Lake into Talbert Channel.

The proposed project is discussed herein in detail and includes: the Low-Flow Diversion element in the EGGWC; the Central Park Water Distribution System; the Wetland Treatment System; and Talbert Lake. Project construction will be phased; the Diversion element, Central Park Water Distribution System, Wetland Treatment System, and riparian habitat creation/enhancements will be implemented in the first phase of construction (Phase 1); Talbert Lake modifications will occur in the second phase of construction (Phase 2), approximately one to three years after completion of Phase 1. Standard Conditions (SCs) that will apply to the project are also identified in the appropriate sections.

7.4.1 EAST GARDEN GROVE – WINTERSBURG FLOOD CONTROL CHANNEL LOW-FLOW DIVERSION

In the vicinity of the proposed flow diversion structure, the EGGWC is a rectangular concrete channel approximately 75′ wide and 14′ high (Exhibit 7.4-1, Site Photos, EGGWC Diversion). EGGWC monitoring data indicate that dry weather urban runoff typically ranges in volume between 0.5 mgd and 1.5 mgd (PACE 2007). The EGGWC diversion feature would include multiple sediment removal and storage elements and would ensure that the channel's function as a flood-control facility is unaffected by the proposed project.

Six diversion concepts are under consideration and evaluation; all diversion concepts are designed to reduce channel velocities so that low-flows can be captured and taken out of the channel for treatment. Diversion Concepts 1–3 would consist of a diversion structure within the channel; sediment-control features; a pump station located under the access road immediately adjacent to the channel at the diversion site; and a pipeline connecting the pump station to Goldenwest Street. This pipeline carrying diverted flows would connect to an existing water line that runs along Goldenwest Street to Central Park, which is proposed for joint use along with another City project. Integration of the Talbert Lake Diversion Project and the Well 8 Capital Improvement Project is described under Diversion Concept 1 below. Pump station design would slightly differ for each diversion concept, but would generally consist of an intake structure, submersible pumps, and a wet well for water treatment. Diversion Concepts 4–6 would utilize the same diversion structure described for Concepts 1–3, but would install new pipeline from the diversion site east to the existing storm drain system within Gothard Avenue; the route would flow into the project via the Slater storm drain.

The final selection of diversion method and flow delivery alignment will ultimately be made based upon engineering feasibility and product availability.

The EGGWC pump station would be sized for an ultimate capacity of up to 3 mgd, based on channel dry weather flow variations.

As a Standard Condition of the project, a detailed Operation and Maintenance (O&M) Manual, which details operation and maintenance requirements of the diversion structure, would be coordinated and approved by both the City of Huntington Beach and the Orange County Resources and Development Management Department (OCRDMD) to ensure that the channel's flood-protection performance is not affected.

SC-1 An Operation and Maintenance (O&M) Manual for the diversion structure will be coordinated with and approved by the City of Huntington Beach and the County of Orange RDMD.

<u>Diversion Concept 1</u>

Diversion Concept 1 consists of an inflatable rubber dam that runs the entire width of the EGGWC (75 feet) to ensure that tidal waters that move up the channel do not enter the diversion pump station (for photos of a similar structure on Talbert Channel see Exhibit 7.4-2). This rubber dam, wet well, and pump station would be located just west of Goldenwest Street within the OCRDMD's right-of-way, minimizing piping to the existing water line within Goldenwest Street. Several inlets would be constructed along the invert of the low-flow channel in order to divert water that has ponded behind the structure into a forebay for the purpose of sediment settling water treatment. The flow intake would consist of a transfer pipe that penetrates the side of the EGGWC and the wet well vault. The pump station would be located under the existing access road on the southern side of the channel, with the intake extending from the channel wall over to the EGGWC low-flow channel (Exhibit 7.4-3). The pump station would be designed to have a total capacity of up to 3 mgd.

Dry weather flows would be allowed to collect behind the dam to a controlled level before the pump system is activated, resulting in ponded water averaging 2.5 feet in depth behind the dam and extending about 2,250 feet upstream from the diversion structure. This project feature would allow for a high percentage of suspended solids in the channel flow to settle out of the water column while flows are still in the channel, removing the need for a prefabricated grit removal unit upstream of the wet well. In this way, the ponded water upstream of the diversion structure would act as a desilting area to remove coarse sediment and debris prior to its diversion into Central Park. The rubber dam would be deflated to allow storm flows to pass in wet weather conditions, similar to the operation of the County of Orange's existing rubber dam in Talbert channel.

An Operation and Maintenance (O&M) Plan would be developed that includes detailed information regarding the conditions under which the dam would be deflated and subsequently re-inflated to ensure no impact or alteration of the EGGWC's flood-control capacity. No damage is expected to occur to the intake structure during high flow events, minimizing after-storm maintenance.

Diverted flows would be pumped into Central Park through a water line within Goldenwest Street. This water line is currently functioning as a distribution line within the City's potable water delivery infrastructure. There is an approved Capital Improvement Project now on record that confirms the City's intent to connect this line to Well 8 within Murdy Park. Well 8, which produces potable (although off-color) water is not currently being utilized. The Well 8 Capital Improvement Project will use the water line in Goldenwest Street to carry potable well water for irrigation of the Senior Center, Sports Park, and Murdy Park.

If selected as the preferred water delivery option for the proposed project, the Well 8 Capital Improvement Project and the Talbert Lake Diversion Project will be integrated to ensure compatible joint use of the water line. Accordingly, under this option the water line in Goldenwest Street will be used to deliver EGGWC flows to the treatment wetland trains within Central Park; water entering Talbert Lake from the wetland treatment trains could then be used to help meet the City's irrigation requirements for Central Park, the Sports Complex, and the Senior Center. If diverted water volumes do not provide high enough lake levels in Talbert Lake to serve this purpose, Well 8 water will be pumped into Talbert Lake via the Goldenwest water line to maintain high enough lake levels to meet remaining irrigation requirements. As a project design feature (PDF-1), the wet well and pump station at the diversion site will be designed to accommodate water from both the channel and Well 8 in a manner that ensures diverted flows from the EGGWC would not impact Well 8 as a potable water source.

PDF-1 Design of the wet well and water distribution system at the diversion site will incorporate features to ensure diverted flows cannot traverse the Goldenwest water line back into Well 8.

View 1: View from Goldenwest Street from south side of the East Garden Grove-Wintersburg Channel looking east.

View 2: View from Goldenwest Street from south side of the East Garden Grove-Wintersburg Channel looking west.

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Site Photos, East Garden Grove-Wintersburg Channel Diversion Exhibit 7.4-1

Talbert Lake Diversion Project

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Rubber Dam

Rubber Dam

Existing Rubber Dam Diversion, Talbert Channel

Exhibit 7.4-2

Talbert Lake Diversion Project

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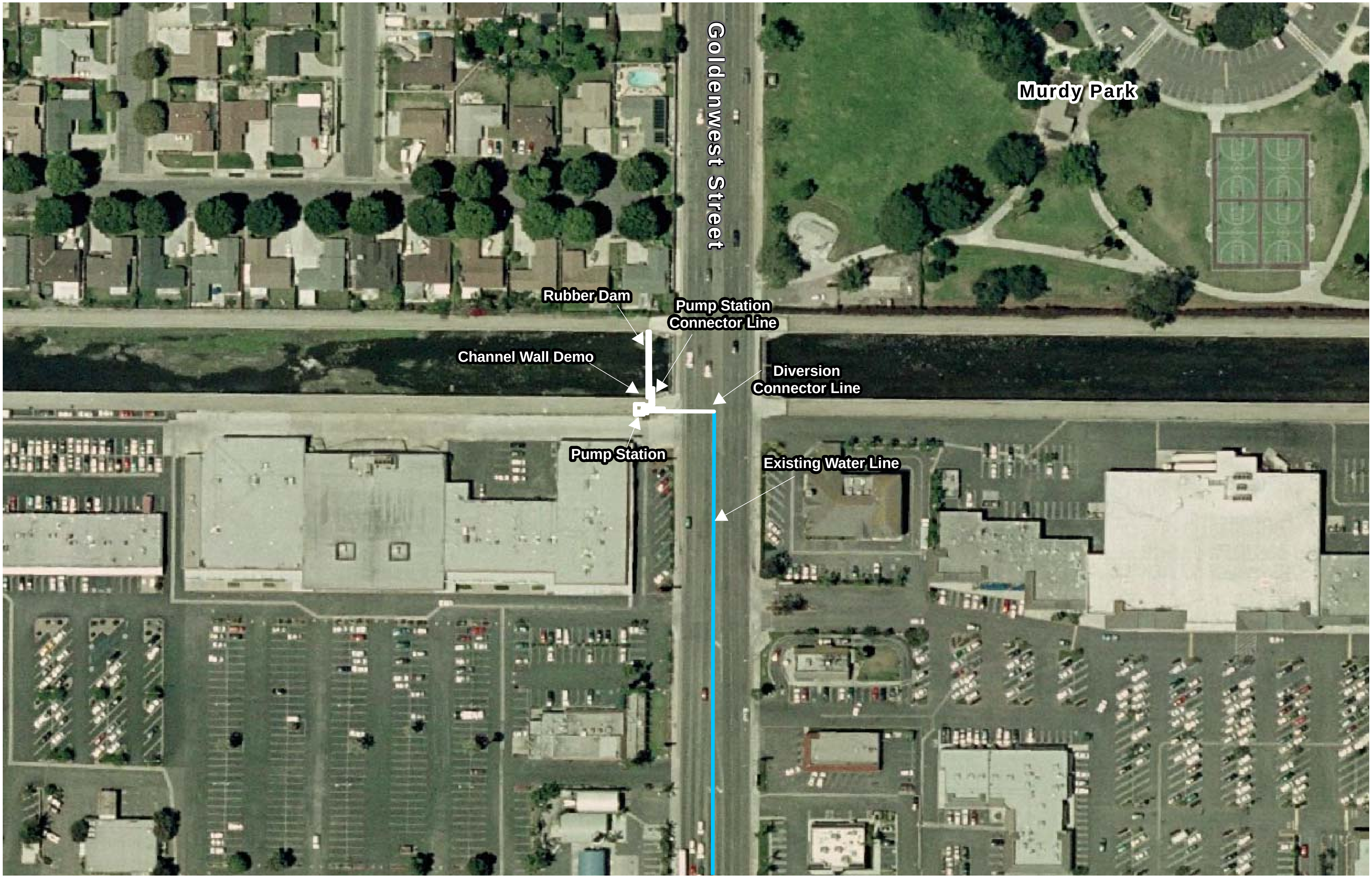

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Channel Diversion Concept 1

Exhibit 7.4-3

Talbert Lake Diversion Project

N W E S

150 75 0 150 Feet

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Diversion Concept 2

Diversion Concept 2 would consist of an inflatable rubber dam approximately 30 feet in length that would block only a portion of the entire 75-foot EGGWC width (Exhibit 7.4-4). This diversion structure would be located 1,160 feet upstream of Goldenwest Street and is sited for construction at the point where average tidal flows retreat (WorleyParsons Komex 2006a). The inflatable structure would prevent higher tidal flows that remain contained within the low-flow channel from mixing with the dry weather channel flows from upstream.

