ATTACHMENT B

River Oaks Pump Station Conceptual Design

DRAFT

River Oaks Pump Station Regional Stormwater Capture Concept

San José

Concept Description

The River Oaks Pump Station is located on a 5.5-acre parcel between the Guadalupe River and Riverview Parkway. The facility was constructed in 1979, consisting of a detention basin and a pump station housing three large pumps with a maximum discharge capacity of 67 cubic-feet-per-second (cfs). The pump station was retrofit with a trash rack in 2011. The 4-acre detention basin has a storage capacity of 9.83 ac-ft that provides offline storage to meet the flood control needs of the 100-year flood event. Stormwater runoff from the 344-acre drainage area enters the facility through an 84-inch storm drain pipe discharging directly into the 89,000-gallon wet well to the pump station. Each of the three pumps discharge into an outfall structure and then through a 42-inch pipe to the Guadalupe River. As inflows exceed the 67 cfs capacity of the pump station, the stormwater level rises within the wet well. Stormwater overflows a weir structure that discharges through an 84-inch drainage pipe into the detention basin. After storing excess runoff during the peak of the storm event, the detention basin returns flows to the pump station wet well via a perforated 24-inch french drain structure.

In 2014 Brown and Caldwell prepared a draft Regional Stormwater Facility Feasibility Study that evaluated different alternatives to modify the pump station configuration and operations in order to provide both hydromodification and water quality treatment. This project concept is based on the recommended alternative from that study.

This project will establish a new diversion structure inside the pump station and redirect flows into the detention basin at the beginning of a storm event (as opposed to solely providing flood control at the peak of a storm event). A vertical trash rack will be installed immediately downstream of the new diversion structure to remove trash and debris. Allowing the system to divert flows at the beginning of a storm provides hydromodification benefits by delaying the discharge from the pump station, and the proposed improvements result in an overall increase in flood storage capacity above the current 100-year standard.

With additional grading, planting, and soil amendments, the detention basin will be converted into a large bioretention facility. Bioretention soil will be added to the site to enable stormwater treatment, and additional grading will occur to create a forebay near the inlet. Changes to the profile of the basin must account for the existing flood control function of the facility as well as excavation constraints posed by the shallow depth to groundwater. A portion of the facility may be designed to accommodate dry weather flows, functioning more as a wetland, with the vast majority of the facility continuing to function as bioretention. An overflow structure will be added to the basin to redirect flows back to the pump station during large storm events. Following a storm, detained flows will drain back to baseline conditions within 24 hours.

Recreational use of the site, which is currently fenced off with no public access, will be activated by restoring the perimeter pathway around the basin and constructing an interior raised path or boardwalk that connects to the existing Guadalupe River Trail and the adjacent park along Riverview Parkway. These paths will provide access for maintenance of the treatment facilities.

Concept Metrics

WATERSHED CHARACTERISTICS

Watershed	**GUADALUPE RIVER**
Drainage Management Area	**344 AC**
% Impervious of DMA	**62**
Total Runoff Volume	**133 AC-FT/YR**

FACILITY INFORMATION

Bioretention

Total Facility Area	**135,000 SF**
Maximum Surface Ponding	**3.0 FT**

DESIGN CRITERIA

Total Storage Volume	**10 AC-FT**
Infiltration Rate	**2.0 IN/HR**
Total Runoff Captured	**120 AC-FT/YR (90%)**

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CONCEPT SITE DRAINAGE AREA

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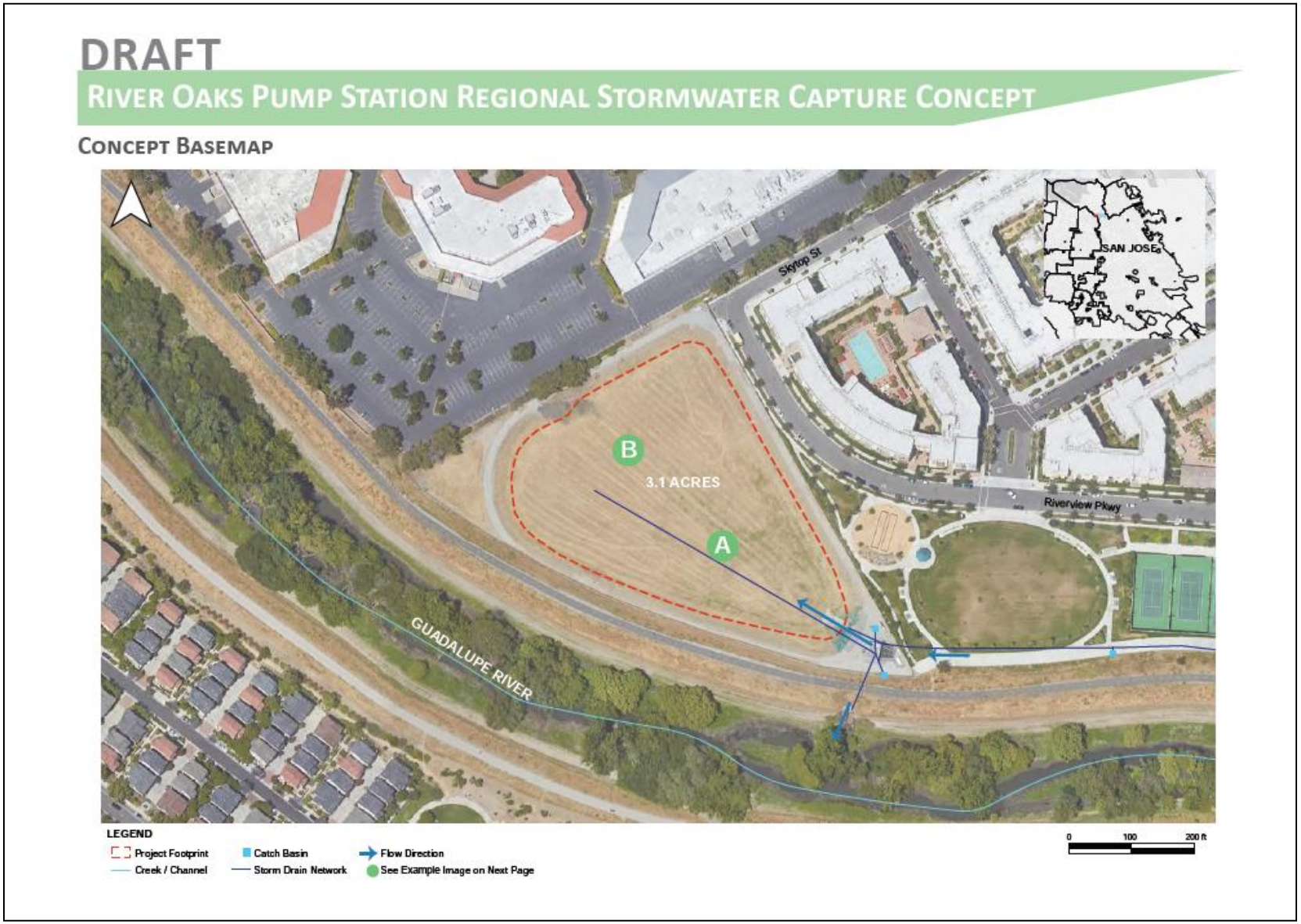

