



## CHAPTER SIX: PUBLIC INFRASTRUCTURE AND SERVICES

### 6.1 INTRODUCTION

The construction of onsite and offsite infrastructure improvements will be required to accommodate proposed development within the Plan Area. The Plan is intended to provide infrastructure and services that meet City standards and integrate with existing and planned facilities and connections, without diminishing services to existing residents or businesses within the City.

This chapter provides an overview of the major utility infrastructure improvements and the public services needed to serve full build-out of the Plan Area. Utilities addressed include storm drainage (including grading), potable and non-potable water, wastewater, electricity, natural gas, telecommunications, wireless communications, and waste management. Services include police and fire protection. (Transportation and parking infrastructure requirements are addressed in Chapter 5.)

The major public “backbone” infrastructure improvements are planned to provide services to the entire Plan Area including both public purpose and private purpose development.

The existing utilities within the fair concourse area will remain in-place, but will be connected to new “backbone” infrastructure along Sage-Loop Connector Road (water, sewer, storm, electric, gas, phone, cable). In addition, new utility stubs to the fair parcels will be provided along North and South Loop Road. The new Exposition Hall, for example, can connect to new utility stubs at the intersection of North Loop Road and Entry Road and/or to existing utilities within the concourse. Improvements to existing utilities within the concourse area are not included with this plan.

Major objectives for infrastructure include:

- Develop practical cost effective solutions that can be constructed in phases.
- Provide flexible options that can adapt to market conditions.
- Implement solutions that minimize impacts to the environment and maximize sustainability.
- Details relating to phasing and financing are included in Chapter Seven: Implementation.

The information in this chapter is informed by the Plan’s conceptual site plans and may be subject to change as more detailed plans and specifications are developed as part of the design and development process.

### 6.2 STORM DRAINAGE AND GRADING

#### 6.2.1 Background and Existing Conditions

Vallejo Sanitation and Flood Control District (VSFCD) provides public stormwater and flood control protection services for the Plan Area. The City of Vallejo administers stormwater quality protection through the San Francisco Bay Region Municipal Regional Stormwater National Pollution Discharge Elimination System (NPDES) permit (the permit is generally referred to as the MRP).

The Plan Area is located within a 4,600+ acre watershed identified in the VSFCD master plan as the Lake Chabot watershed. Drainage systems from approximately 3,300 acres of the watershed converge on the Fairgrounds property and discharge into the “Fairgrounds Channel”. The channel

wraps around the eastern, southern and western periphery of the Plan Area as shown in Figure 6.1.

Approximately 62 of the 149± acres within the Plan Area are currently developed with impervious surfaces including buildings and paved parking lots. Approximately 33 additional acres are developed with a golf course and equestrian racetrack. The remaining 57 acres are generally undeveloped. Portions of the undeveloped land are utilized as unpaved parking facilities for fair events and for overflow parking from Six Flags Discovery Kingdom.

There are several components related to the existing drainage system within the Plan Area. Major components include four creeks (North, Central and South Rindler Creek and Blue Rock Springs), a manmade open channel (Fairgrounds Channel) and Lake Chabot. Other components include both public and private underground pipe systems. Public facilities are owned and maintained by the VSFC and are located both onsite and offsite. Private facilities are owned and maintained by the County / Fairgrounds Association and are generally located onsite. The private facilities are not well documented, but appear to discharge into public facilities.

An understanding of the historical creek systems is important as it relates to the drainage system and causes of flooding in the Plan Area. The existing public drainage facilities within the Plan Area revolve around the creek systems that collect water from the much larger watershed to the north, east and south of the site. The creeks are known as North Rindler Creek, Central Rindler Creek, South Rindler Creek and Blue Rock Springs. The creeks converge near the Plan Area and discharge into Fairgrounds Channel prior to discharging into Lake Chabot (see Figure 2.4: Existing Drainage Pattern and Figure 6.1: Stormwater Exhibit).