The pump station for this concept would be located in the OCRDMD's right-of-way under the existing access road on the southern side of the channel, with the intake extending from the channel wall over to the EGGWC low-flow channel (Exhibit 7.4-4). The pump station would be designed to have a capacity of up to 3 mgd. The intake would protrude nine inches above the channel floor and would be covered with steel grating to prevent clogging from trash and debris. Three fiberglass baffles[7] located in the low-flow channel would also collect a portion of large debris transported by channel flow. A degrit vortex unit[8] would be placed upstream of the wet well under the access road to intercept sediment. The ponded water upstream of the diversion structure would also provide a desilting area for the removal of coarse sediment and debris prior to its diversion out of the channel. A forebay would provide a secondary sedimentation location for additional removal of settleable solids. Ponding under this concept is expected to extend 1,150 feet upstream behind the dam at an average depth of about 1.4 feet. Epoleon® would be applied to control odors associated with ponded water.

One forcemain pipe will run the 1,160-foot distance from the diversion location to Goldenwest Street and would connect to the existing water line for transport to Central Park (see summary of water line operation under Diversion Concept 1). Diversion Concept 2's impact footprint (within Goldenwest Street) is the same as that described for Diversion Concept 1.

As with Diversion Concept 1, the partial dam for Diversion Concept 2 would be deflated for storm events, maintaining unobstructed operation of the EGGWC as a flood-control facility. An O&M Plan would be developed with detailed information regarding the conditions under which the dam would be deflated and subsequently re-inflated to ensure no impact or alteration of the EGGWC's flood-control capacity. No damage is expected to occur to the intake structure during high flow events, minimizing after-storm maintenance.

Diversion Concept 3

Diversion Concept 3 would deepen the EGGWC's low-flow channel by four feet and fiberglass baffles and a small check dam would be installed in the low-flow channel (Exhibit 7.4-5). An eight-foot-wide diversion channel will lead off from the deepened low-flow channel into a degrit vortex unit. The low-flow check dam would prevent some salt water from reaching the unit during higher high tides, which could result in unwanted intermixing of fresh and salt water flows. The fiberglass baffles would slow the flow velocities and would increase residence time in the channel by encouraging sediment to settle out of the flow stream in the channel itself and to function in tandem with the degrit vortex unit to remove the remaining solids. The ponded water upstream of the diversion system would act as a desilting area to remove coarse sediment and debris prior to its diversion to Central Park. Ponding under this concept is expected to extend 1,150 feet behind the dam, at an average depth of 1.4 feet. Epoleon® would be applied for odor-control purposes. A forebay would provide a secondary sedimentation location for

[7] a device that regulates flow
[8] a structure designed to remove sediment and grit

additional removal of settleable solids. Pump station capacity is consistent for all diversion concepts (i.e., up to 3 mgd based on available dry-weather channel flows).

Similar to Diversion Concept 2, one forcemain would run the 1,160-foot distance to Goldenwest Street. The diverted flow would then be pumped into the water line that runs along Goldenwest Street and into Central Park. Employment of this pipeline would isolate the diversion-related construction activities so they are entirely within the EGGWC right-of-way and within the Goldenwest Street right-of-way adjacent to Central Park.

This concept possesses the highest risk for storm damage to the diversion structure during major flow events, likely necessitating periodic baffle replacement/reconstruction. An O&M Plan would be developed with detailed information regarding the conditions under which the baffles would need replacement, as well as sediment and debris removal requirements (SC-1).

Diversion Concept 4

Diversion Concept 4 includes the construction of the full rubber dam channel diversion structure within the EGGWC at the same location (just west of Goldenwest Street) and built to the same design as that presented for Diversion Concept 1. Under Diversion Concept 4, dry weather flows in the EGGWC would be collected and pumped from behind the full rubber dam into a newly constructed forcemain pipe extending east from the diversion location to an existing storm drain line located near the intersection of Gothard Street and Warner Avenue. The pump station would be located in the OCFCD right-of-way under the existing access road on the southern side of the channel, with the intake extending from the channel wall to the EGGWC low-flow channel. The newly constructed forcemain pipe would run about 2,000 feet east from the pump station below the EGGWC access road to Gothard Street, and about 800 feet south along Gothard Street to a point just south of Warner Avenue (Exhibit 7.4-6). At this junction with the existing storm drain system, diverted flows will gravity-flow approximately 4,000 feet through the existing storm drain system into Central Park via a storm drain located immediately adjacent to the Slater Avenue parking lot.

The exact location of the full rubber dam under this concept will be determined in final design. To minimize construction of new pipeline, the rubber dam could be placed at any site in the EGGWC between the location as described herein up to the location of the modified low flow channel closer to Gothard Avenue.

Upon discharging into the small channel adjacent to the Slater Avenue parking lot, diverted flows will move through the existing swale that follows the walking trail around the northwestern corner of Central Park. An underground pump station would also be constructed adjacent to the drainage ditch at the northwestern corner of the park to distribute flows to the head of each wetland train for treatment. This pump station will be designed for a maximum flow rate of 3 mgd, but would be able to accommodate reduced flow rates as low as 0.5 mgd to account for variations in EGGWC flow.

Diversion Concept 5

Diversion Concept 5 includes the construction of the partial rubber dam channel-diversion structure within the EGGWC, at the same location (1,160 feet upstream/east of Goldenwest Street) and built to the same design as that presented for Diversion Concept 2. Under Concept 5, the partial rubber dam would collect dry weather flows in the channel and pump the diverted water into a newly constructed forcemain pipe that would extend east from the diversion location to the existing storm drain line located south of the intersection of Gothard Street and Warner Avenue. The pump station for this concept would also be located in the OCFCD right-of-way under the existing access road on the southern side of the channel, with

Channel Diversion Concept 2

Exhibit 7.4-4

Talbert Lake Diversion Project

150 75 0 150
Feet

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Channel Diversion Concept 3

Exhibit 7.4-5

Talbert Lake Diversion Project

N W E S

150 75 0 150 Feet

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Channel Diversion Concept 4

Exhibit 7.4-6

Talbert Lake Diversion Project

N W E S

150 75 0 150 Feet

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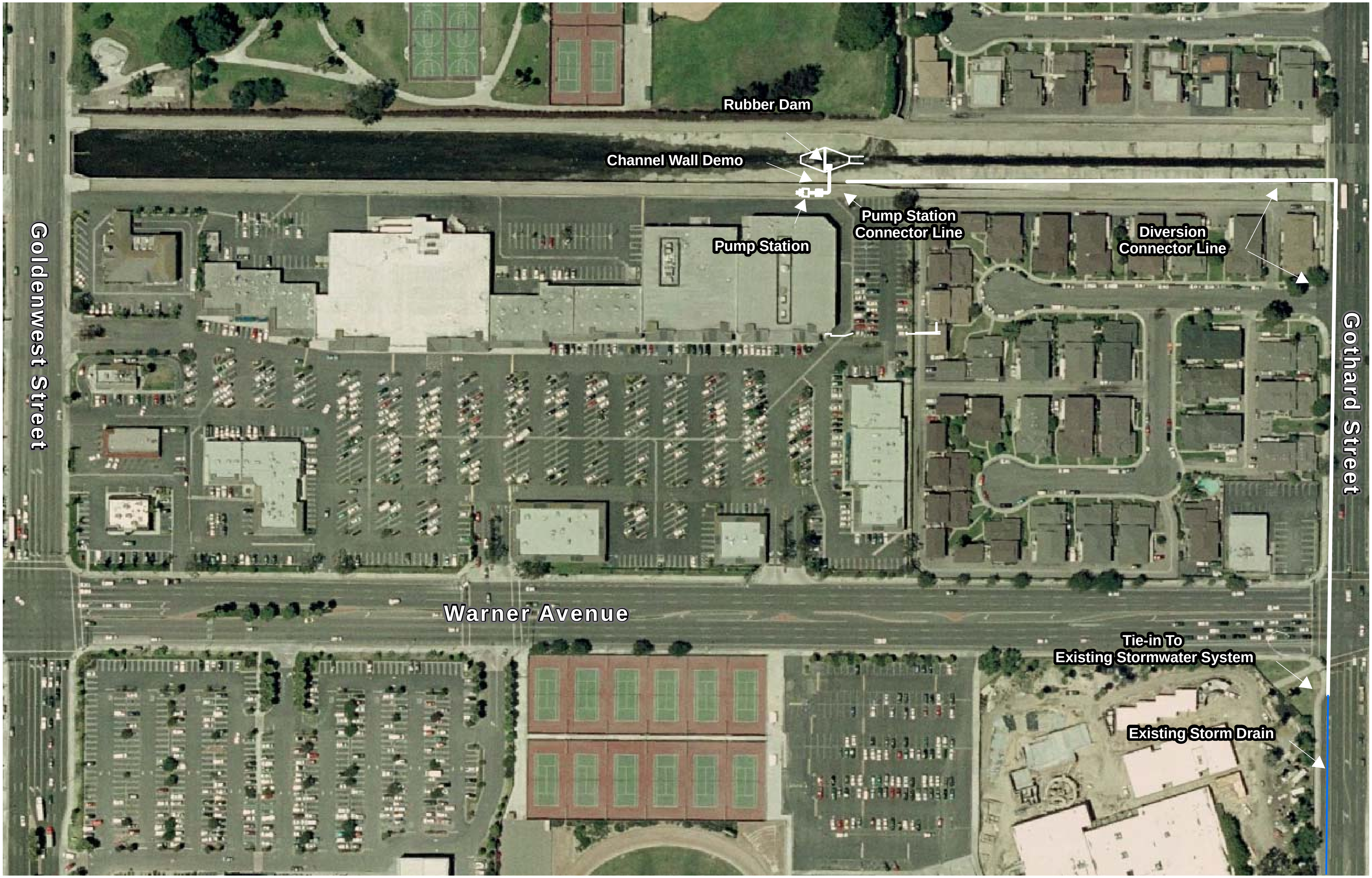