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Example of Regional Stormwater Treatment Integrated into Park Setting at Helms Park in Champaign, Illinois

Example of Regional Treatment Facility when Dry at Pacific Shores Center in Redwood City, California

Conceptual Rendering - River Oaks Pump Station Facing West

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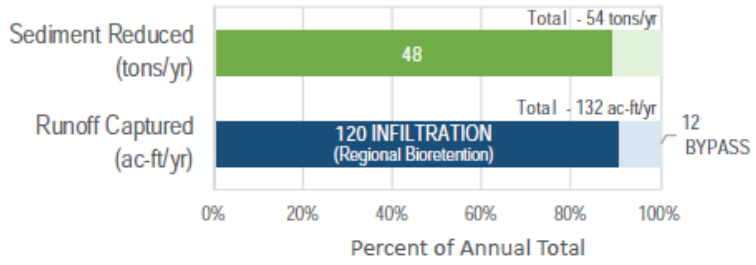
Budget-Level Cost Estimates

DESCRIPTION	UNIT COST	UNIT	QUANTITY	SUBTOTAL
Utilities Protection/Relocation	$20,000	LS	1	$20,000
Pump Station Modifications	$750,000	LS	1	$750,000
Excavation & Offhaul	$70	CY	13,800	$966,000
Bio-soil Media	$200	CY	3,800	$760,000
Surface Restoration & Planting	$8	SF	135,000	$1,080,000
Overflow Structure with Return Pipe	$150,000	EA	1	$150,000
Boardwalk (for Maintenance Access)	$1,200	LF	800	$960,000
			CONSTRUCTION SUBTOTAL	**$4,686,000**
Mobilization (10% construction)				$469,000
Contingency (30% Construction)				$1,406,000
Design (12% Total)				$787,000
			TOTAL PROJECT COST (DESIGN + CONSTRUCTION)	**$7,348,000**

- These are planning-level cost estimates ($2018) for design and construction. Soft costs for City administration and project management and post-construction operations and maintenance are not included. Other factors that may affect the cost of future construction include escalation and market conditions.
- The cost estimate for pump modifications in the 2014 Brown and Caldwell feasibility study was increased to account for inflation and additional considerations not identified in that report.

Concept Effectiveness (Annual Average)



- Effectiveness is defined as the modeled ability of the proposed project to capture stormwater runoff from the management area, remove the identified constituents from that stormwater, and infiltrate or reuse the captured water.
- Modeling and performance estimates are based on an historical rainfall time series from water year 2007 through water year 2015.

Additional Potential Benefits

- Flood Management
- Reestablishes Natural Hydrology
- Within Priority Development Area
- Community Enhancement

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Additional Considerations

This project concept is planning-level and subject to revision as additional information becomes available. Factors to be considered include but are not limited to the following:

- Community Enhancement. San José identified "place-making" as an important aspect of these regional stormwater projects, and this project has the opportunity to transform an inaccessible, fenced-off detention basin into a recreational amenity linked to the Guadalupe River trail.
- Infiltration Potential. The Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database lists soils within the detention basin as having an infiltration capacity of 1.98 to 5.95 inches-per-hour. A previous site investigation estimated the high seasonal groundwater level in the basin to be approximately 5 feet below ground level (Brown and Caldwell, 2014). Water may pond in the facility following a storm event, but will draw down after groundwater recedes and saturated soils drain to the river. A geotechnical investigation will be conducted to verify infiltration rates prior to design. Site-specific borings and infiltration tests will be performed during design development to ensure facilities are designed appropriately.
- Stormwater Diversion. The flood control function of the pump station and detention basin will be further analyzed to ensure that the integrated water quality function proposed by this project does not compromise flood control operations in any way.
- Stakeholder Coordination. In addition to community outreach to get input about public priorities and preferred improvements, the City and design team will stay closely coordinated with the Santa Clara Valley Water District on all matters related to flood control function, with the intent of enhancing capacity in the project area.