- North Rindler Creek has been diverted into an underground pipe system that crosses under SR-37 and discharges into Lake Chabot.
- Central Rindler Creek has been diverted into a combination of underground pipes, box culverts and manmade open channels. A pipe/culvert system crosses under I-80 near the north end of the existing racetrack and discharges into the Fairgrounds Channel (the channel flows south along the east property line; then flows west along the south property line; then flows north along the west property line and eventually crosses under Fairgrounds Drive and discharges into Lake Chabot).
- South Rindler Creek has been diverted into a combination of underground pipes, box culverts and manmade open channels. A pipe system crosses under I-80 near the south end of the racetrack and discharges into the Fairgrounds channel that connects to Lake Chabot as described above.
- Blue Rock Springs has been diverted into a combination of pipes, box culverts and manmade open channels. South of the Fairgrounds property it is an open channel that flows north through the Newell Mobile Home Park and discharges into the Fairgrounds Channel (near the middle of the southern Plan Area).

The Fairgrounds Channel is not capable of containing 100-year flood flows from the offsite creeks as identified in the VSFC Storm Drain Master Plan and illustrated on the FEMA flood map (Panel Number 06095C0440E). Flows overtop the banks and spill onto portions of the Fairgrounds property, Fairgrounds Drive, Coach Lane and into the Newell Mobile Home Park. Proposed improvements to alleviate flooding impacts within the Plan Area are described in Section 6.2.2 of this chapter.

### **6.2.2 Proposed Stormwater Collection and Conveyance**

In conjunction with the preparation of this Plan, VSFC was consulted to determine existing system operation, capacity and future infrastructure needs. VSFC reported that:



- Drainage improvements within the Plan Area should be based on hydrology and hydraulic calculations documented in the VSFC Master Plan. The Master Plan contains an analysis of the upstream watershed including estimates of the peak 100-year flow rates for North, Central and South Rindler Creek and Blue Rock Springs.
- Drainage improvements within the Plan Area should lower the maximum hydraulic grade line (HGL) to elevation 86.0 (NAVD88) at the confluence of Blue Rock Springs and the Fairgrounds Channel. Lowering the HGL to elevation 86.0 would be consistent with recommendations in the VSFC Master Plan and would help alleviate flooding along Coach Lane and within the Newell Mobile Home Park area.

The main drainage infrastructure improvements for the project are designed to remove the Plan Area from the flood plain. The site is currently in the flood plain due to high offsite flows from the east and south as described in Section 6.2.1. Newell Mobile Home Park to the south of the Plan Area also has flooding problems due in part to the existing channel conditions. It is therefore desirable to also improve the flood conditions for the mobile home park. Proposed floodplain improvements include placing fill material at the northern end of the Plan Area to raise the ground elevation and enlarging the existing Fairgrounds Channel to contain flood flows at the southern end of the Plan Area.

### **Fairgrounds Channel**

In order to remove the southern portion of the Plan Area (Phase 2) from the flood plain the existing Fairgrounds Channel will be widened and deepened, and the existing crossing will be improved under Fairgrounds Drive. The channel improvements will improve the flooding conditions for the mobile home park although additional improvements within the park may be required that will not be a part of this project (a separate VSFC Capital Improvement Project has been identified in the VSFC Master Plan for that work).

The proposed cross-section of Fairgrounds Channel includes an eight-foot wide, one-foot deep meandering low flow “notch”; a 40 to 50-foot wide, two-foot deep low flow channel section; and a 20 to 50-foot wide, five to seven-foot deep upper level bench. Side slopes are planned at a minimum of 3:1, but may be flattened to 4:1 where possible. Some slopes may be constructed at 2:1 if approved by VSFC. The overall depth of the channel varies from 5 to 15 feet. The channel ranges in overall width from 100± to 180± feet at the top of bank as shown on Figure 6.1. Refer to Chapter Four for design guidelines associated with the channel improvements.

As an option, particularly as it relates to Phase 1 development, the existing levee along the channel and adjacent to the racetrack may be utilized to protect portions of the Plan Area from flooding. In order for the levee to be taken into account in its “as-is” condition it would need to be able to be accredited / certified through the Army Corps of Engineers. As of the preparation of this Plan it is not known if the levee in its current “as-is” condition would meet the design standards. If the levee cannot meet the design standards it would need to be reconstructed. In any event, the levee would not be sufficient to remove the entire Plan Area from the floodplain and the above described improvements to Fairgrounds Channel would still be required. The levee in combination with channel improvements may also be considered as a viable solution, which could potentially avoid some jurisdictional wetland impacts, but at the same time would make the Plan Area a “levee protected community”.

The design of the Fairgrounds Channel should be closely coordinated with VSFC and other permitting agencies.