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Channel Diversion Concept 5

Exhibit 7.4-7

Talbert Lake Diversion Project

N W E S

200 100 0 200 Feet

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the intake extending from the channel wall to the EGGWC low-flow channel. The newly constructed forcemain pipe for this concept would run about 700 feet east from the pump station below the EGGWC access road to the storm drain line in Gothard Street, and about 800 feet south along Gothard Street to a point just south of Warner Avenue (Exhibit 7.4-7). At this junction with the existing storm drain system, diverted flows would gravity-flow approximately 4,000 feet through the existing storm drain system south along Gothard Street, west along Slater Avenue, and into Central Park via a storm drain located immediately adjacent to the Slater Avenue parking lot.

Diverted flows entering the park will follow the same flow path and utilize the same pump station constructed adjacent to the walking path at the northwestern corner of the park, described above for Diversion Concept 4.

Diversion Concept 6

Diversion Concept 6 includes the construction of the modified low-flow channel as the diversion method within the EGGWC at the same location (1,160 feet upstream/east of Goldenwest Street) and built to the same design as that presented for Diversion Concept 3. Under Concept 6, the modified low-flow channel would collect dry-weather flows and pump the diverted water into a newly constructed forcemain pipe that extends east from the diversion location to the existing storm drain line located south of the intersection of Gothard Street and Warner Avenue. The pump station for this concept would also be located in the OCFCD right-of-way under the existing access road on the southern side of the channel, with the intake extending from the channel wall to the EGGWC low-flow channel. The newly constructed forcemain pipe for this concept would also run about 800 feet east from the pump station below the EGGWC access road to the storm drain line in Gothard Street, and about 800 feet south along Gothard Street to a point just south of Warner Avenue (Exhibit 7.4-8). As with Diversion Concepts 4 and 5, diverted flows would gravity-flow approximately 4,000 feet from the junction of the new forcemain and the existing storm drain line south along Gothard Street, west along Slater Avenue, and into Central Park via a storm drain located immediately adjacent to the Slater Avenue parking lot.

Diverted flows entering the park would follow the same flow path and utilize the same pump station adjacent to the drainage ditch at the northwestern corner of the project site described above for Diversion Concepts 4 and 5.

7.4.2 CENTRAL PARK WATER DISTRIBUTION SYSTEM

Exhibit 7.4-9 illustrates the features of the water distribution system for the Central Park element of the proposed project, consistent with Diversion Concepts 1–3 (utilizing the Goldenwest water line). Approximately 480 feet south of the intersection of Goldenwest Street and Slater Avenue, a 14-inch pipe would branch off from the existing water line carrying the diverted flow from the EGGWC into Central Park. The incoming flow would be divided into the three forebays located at the upstream end of each wetland train through a series of pipes varying in size from between 6 inches and 14 inches in diameter, depending upon design requirements for optimal flow velocity and minimization of sediment buildup in the lines. The distribution of flow volumes to each wetland train is based on the size of the wetland train relative to the retention time and treatment level for its total volume.

Exhibit 7.4-10 illustrates the features of the water distribution system that accompany Diversion Concepts 4–6. For these concepts, water would enter the Park via the Slater Avenue storm drain and flow into the unimproved drainage channel at the northwestern corner of the park. A pump station located adjacent to this drainage channel would pump flows up to the forebay of each wetland treatment train.

Each distribution line would enter the wetland train forebay at the most upstream end of the system. Duck bill valves would be placed at the outfall of each distribution line to prevent backflow. Additional trash and grit removal is not anticipated as a maintenance concern for the wetland trains based on the sediment removal techniques being designed into the diversion system. A trash box would only be implemented in the forebay of the easternmost wetland treatment train, which accepts stormflow from within the park.

Ball valves would be used on each distribution line and throttled to meet the desired flow rate. These valves would be manually operated by the maintenance staff and housed in precast vaults with completely removable lids for easy access and maintenance. Each line would contain a magnetic flowmeter to assist in adjusting flow distribution.

7.4.3 WETLAND TREATMENT SYSTEM

The existing condition of the project site is not well suited for natural water quality treatment purposes due to poor hydraulic flow characteristics, problematic sedimentation patterns, poor oxidation, and inadequate/inappropriate biomass on site needed for pollutant uptake (PACE 2007). To achieve water quality improvement objectives, proper flow within the system must be maintained in order to adequately transport pollutants to the biological organisms performing the treatment.

In order to develop a natural treatment system capable of achieving the water quality improvement objectives for the incoming EGGWC diverted flows, the wetland portions of the park would need to double in surface area and triple in water treatment volume/capacity. Anticipated inflows are projected to be between 0.5 and 3.0 mgd, but would likely average approximately 1.0 mgd based on flow monitoring in 2007 (PACE 2007). As indicated above, although the diverted flows are expected to carry a high sediment load, sediment removal methods at the diversion site are expected to remove most of the debris and settleable solids prior to discharge within Central Park.

The natural treatment system flow through the park would be designed to reduce the remaining suspended solids, trace metals, nutrients, and organics contained in the diverted flows by incorporating them into natural cycles present in wetland systems. This would be achieved through the design of the system to optimize naturally occurring processes such as plant uptake, bacteria and protozoa substrate utilization, and denitrification. Other engineered processes would also be implemented to increase the hydraulic residence time and treatment potential of the system while optimizing aesthetic and habitat values.

Once flows have passed through the wetland trains (linear wetland features connected with shallow ponds) and have been processed, they would ultimately be retained in a restored Talbert Lake for "polishing" (refining). Ultimate proposed modifications to Talbert Lake include deepening the existing lake bottom and installing several additional water quality enhancement features such as aeration devices and biofilters.

Wetland Treatment Elements

The wetland treatment system would be comprised of 3 separate treatment trains, each containing a meandering channel that varies from 30 to 40 feet in width, with intermittently placed ponds 6 to 10 feet deep within the channels (Exhibit 7.4-11). The three treatment trains ultimately combine at the downstream end into a series of specialized treatment cells positioned immediately adjacent to the inlet into Talbert Lake. The design of the wetland trains would reflect hydraulic flow requirements for contaminant uptake and would include features that would help avoid excessive ponding under storm flow conditions.

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Channel Diversion Concept 6

Exhibit 7.4-8

Talbert Lake Diversion Project

N W E S

250 125 0 250 Feet

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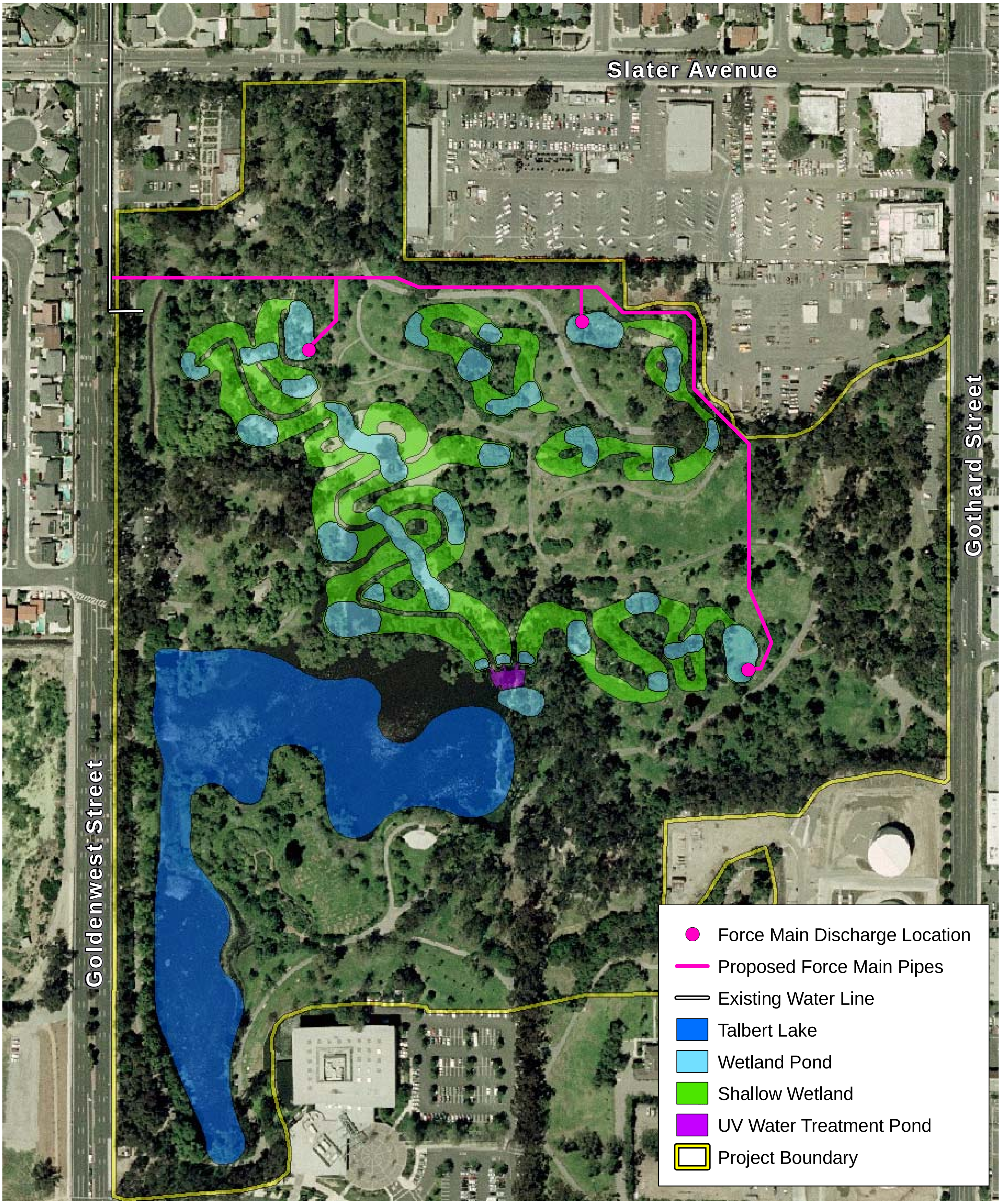

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Central Park Water Distribution System, Diversion Concepts 1-3 — Exhibit 7.4-9

Talbert Lake Diversion Project

N W E S

300 150 0 300 Feet

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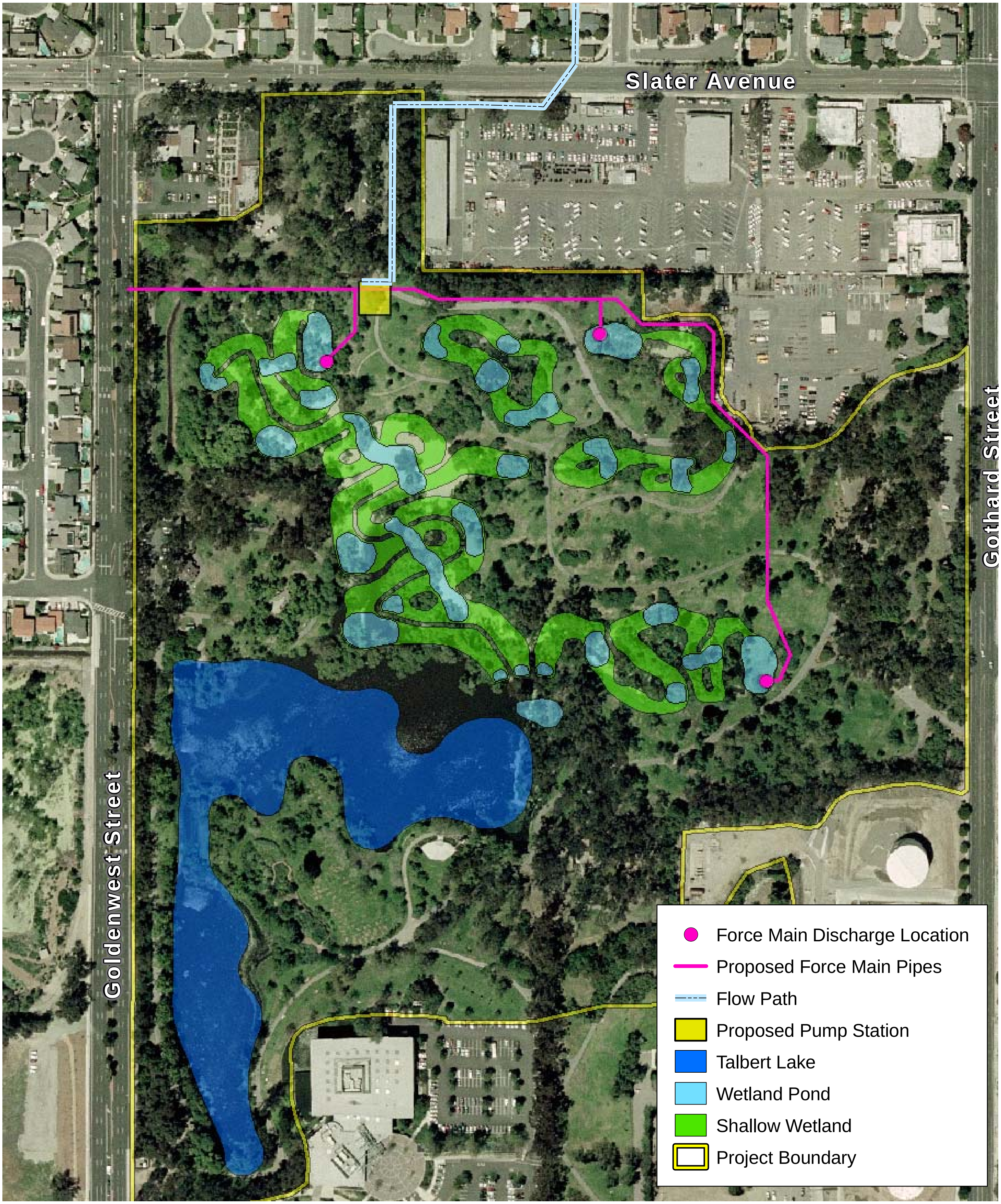

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Central Park Water Distribution System, Diversion Concepts 4-6 Exhibit 7.4-10

Talbert Lake Diversion Project

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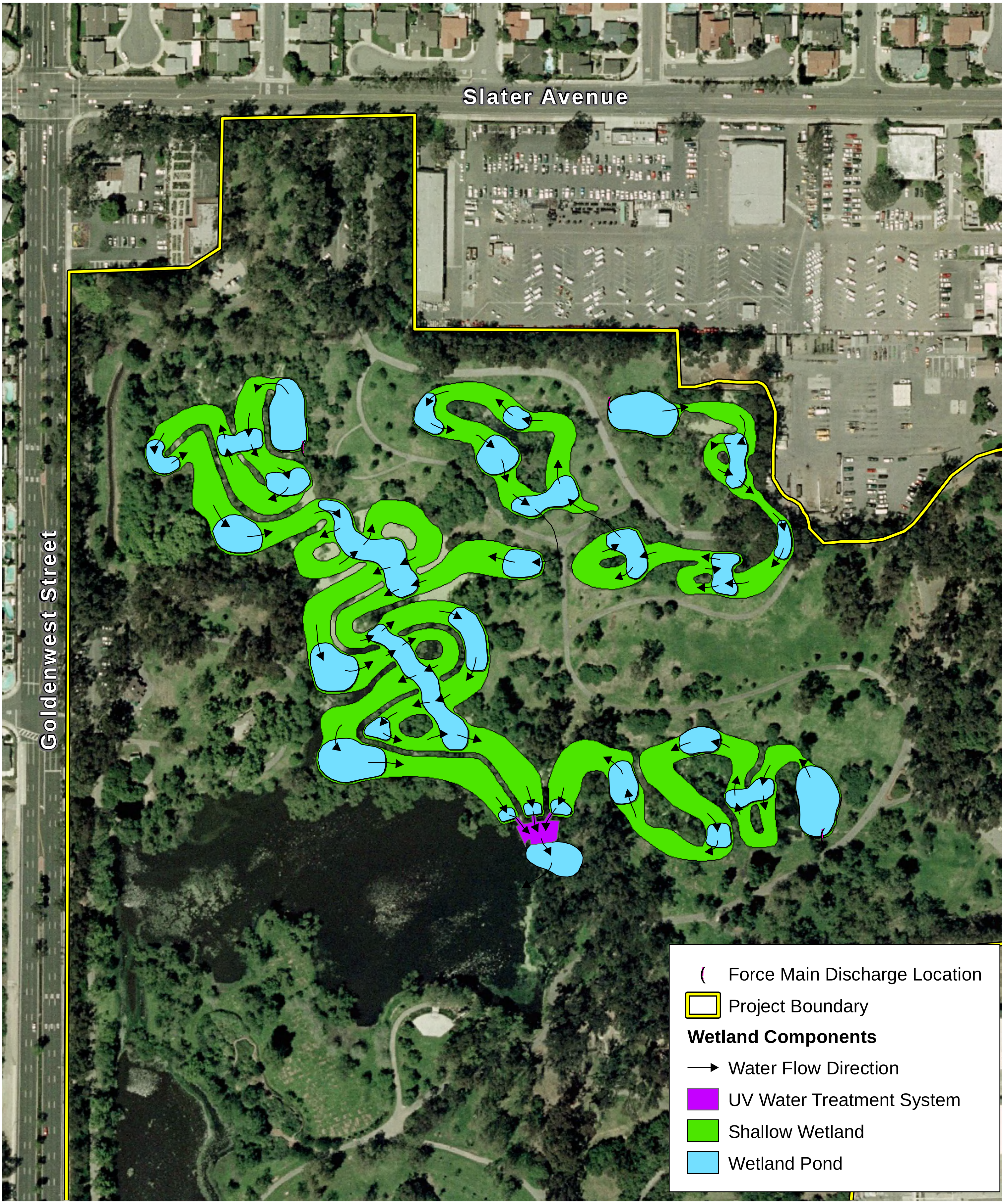

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Proposed Project Wetland Components, Central Park

Exhibit 7.4-11

Talbert Lake Diversion Project

2

250 125 0 250 Feet

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The first cell in each of the three wetland trains is designed with high density aeration pods at the flow inlet to deliver oxygen to the heavily concentrated inflow. An oxygen-rich environment would cause some metals and organophosphates (insecticides) to coagulate and create a dense particle capable of settling. Particles would descend by gravity and subsequently collect on the bottom of the basin. A soil-cement lined basin (forebay) with a maintenance entry would be designed into the upstream end of each wetland train to allow for periodic dredging of accumulated matter, if necessary, with the use of small equipment such as a backhoe loader. Remaining dissolved pollutant loads would then proceed to downstream areas for biological treatment.