### **Creek Park and Water Feature**

Aside from the proposed channel improvements, the multi-purpose water feature within the Creek Park would be constructed onsite to manage and reduce peak discharges from the Plan

Area. It would effectively function as a recreational amenity providing a visual focus for the Creek Park and associated trails, a water quality Best Management Practice feature, a detention basin, and an irrigation source. The water feature would connect to an existing 84" underground pipe near the northwest corner of the Plan Area.

A primary objective of the water feature is to provide water quality benefits for the project and improve the water quality of site runoff before that water leaves the Plan Area and enters Lake Chabot. Some of the potential water quality measures that may be implemented include:

- Provide sufficient depth and volume of water to control temperature
- Construct a flow and depth control device where water leaves the onsite water feature and connects to a pipe that connects to Lake Chabot
- Line the water feature to avoid impacts associated with the existing high water table condition. The water feature should be designed to maintain a high quality of water and the liner should minimize any existing poor groundwater quality water from mixing with the water feature. In addition, the water feature should be designed to maintain a minimum depth of water and the liner should minimize fluctuations in water elevation due to changes in groundwater elevation.
- Construct sediment control systems
- Construct trash/debris collection systems
- Install aeration system in water feature
- Connect Plan Area irrigation systems to the water feature to circulate water
- Provide a make-up water system to maintain water volume due to evaporation losses

### **Other Improvements**

Additional water quality improvements would be constructed throughout the Plan Area such as biotreatment facilities in order to meet the MRP requirements.

Onsite drainage systems within the streets would be designed in accordance with City and VFSCD standards. Underground pipes would be designed to accommodate 15-year storm events. Surface flow in the streets would be designed to accommodate 100-year storm events by directing runoff toward the water feature or Fairgrounds Channel.

New stormwater pipelines would be constructed in each backbone roadway providing service to each parcel. Existing public pipelines that traverse the Plan Area would be relocated as necessary to avoid conflicts with development. Existing pipes with the Fair concourse will remain in use.

Refer to Figure 6.1: Stormwater Exhibit for drainage calculations.

### **6.2.3 Grading and Soil Conditions**

Preliminary geotechnical studies have determined that undocumented fills and soft compressible materials exist within the Plan Area. The "fill" is associated with the partial filling of Lake Chabot, which previously extended from its existing eastern bank to the west side of the existing Fairgrounds racetrack. The undocumented fill may require remedial grading and/or deep foundations. Additional geotechnical studies to determine the extent and condition of the fill and the required remediation should be required with future design phases of development.

Groundwater within the area is shallow; therefore, dewatering should be included in the construction process to allow for deep excavations.

The onsite water feature as described in Section 6.2.2 should be lined to avoid impacts associated





Figure 6.1: Stormwater Exhibit

with shallow groundwater.

#### 6.2.4 Sustainable Practices for Storm Drainage

The onsite water feature would serve to “harvest runoff” to be used onsite for irrigation. Harvesting and reuse is consistent with Low Impact Development (LID) practices as specified in the San Francisco Bay Region Municipal Regional Stormwater National Pollution Discharge Elimination System permit (MRP).

The MRP requires “regulated projects”, of which Solano360 qualifies, to implement at least one “site design and stormwater treatment requirement” from a specific list of options (MRP Provision C.3.c(i)(2)(a)). As an example, option (v), as specified is to “minimize stormwater runoff by implementing one or more of the following site design measures”:

- Direct roof runoff into cisterns or rain barrels for reuse.
- Direct roof runoff onto vegetated areas.
- Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
- Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct sidewalks, walkways, and/or patios with permeable surfaces.
- Construct driveways, bike lanes, and/or uncovered parking lots with permeable surfaces.

The Solano360 project would implement these measures to the extent practical and as required by the MRP. In particular the Solano360 onsite water feature would effectively function to harvest stormwater runoff for reuse similar to a cistern or rain barrel.

MRP Provision C.3.c(i)(1) requires “regulated projects” to implement “source control measures” as follows:

(a) Minimization of stormwater pollutants of concern in urban runoff through measures that may include plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency’s authority and standards:

- Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants.
- Dumpster drips from covered trash, food waste and compactor enclosures.
- Discharges from covered outdoor wash areas for vehicles, equipment, and accessories.
- Swimming pool water, if discharge to onsite vegetated areas is not a feasible option.
- Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option.

(b) Properly designed covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas;

(c) Properly designed trash storage areas;

(d) Landscaping that minimizes irrigation and runoff, promotes surface infiltration, minimizes the use of pesticides and fertilizers, and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping;

(e) Efficient irrigation systems; and

(f) Storm drain system stenciling or signage.