Flows would proceed downstream into enhanced areas of shallow wetlands, which would be designed with dense plants to create low oxygen and high organic carbon environments. The shallow depth and densely vegetated nature of these wetlands would create an environment conducive to slow contaminant break down, which is not often removed by typical detention systems. Shallow wetlands provide an increase in biomass density and an ideal environment for denitrifying bacteria to flourish and process nitrate to nitrogen gas. The wet ponds would contain fixed-film products upon which biomass populations would grow, enhancing contact with pollutants. Mixing of the ponds would result in pollutant transfer efficiencies at a much higher rate than natural systems (Exhibit 7.4-12).

Once biomass in the system grows exponentially and begins to die off due to a lack of nutrients and oxygen, it will slough off into the water. Much of this biomass would fall to the bottom of the ponds where it would collect, digest (reduce content to carbon dioxide), and be used as a substrate for further treatment by organisms in the sediment. Any biomass that remains in suspension due to mixing would be transported through the wetland where it would be reduced by digestion, filtration by plants, and sedimentation.

Cattails and bulrush plant species have been proposed for these shallow wetland areas due to their ability to optimize these processes and support the hydraulic conditions needed for system functioning. Dense plantings allow an increase in turbulence within the system by creating obstacles throughout the flow path. Spacing these in uniform cross-sectional densities across the width of the wetland channel eliminates short circuiting. Wetland flow paths have been designed to include slightly deepened areas about every 100 feet. These deepened wetland pond areas (each about 40 feet in length) would span the width of the wetland channel to facilitate mixing conditions.

Flows from the 3 wetland trains then would encounter a larger deepened wet pond approximately 6 to 10 feet deep downstream of the 3 wetland trains. This pond would contain engineered treatment features designed for high-rate aerobic and anoxic biological nutrient removal processes. Flows would pass through mechanical coarse bubble mixing features and cross-flow dispersion nets, which would then spread outflows and provide sites for attached growth of beneficial biomass clusters for additional pollutant uptake. The sediment layer at the bottom of this pond would degrade, convert, and remove many dissolved organic constituents that remain in the diverted flows; some of these would include carbon, nitrogen, sulfur, and trace synthetic compounds (e.g., petroleum hydrocarbons and pesticides/herbicides).

In addition to the shallow, densely planted wetlands and deeper, open-water constructed wet ponds, two special pond cells have been incorporated into proposed project design at the downstream end of all three wetland trains. These ponds would provide final processing of flow from the wetlands before it enters Talbert Lake for polishing. The first pond would take advantage of ultraviolet (UV) disinfection processes available from natural sunlight and would consist of a concrete slab to prevent plant growth and enable colonization of autotrophic algae. The resultant microenvironment would enhance degradation of residual synthetic compounds such as agricultural and pharmaceutical products. The second specially designed cell would act as a polishing cell to remove phosphorus, heavy metals, and turbidity.

7.4.4 TALBERT LAKE

Final Talbert Lake restoration is expected to occur one to three years after construction of the channel diversion and treatment wetlands portion of the project. System performance for water quality purposes would be primarily achieved through the treatment processes within the wetlands project component; Talbert Lake restoration would serve as a final polishing step for water quality improvement and habitat enhancement. In the period between completion of the channel diversion and wetlands portions of the proposed project, Talbert Lake would function in its existing configuration with minor modifications proposed to support riparian habitat creation and weir modification. This condition is herein referred to as the “Talbert Lake Interim Condition” or the “Interim Condition.” The fully restored Talbert Lake after project construction is herein referred to as the “Talbert Lake Ultimate Condition” or the “Ultimate Condition.”

Talbert Lake Interim Condition

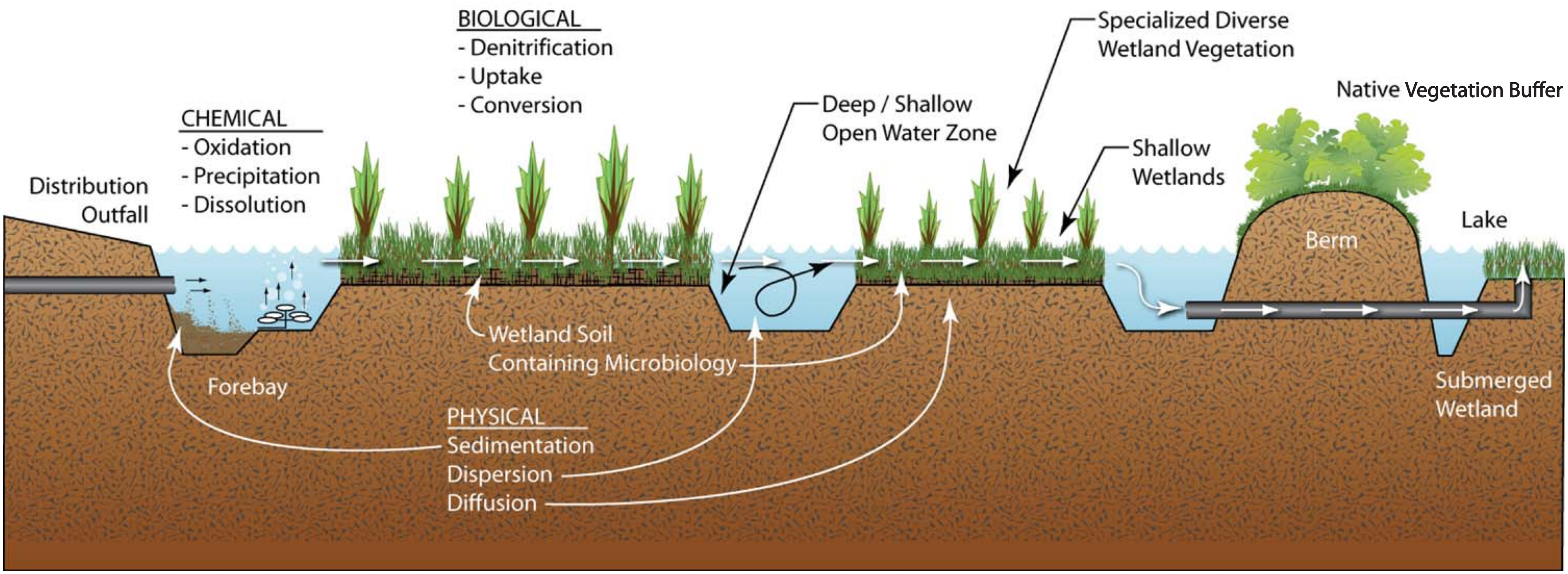
During the Interim Condition, all diverted flows from the adjacent wetland treatment system would be collected in a final treatment pond and discharged via gravity flow through a pipe system to Talbert Lake. This flow is expected to result in a permanent body of water within the lake area due to this constant inflow from the wetland treatment system. The northern portion of the existing lake would be re-contoured and raised above the lake water surface elevation in order to create an environment suitable for riparian habitat (Exhibit 7.4-13). Other than this location, the configuration of the lake would remain similar to existing conditions. The surface area of the lake during the Interim Condition would be about 7.3 acres and lake water surface elevation would vary from -2 (NAVD 88) to about -3 (NAVD 88). The bottom contours of the lake would not be adjusted during the Interim Condition and the depth would remain relatively shallow at about 1 to 3 feet in the majority of the lake, and up to 5 or 6 feet in the deepest parts of the lake.

Talbert Lake Ultimate Condition

Ultimate Talbert Lake restoration would consist of a complete reconstruction of the existing lake to create a deeper, permanent body of water with features to continually provide final polishing of flows in the system and to enhance wildlife habitat and recreational opportunities in Central Park (Exhibit 7.4-14). The post-project surface area of the lake and wetland at normal operating level would be approximately 7.3 acres, and the normal operating level of the lake would vary from -1 (NAVD 88) to about -3 (NAVD 88). Flows from the adjacent final wetland treatment pond would then be discharged directly into the lake.

During storm events, outflow from the restored Talbert Lake would discharge via the overflow weir to a 54-inch RCP that transitions to an 84-inch RCP under Goldenwest Street. The 84-inch RCP would outlet into Talbert Channel west of Goldenwest Street. As a Standard Condition of Approval, all BMPs would be built into the project consistent with National Pollutant Discharge Elimination System (NPDES) requirements. The system will be designed to infiltrate, evaporate, or use all treated flows as a source of irrigation water.

SC-2 Best Management Practices (BMPs) consistent with National Pollutant Discharge Elimination System (NPDES) requirements will be developed during final project design and will be approved by the City of Huntington Beach.



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Source: Pacific Advanced Civil Engineering, Inc. 2007

Wetland Design Concept

Exhibit 7.4-12

Talbert Lake Diversion Project

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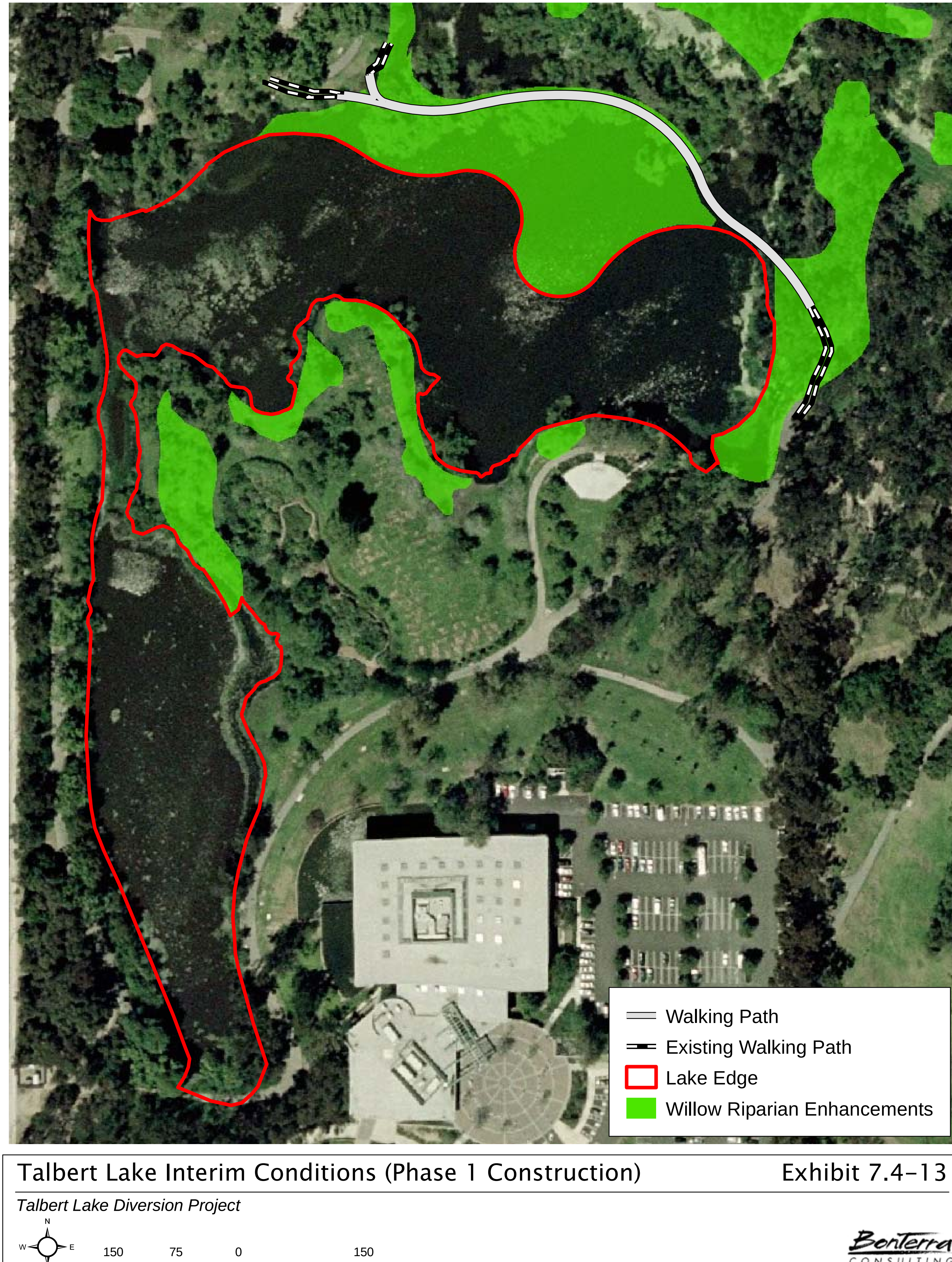

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Talbert Lake Interim Conditions (Phase 1 Construction)

Exhibit 7.4-13

Talbert Lake Diversion Project

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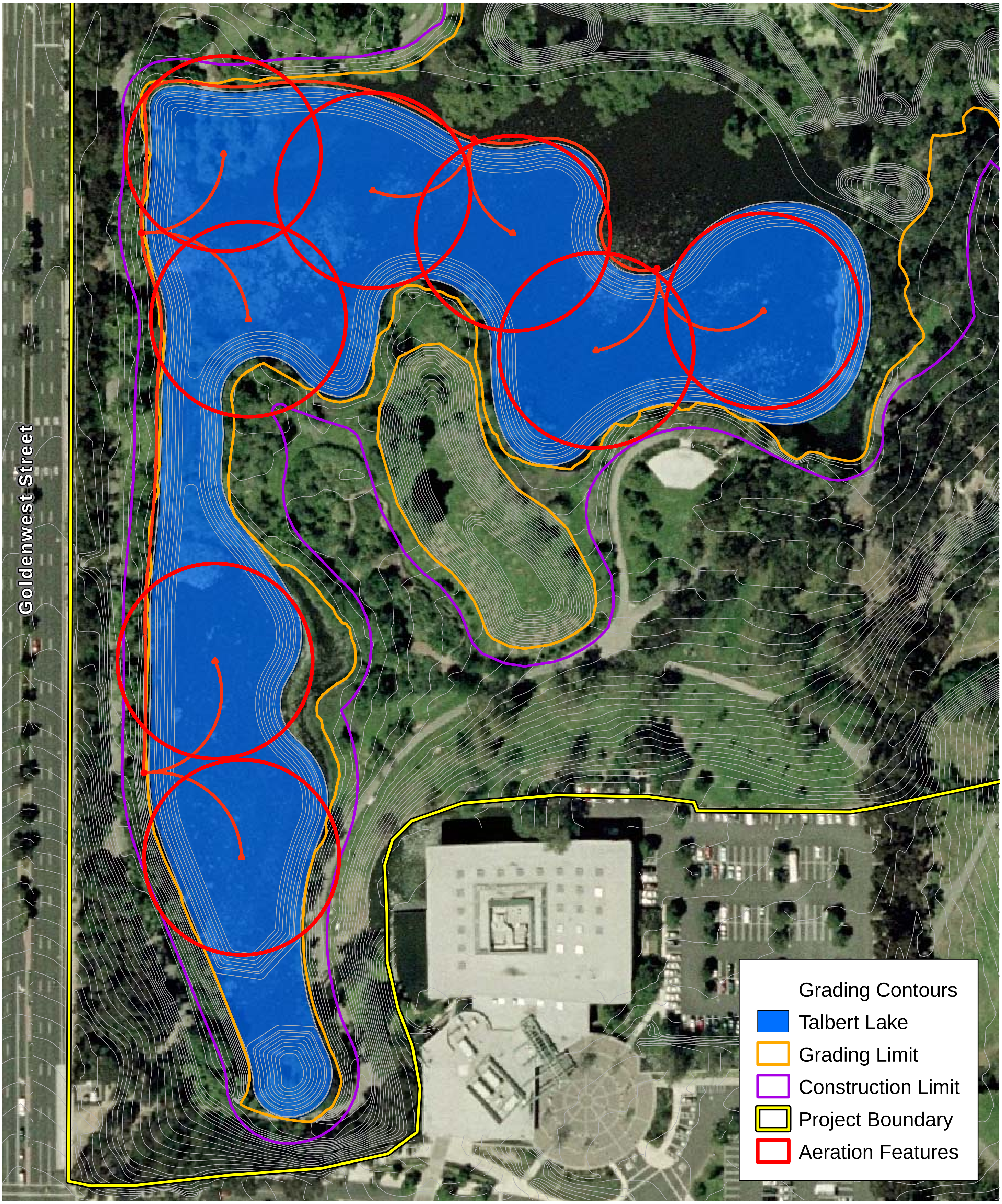

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Talbert Lake Features - Ultimate Condition

Exhibit 7.4-14

Talbert Lake Diversion Project

N W E S

150 75 0 150 Feet

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Lake Geometry

Average operating water depth is a key design parameter for Talbert Lake, as depth is correlated closely with water temperature and biological reaction times. An average operating depth of eight feet would (1) eliminate light penetration; (2) maintain lower average temperatures; (3) allow temperature stratification; and (4) minimize evaporation.

The lake would be completely reconstructed through deepening, shoreline reconstruction, and construction of lake water quality treatment systems in order to continually treat the lake's water. Lake deepening would be accomplished by excavating the lake bed to create a water depth of eight to ten feet. Bottom slopes would be designed at 4:1 (horizontal:vertical) to ensure that slopes are stable and to limit maximum water depth. Permanent lake surface area would be approximately 7.3 acres.

Lake Surface Elevation

Under dry weather conditions, lake surface elevation would be maintained with minor variation through the intake of diverted flows from the EGGWC and the withdrawal of this flow volume for park irrigation, evaporation, and groundwater infiltration. During wet weather conditions, the lake would be utilized for temporary storage of rainfall runoff, which would cause significant rises in water surface elevation following large storms. The stored rainfall runoff would be released downstream into the Talbert Channel over several days, and the lake would return to normal operating water surface elevation. The lake's outlet weir elevation into Talbert Channel would be decreased from 0 feet mean sea level (msl) to -2 feet msl to evacuate these higher flows under the Talbert Lake Ultimate Condition.

Lake Circulation Features

The lake would incorporate several types of features designed to continually treat and improve the water quality. These systems would include aeration, biofilters, vegetation, circulation, and pretreatment wetlands. Aeration for Talbert Lake would be provided by means of a fine bubble diffusion system placed on the lake bottom, which would eliminate temperature and density differences within the water column through vertical mixing. Oxidized conditions created through this mixing would provide enhanced conditions for lake biology and would create a condition where specific metals are less toxic and less bio-available. Oxidized conditions within the lake column are important for aesthetic reasons as these conditions reduce sulfur and methane production and help to maintain water color and clarity.

Biofilters that provide attachment sites for activated biomass used for nutrient removal would be placed at points located in all areas of the lake to support circulation of water and enhanced treatment. These biofilters would consist of gravel beds constructed within shallow portions of the lake (typically 3 to 4 feet deep) and would serve to clean the circulated lake water.

Water circulation throughout the lake would improve overall water quality by eliminating stagnant areas and by moving water through biofilters. Circulation would be provided by a new pump station that would be constructed adjacent to the lake, near the location of the existing irrigation pond.

The circulation pumps would move water from a single intake point into biofilters located near shore in all areas of the lake. This would ensure that all areas of the lake receive pumped flows of water, eliminating stagnation and allowing all portions to contribute to nutrient uptake and other pollutant-removal processes.

Project Vegetation and Habitats

The lake would be designed to support both emergent and submerged aquatic vegetation in order to enhance water quality, support wildlife, and improve lake aesthetics. Portions of the shoreline would support emergent vegetation similar to the vegetation in the treatment wetlands. Deeper areas of water would support aquatic vegetation of various types. All of this vegetation would have an active role in the nutrient uptake. Specific placement of vegetation around the lake's perimeter and selection of suitable native species would improve the appearance, support wildlife values, and create wildlife viewing opportunities within and around the lake. All areas designed to support vegetation would have water depths greater than six inches in order to allow small fish to access the base of the vegetation and eliminate mosquito larvae from taking refuge there.