## 6.3 POTABLE AND NON-POTABLE WATER

### 6.3.1 Background and Existing Conditions

Public water service for the Plan Area is provided by the City of Vallejo and managed by the City of Vallejo Public Works Department – Water Division. Private systems located within the Fairgrounds property are owned, operated and maintained by the County. Under current conditions, adequate water service is provided. New construction in the Plan Area will result in increased demand for water service.

Existing public pipelines are located underneath Fairgrounds Drive, Sage Street and Coach Lane. There are two public water connections and meters to the site. The first is located at the north end of the site off of Sage Street. The second is located at the south end of the site off of Coach Lane. Private pipelines exist throughout the Fairgrounds property.

Two non-potable (raw) water systems exist within the vicinity of the Plan Area. One system is public and is owned, operated and maintained by the City of Vallejo. The pipeline is referred to by the City as the “Cal-Pac” line. The other system is privately operated and maintained by the County / Fairgrounds Association. The pipeline is referred to by the Fairgrounds Association as the “Lake Chabot” line.

The supply source for the Cal-Pac system is the North Bay Aqueduct (NBA). The NBA is also one of the City’s potable water supply sources. The Cal-Pac pipeline runs along the northern property line of the Fairgrounds site and currently delivers irrigation water to Blue Rock Springs golf course. The system has been utilized in the past to provide irrigation water to the Fairgrounds Joe Motara golf course and racetrack. A turnout in the system exists near the north end of the racetrack which could be utilized for future development on the Fairgrounds property.

The supply source for the Lake Chabot system is Lake Chabot itself and the tributary watershed area that drains to it. The Lake Chabot system currently provides water to the Joe Motara golf course through a lease agreement between the City of Vallejo and the Vallejo Golf Club.

The Lake Chabot pipeline extends from Lake Chabot to the Joe Motara golf course near the middle of the Fairgrounds property. A pump station is located on the southeast shore of Lake Chabot that delivers water into the pipeline.

### 6.3.2 Potable and Non-Potable Water Supply and Demand

The City of Vallejo will provide water to the site for domestic use, fire protection, irrigation purposes and make-up water for the onsite water feature. The total average water demand estimate for the Plan Area is approximately 97.7 million gallons per year including potable use, irrigation and evaporation losses from the water feature.

### 6.3.3 Water Treatment, Storage and Distribution

The City of Vallejo will provide treated water to the Plan Area. Non-potable sources may be available for irrigation and make-up water purposes. Depending on the non-potable water quality, it is possible that a chlorination and/or filtration system may be required.

A 12” public water pipe currently exists within Fairgrounds Drive. Public water connections also exist at the north end of the project off of Sage Street and at the southern end of the project off of Coach Lane.

Based on information provided by the City Water Division, development of the Plan Area may trigger the need for a new 24” pipeline in Fairgrounds Drive from Sage Street to Coach Lane. Water modeling should be required with future design stages of the development to determine if the new 24” pipe is required and when.



Water storage tanks exist throughout the City of Vallejo. Based on information provided by the City Water Division, development of the Plan Area is not expected to trigger the need for any additional storage.

New potable water and non-potable water pipelines should be constructed in each backbone roadway providing service to each parcel. The non-potable pipelines should be constructed in conformance with Title 22 recycled water standards (also sometimes referred to as “purple” pipe). Existing potable water pipelines with the Fair concourse area will remain in use.

#### **6.3.4 Sustainable Practices for Potable and Non-Potable Water**

Measures for water reduction, efficiency and conservation are recommended for development in the Plan Area as required by the California Green Building Code and recommended in the City of Vallejo’s Urban Water Management Plan. This Plan includes guidelines that are intended to incorporate water-conserving measures in the design of new development and infrastructure (see Chapter Four).

Harvesting and reusing stormwater for irrigation along with non-potable water sources are intended to be used throughout the Plan Area. A non-potable water system is planned within each backbone roadway. The non-potable system should be installed in accordance with Title 22 standards for recycled water use in the event recycled water becomes available.

The VSFCDD prepared a wastewater treatment and reclaimed water feasibility study in 2003. The study concluded that constructing a city-wide reclaimed water system was not economically feasible. However, the VSFCDD has long term goals of implementing such as system sometime in the future. Benefits of the system include a reduction in potable water demand as well as reducing water quality impacts on the Bay associated with wastewater discharge.