Pretreatment Wetland for Storm Flow

Storm water enters Talbert Lake at four locations around Central Park. The majority of the storm water enters Talbert Lake 500 feet west of Gothard Street and 300 feet north of the Standard Oil property. The second inflow location is adjacent to Slater Avenue, where runoff from the watershed north of Talbert Lake is conveyed through a grass swale and 18-inch RCP along the northwestern corner of the park. This swale and 18-inch RCP have a limited capacity due to the flat gradient and storm water often overflows from the swale into the lake during high flows. The third inflow location is at the southwestern corner of the park near the intersection of Talbert Avenue and Goldenwest Street. Storm water runoff from the Huntington Beach Sports Complex is conveyed through a catch basin and RCP into the southwestern corner of Talbert Lake (Exhibit 7.2-6).

A pretreatment wetland would be constructed at the location where storm water from the sports complex parking lot enters a catch basin on Talbert Avenue and would flow directly into the lake. Water from this storm drain would pass through a pretreatment wetland before entering the lake, where flows would encounter bacteria, plants, and algae that capture nutrients and degraded organic material, while sediments are trapped by adhesion or settling. This pretreatment wetland would be sized to provide 24-hour detention for the anticipated dry-weather flow from this storm drain.

This pretreatment wetland would improve water quality prior to discharge into Talbert Lake by reducing sediment loads; settling out particulate phosphorous and metals; denitrifying and filtering; and biologically removing pesticides and hydrocarbons. As the only sediment that would enter this pretreatment wetland would be derived from a developed area, maintenance would be required very infrequently.

Lake Shorelines

Talbert Lake would have a constructed lake edge designed to prevent shoreline erosion; enhance safety for visitors; and provide an attractive appearance. Various shoreline designs would be used, but all would be similar to each other. Each design would incorporate durable material such as concrete veneer or grouted rock beneath the finished surface. The finished surface of the constructed lake edge may include an eroded concrete finish, a wetland planter shelf shoreline, grass shoreline, or natural shoreline. Areas along the lake's edge designated for concentrated public use would be constructed with hardened shorelines designed to resist erosion yet provide a natural appearance. Other portions of the lake's shoreline would be designated for riparian growth and would consist of native soils.

These engineered lake shorelines would: (1) limit erosion; (2) support public Americans With Disabilities Act (ADA) access where desired; (3) provide for vegetation growth in designated areas; and (4) provide a safe environment for park visitors. Lake edges would be designed to meet industry standards for public safety and would limit conditions conducive to the growth of mosquito larvae. These design features would include:

- A steep shoreline extending from approximately 6 to 12 inches below waterline to approximately 6 inches above waterline at a slope of approximately 1.5:1 (horizontal: vertical), to eliminate water shallower than 6 to 12 inches;
- Side slopes above water level of no more than 3:1;
- Water depth at the lake edge no deeper than 18 inches;
- A bottom slope of 4:1 (horizontal:vertical) until water depth exceeds 4 feet.

These conditions would provide a safe edge condition that provides for shallow water at the lake edge and easy egress for anyone who accidentally enters the water. As the lake is proposed to function as the water supply for park irrigation, the small concrete pond that currently serves this purpose adjacent to the overflow weir to Talbert Channel would be removed.

7.4.5 VECTOR CONTROL/FISH POPULATIONS

As a project design feature (PDF-2), Talbert Lake would be stocked with several species of small fish including mosquitofish (*Gambusia affinis*). These small fish inhabit very shallow water and are efficient predators of mosquito larvae. Wetland treatment areas have also been designed to support ease of access for any required vector-control activities (PDF-3). Other species of small fish would be introduced to support birds such as wading birds, kingfishers, and ducks. Larger fish (including largemouth bass) would be stocked as the top predatory fish in the lake to control the population of smaller fish and to help prevent invasion by undesirable fish that might be introduced. Large fish could potentially support recreational fishing activities if desired.

PDF-2 The restored Talbert Lake will be stocked with mosquitofish (*Gambusio affinis*) in order to control mosquito populations under post-project conditions.

PDF-3 Access points will be established for vector-control activities at the upstream end of each wetland train.

7.4.6 RIPARIAN HABITATS

Project design includes the establishment/restoration of willow riparian scrub habitat acreage equal to the acreage impacted by implementation of the proposed project (PDF-4). This habitat would be created in the initial phase of construction (Phase 1) with channel diversion and wetland project features. Currently estimated at 7.96 acres, this restored habitat would be located at slightly higher elevations adjacent to the wetland treatment ponds, shallow wetlands, and Talbert Lake (Exhibit 7.1-3). This effort would include both habitat creation within temporary project impact areas as well as habitat enhancement efforts in preserved riparian habitat areas. It would serve, along with the establishment of the open water and emergent treatment wetland components described above, as compensation for project impacts to USACE and CDFG jurisdictional areas.

The goal of the willow riparian scrub creation and enhancement component is to replace the biotic, hydrological, and physical functions that would be impacted by project construction. Specific goals for replacing these functions include:

- The establishment of habitat for wildlife species, including least Bell's vireo, by establishing self-sustainable riparian plant species that provide the appropriate cover, species diversity, age/size structure and structural diversity for nesting, foraging, and shelter purposes;
- The establishment of vegetation that, with time and maturation, would provide organic matter such as deadwood and rough and fine woody debris and detritus;
- The creation and enhancement of the hydrological functions provided by riparian scrub habitat including the slowing of surface flows, sediment trapping, and erosive force dissipation; and
- The creation of macro- and micro-topographical features such as mounding, depression, swales, and other features during initial site-preparation activities.

A discussion of these anticipated site conditions within both enhanced and created areas is provided below. A detailed Habitat Restoration Plan would be developed in compliance with USACE and CDFG requirements and other project documentation (PDF-5).

The willow scrub creation and enhancement areas would provide the structural, age, and species diversity required for foraging, nesting, and shelter purposes for wildlife species typical of Central Park and surrounding areas. General habitat structure and stratification would include the establishment of a mosaic of tree canopy areas interspersed with patches of herbaceous species and lower-growing shrub. This spatial distribution and structure is used by species such as the least Bell's vireo for foraging and nesting purposes. Plant species and structural diversity would be achieved by establishing the proposed riparian plant species (as discussed in Section 7.4.8) as well as additional plant species identified during reference site surveys performed as part of detailed Habitat Restoration Plan development. It is anticipated that native species recruitment would also contribute to plant species diversity and coverage as created and enhanced habitat areas develop. Plant species establishment would consist of a combination of seed mix application, container planting, and native species salvage. Seeds and container species would be obtained from on-site plant sources and other local plant sources within 30 miles of the project site and should be obtained from areas that have habitat conditions similar to Central Park. The use of on-site/local seed and container species sources as well as salvaged plant materials would maintain on-site genetic continuity and would facilitate the establishment of plant species that are adapted to local- and site-specific conditions at Central Park.

Deposition and buildup of organic materials (such as woody debris, leaf litter, and deadwood materials) would increase over time as plant species mature. These materials would provide a variety of habitat opportunities for invertebrates, small mammals, bird species, amphibians, and reptiles by providing food and forage materials, nesting and shelter opportunities, and nest-building materials. These materials also improve soil conditions by increasing organic content and by allowing for increased nutrient, water, and air movement and exchange, as well as improved root development. Short- and long-term site maintenance guidelines for the created and enhanced riparian scrub areas would emphasize the retention of deadwood and organic debris where possible and would be compatible with overall treatment wetland performance.

It is anticipated that the establishment of riparian scrub species and initial grading activities would ultimately result in the development of hydrological functions typical of riparian scrub habitats. These functions would include sediment trapping, slowing of surface flows, soil stabilization and overall erosive force dissipation, and would contribute to the overall water quality treatment functions of the adjacent created wetlands and pond areas.

As noted above, a detailed Habitat Restoration Plan would be developed in compliance with USACE and CDFG requirements, and would provide detailed guidelines for the development, establishment, and maintenance of the functions and values described above. Specifically, these plans would include: (1) guidelines for site grading and soils preparation, non-native species control, and temporary irrigation installation; (2) final planting palettes, planting quantities and sizes/types (e.g., container, transplant, cuttings), typical plant species spatial distribution and layout, and planting methodologies; (3) seed mix palette, quantities, and layout; (4) long-term maintenance guidelines including weed control, supplemental irrigation frequency and quantities, supplemental planting/seeding, pest control, vegetation and debris management, and protection of biological resources; and (5) long-term monitoring guidelines including regular evaluations of plant growth and site conditions, success criteria, and documentation of site conditions. The guidelines for site preparation, plant establishment, and long-term success criteria presented in the detailed Habitat Restoration Plan would be based on reference site surveys performed in suitable habitat areas (on site or in nearby high quality riparian scrub habitat). Reference site surveys would provide data that would be used to determine appropriate micro- and macro-topographic variability in final grading plans; plant species diversity, planting quantities, planting sizes, plant coverage and densities, and spatial distribution to be incorporated into final planting plans; and plant establishment and hydrological goals to be used as restoration success criteria during the long-term monitoring program. If appropriate, reference site surveys would be performed in riparian habitat that supports least Bell's vireo.

PDF-4 All impacted riparian acreage on site will be replaced and restored to a 1:1 ratio as a project feature. These restored riparian habitats will be monitored and maintained for a five-year period in order to ensure long-term success.

PDF-5 A Restoration Plan will be developed by the City providing detailed specifications for restored riparian habitats on site prior to initiation of construction. This Restoration Plan will include maintenance requirements.

7.4.7 AESTHETIC ELEMENTS

Aesthetic improvements in the form of native vegetation have been incorporated into the proposed project design and would be implemented in Phase 2 of Talbert Lake project construction. Additional conceptual water features at several locations within the park to dramatically improve park aesthetics could be added at a later date, if desired. The locations for these features are shown in Exhibit 7.4-15.

<u>Aesthetic Project Features</u>

Recirculating Stream

A recirculating stream is proposed in the earthen swale that flows around the northwestern corner of the park which currently is either dry or contains relatively stagnant, poor quality urban runoff. Natural features (such as cobblestones and rock) could be added to the creek bed, and some vegetation placed along the banks to improve the swale aesthetically while not significantly reducing the capacity. No re-grading is proposed.