### **6.4 WASTEWATER**

#### **6.4.1 Background and Existing Conditions**

The wastewater conveyance and treatment system for the Plan Area is owned, operated and maintained by the VSFCDD. Public conveyance pipelines are located within public right-of-way or easements. Private systems are located within the Fairgrounds property and are operated and maintained by the County / Fairgrounds Association.

The VSFCDD treatment plant is permitted to treat up to 15 million gallons per day (mgd), but is currently only treating approximately 9 mgd. Based on discussions with the District Engineer there is sufficient capacity to treat wastewater generated by future development within the Plan Area.

Based on discussions with the District Engineer it is not likely that any offsite improvements will be required to convey wastewater to the treatment plant. The VSFCDD system model should be updated to verify pipeline capacity is sufficient during the design stage of the infrastructure.

#### **6.4.2 Wastewater Generation & Treatment**

The total average wastewater generation estimate for the Plan Area is approximately 53.0 million gallons per year (0.15 mgd).

VSFCDD has adequate treatment capacity to accommodate development of the Plan Area.

#### **6.4.3 Wastewater Collection and Conveyance**

New wastewater pipelines should be constructed under each backbone roadway providing service to each parcel. New facilities located within the public right-of-way or within public easements should be owned and operated by VSFCDD. Existing public pipelines that traverse the Plan Area should be relocated as necessary to avoid conflicts with development.







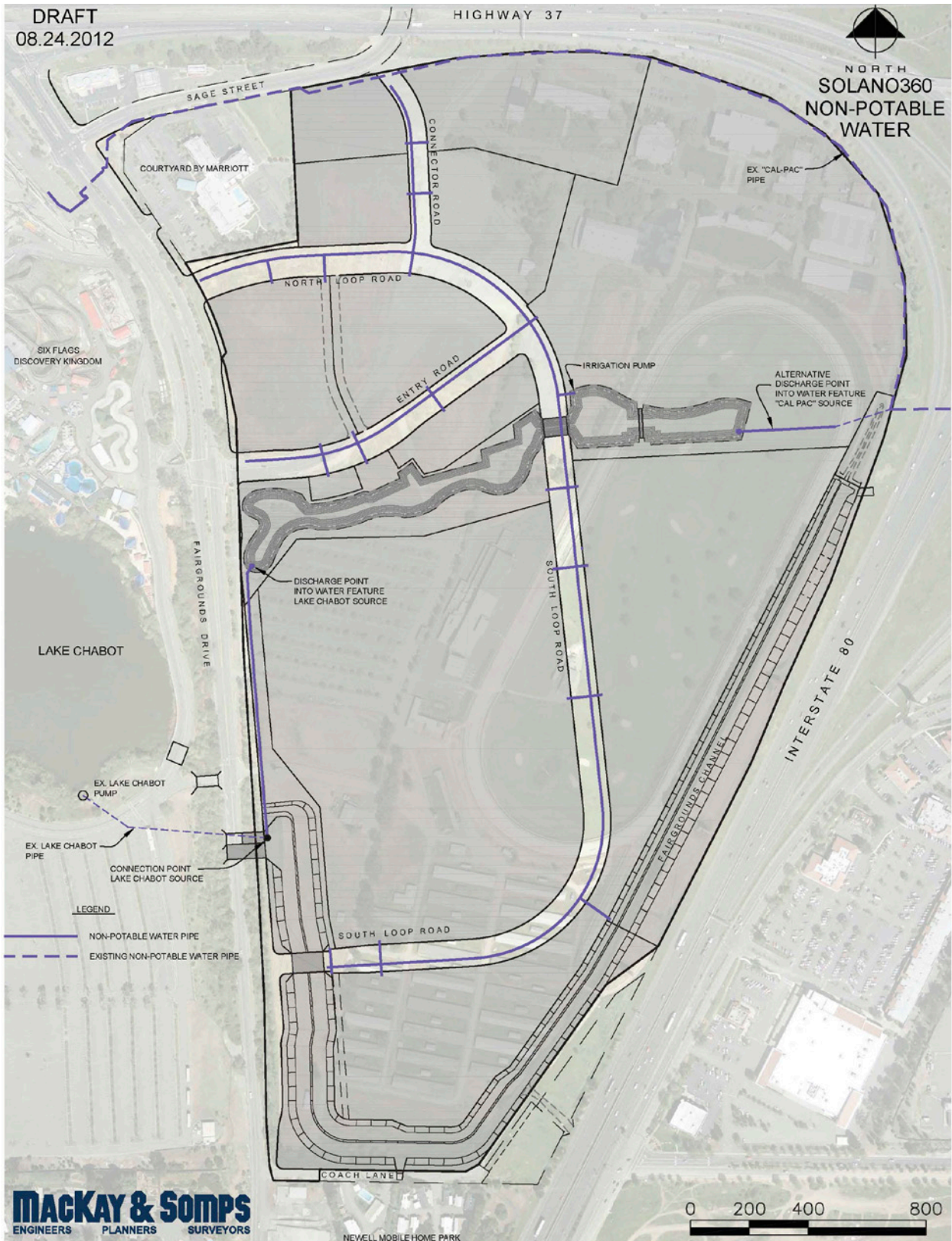


Figure 6.3: Non-Potable Water Exhibit



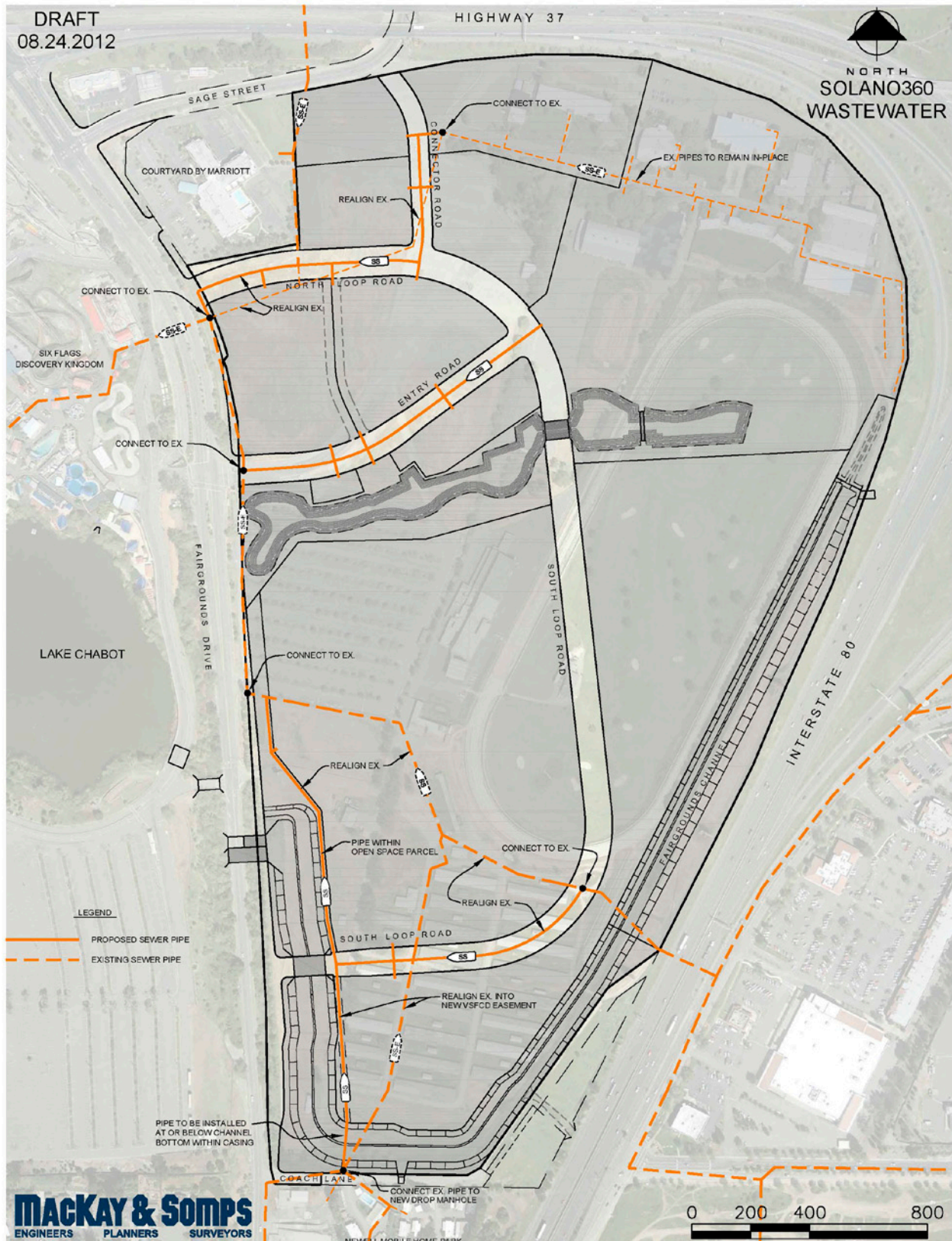