Cascading Stream at Library

A water feature is proposed near the restored Talbert Lake in the form of a cascading stream that would flow from the Library into the lake.

Topographic Hill Near Talbert Lake

A new topographic feature consisting of a small knoll approximately 1 acre in surface area and 20 feet in height is proposed for an area immediately adjacent to the southeastern corner of the restored Talbert Lake, as a component of final Talbert Lake restoration (Exhibit 7.4-15). This feature would serve to provide a convenient on-site disposal area for material excavated from Talbert Lake and as an overlook amenity for the restored lake and wetlands area. This hill would be vegetated with turf grass in order to afford views of the park and to incorporate outdoor entertainment venues.

7.4.8 PRELIMINARY LANDSCAPING PLAN AND PLANT PALETTE

The upland borders of Talbert Lake and the new treatment wetlands would be planted with a wide variety of native plants that would enhance water treatment processes, support beneficial wildlife, enhance aesthetics, and function as a restored riparian and wetland ecosystem on the site. A detailed planting plan showing locations for all planting would be prepared prior to construction.

The vegetation communities to be established include emergent treatment wetlands, wet pond BMPs, lake margins, riparian scrub, and upland slopes. The dominant species listed in Table 7.4-1 below are those that (1) comprise the majority of the vegetation; (2) are typically the largest, most vigorous species; and (3) are long-living, permanent members of the community. Also present in each community would be numerous subdominant species. These species grow below or among the dominant plants and add to the ecology and beauty of the community. Subdominant plants would be identified separately, and the list of subdominant plants will grow and change as design proceeds. In many cases, subdominant plants are not planted at the same time as the dominant species, but are planted later when dominant species have become established to provide shade, stabilize soil, or otherwise create the microhabitat where the subdominant species can thrive (Table 7.4-2). Others can be planted at the same time as dominants if locations are carefully chosen. Many subdominant plants spread in or around larger dominant plants, but usually do not form the bulk of the vegetation in any location.

Emergent Treatment Wetlands

Emergent treatment wetlands would occupy large portions of the project site. These wetlands would serve as one of the primary sites for water treatment, and vegetation is an important part of the treatment process. Treatment wetlands would be continuously flooded with water depths of approximately one to three feet and would be relatively high in nutrients. Cattails (*Typha* spp.) and California bulrush (*Scirpus californicus*) are the dominant species within this community, and may be planted at a 2:1 ratio (cattails: bulrush). The design goal is the establishment of several plant species in highly visible and specific areas of the park shortly after the completion of construction.

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Project Aesthetic Features

Exhibit 7.4-15

Talbert Lake Diversion Project

BonTerra CONSULTING

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TABLE 7.4-1
DOMINANT PLANT SPECIES FOR TREATMENT WETLANDS*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Max. Water Depth (ft)
Baltic rush	*Juncus balticus*	2.50	1.00	1.00
three-corner rush	*Scirpus americana*	3.00	1.00	1.00
giant bulrush	*Scirpus californicus*	8.00	0.25	3.00
cattail	*Typha dominguensis*	5.00	N/A (self-sows)	3.00

sf = square feet
ft = foot/feet
*subject to change

Source: BonTerra Consulting 2007a.

TABLE 7.4-2
SUBDOMINANT PLANT SPECIES FOR TREATMENT WETLANDS*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Max. Water Depth (ft)
yerba mansa	*Anemopsis Californicus*	2.0	1.0	1.0
sedges	*Carex* spp.	Varies, to 3.0 ft	1.0	0.5
spike rush	*Eleocharis* spp.	2	1.0	1.0

sf = square feet
ft = foot/feet
*subject to change

Source: BonTerra Consulting 2007a.

Wetland Ponds

The ponds located within the wetland treatment trains would contain areas of open water and significant shallow margins that would support vegetation similar to those in Tables 7.4-1 and 7.4-2. All species listed above for wetlands would also be planted in the wetland ponds, but the mix of species may differ slightly as the ponds contain open water areas suitable for the establishment of a variety of aquatic vegetation. This aquatic vegetation is expected to establish on its own (i.e., it would not require planting).

Talbert Lake

Talbert Lake would include: (1) deep water areas that support little plant growth; (2) shallow water to support aquatic vegetation; and (3) margins that support emergent growth similar to treatment wetlands. The list of plant species in Tables 7.4-3 and 7.4-4 apply to emergent wetlands around the lake's perimeter and portions of the lake margins. These species are similar to those proposed for the wetland ponds and treatment wetlands, but also include additional ornamental species appropriate for public access areas.

TABLE 7.4-3
DOMINANT PLANT SPECIES FOR TALBERT LAKE MARGINS*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Max. Water Depth (ft)
Baltic rush	*Juncus balticus*	2.50	1.00	1.00
three-corner rush	*Scirpus americana*	3.00	1.00	1.00
giant bulrush	*Scirpus californicus*	8.00	0.25	3.00
cattail	*Typha dominguensis*	5.00	N/A (self-sows)	3.00

sf = square feet
ft = foot/feet
*subject to change

Source: BonTerra Consulting 2007a.

TABLE 7.4-4
SUBDOMINANT SPECIES FOR TALBERT LAKE MARGINS*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Max. Water Depth (ft)
yerba mansa	*Anemopsis californicus*	2.0	1.0	1.0
sedges	*Carex* spp.	Varies, to 3.0 ft	1.0	0.5
spike rush	*Eleocharis* spp.	2.0	1.0	1.0

sf = square feet
ft = foot/feet
*subject to change

Source: BonTerra Consulting 2007a.

Riparian Areas

Areas within the proposed project designated for riparian scrub restoration or creation would be located along the margins of the treatment wetlands, ponds, and their adjacent areas. Dominant plants would be established through transplantation of existing mature vegetation within the project's disturbance area and through other means, as described above in Section 7.4.6. This community would be dominated by shrubs and trees, but many subdominant plants can also thrive in this location. The list of plant species in Tables 7.4-5 and 7.4-6 apply to riparian scrub. The list of suitable subdominant plants would grow as design proceeds.

TABLE 7.4-5
DOMINANT PLANT SPECIES FOR RIPARIAN SCRUB*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Notes
mule fat	*Baccharis salicifolia*	10.0	0.1	Common at site.
narrowleaf willow	*Salix exigua*	20.0	0.1	Could be grown from cuttings of plants already on the site.
arroyo willow	*Salix lasiolepis*	10.0	0.1	See above
cattail	*Typha domingensis*	5.0	N/A[a] (self-sows)	Wetter areas.
golden currant	*Ribes aureum*	6.0	0.1	Versatile plant.
California rose	*Rosa californica*	5.0	0.2	Forms a dense thorny hedge.
western cottonwood	*Populus fremontii*	80.0	N/A[b]	Could be grown from cuttings of plants present on site.
coast live oak	*Quercus agrifolia*	80.0	N/A[b]	Drier areas near water.
western sycamore	*Platanus racemosa*	80.0	N/A[b]	Adaptable.

sf = square feet
ft = foot/feet
*subject to change
[a] self-sows
[b] density doesn't apply to these tree species

Source: BonTerra Consulting 2007a.

TABLE 7.4-6
ADDITIONAL PLANTS SPECIES FOR RIPARIAN SCRUB*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Max. Water Depth (ft)
yerba mansa	*Anemopsis californicus*	2.0	1.0	1.0
sedges	*Carex* spp.	Varies, to 3.0 ft	1.0	0.5
scarlet monkeyflower	*Mimulus cardinalis*	3.0	1.0	Self-seeds

sf = square feet
ft = foot/feet
*subject to change

Source: BonTerra Consulting 2007a.

Upland Slopes

Upland areas currently exist on the dry slopes adjacent to wetlands and ponds. These areas can support vegetation typical of oak woodlands, coastal sage scrub, or chaparral depending on the amount of moisture and sunlight. Tables 7.4-7 and 7.4-8 illustrate suitable plant species proposed for these areas and would vary depending on the amount of irrigation, shade, nearby vegetation, and soils.

TABLE 7.4-7
DOMINANT PLANT SPECIES FOR UPLAND SLOPES*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Notes
lemonadeberry	*Rhus integrifolia*	8.0	0.1	Common on coastal bluffs.
laurel sumac	*Rhus laurina*	15.0	0.1	Evergreen shrub.
black sage	*Salvia mellifera*	5.0	0.1	Flowering shrub.
California buckwheat	*Eriogonum fasciculatum*	3.0	0.1	Common on dry slopes.
mule fat	*Baccharis salicifolia*	10.0	0.1	Common at site.
coast live oak	*Quercus agrifolia*	80.0	N/A[a]	Drier areas near water.

sf = square
ft = foot/feet
*subject to change
[a] density does not apply to this tree species

Source: BonTerra Consulting 2007a.

TABLE 7.4-8
ADDITIONAL PLANT SPECIES FOR UPLAND SLOPES*

Common Name	Species Name	Height (ft)	Planting Density (plants per sf)	Notes
orange monkeyflower	*Mimulus aurantiacus*	2.0	1.0	
fuchsia-flowered currant	*Ribes speciosum*	6.0	0.2	Thorny. Showy flowers in winter

sf = square feet
ft = foot/feet
*subject to change

Source: BonTerra Consulting 2007a.

7.5 PROJECT CONSTRUCTION REQUIREMENTS

7.5.1 OVERVIEW/STAGING

All construction staging would occur from the parking lot at the northeastern corner of Central Park, which is located on Gothard Street about 700 feet south of the intersection of Gothard Street and Slater Avenue (Exhibit 7.5-1). Staging would consist of a construction trailer, employee parking, and earth-moving/construction-support equipment and would require the use of the entire parking lot, which would be closed to the public for the duration of construction. As this staging area is located immediately adjacent to the northern boundary of the project site in Central Park, construction equipment would directly access the site via the paved path adjacent to the parking lot without impact to local streets.

As a Standard Project Condition all construction will comply with SCAQMD regulations, including Rule 402 (the Nuisance Rule), and Rule 403 (Fugitive Dust).