Figure 6.4: Wastewater Exhibit



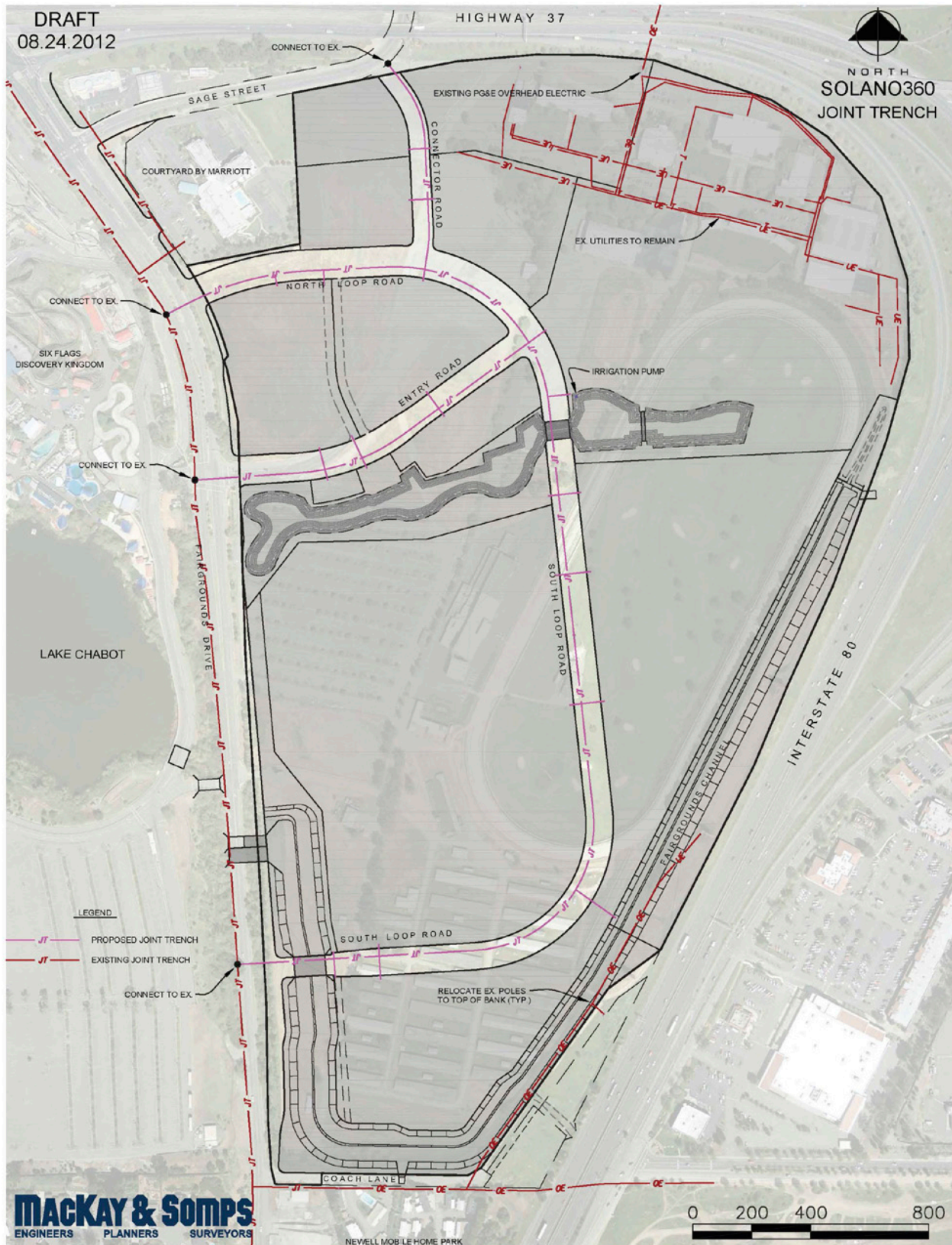


Figure 6.5: Joint Trench Exhibit



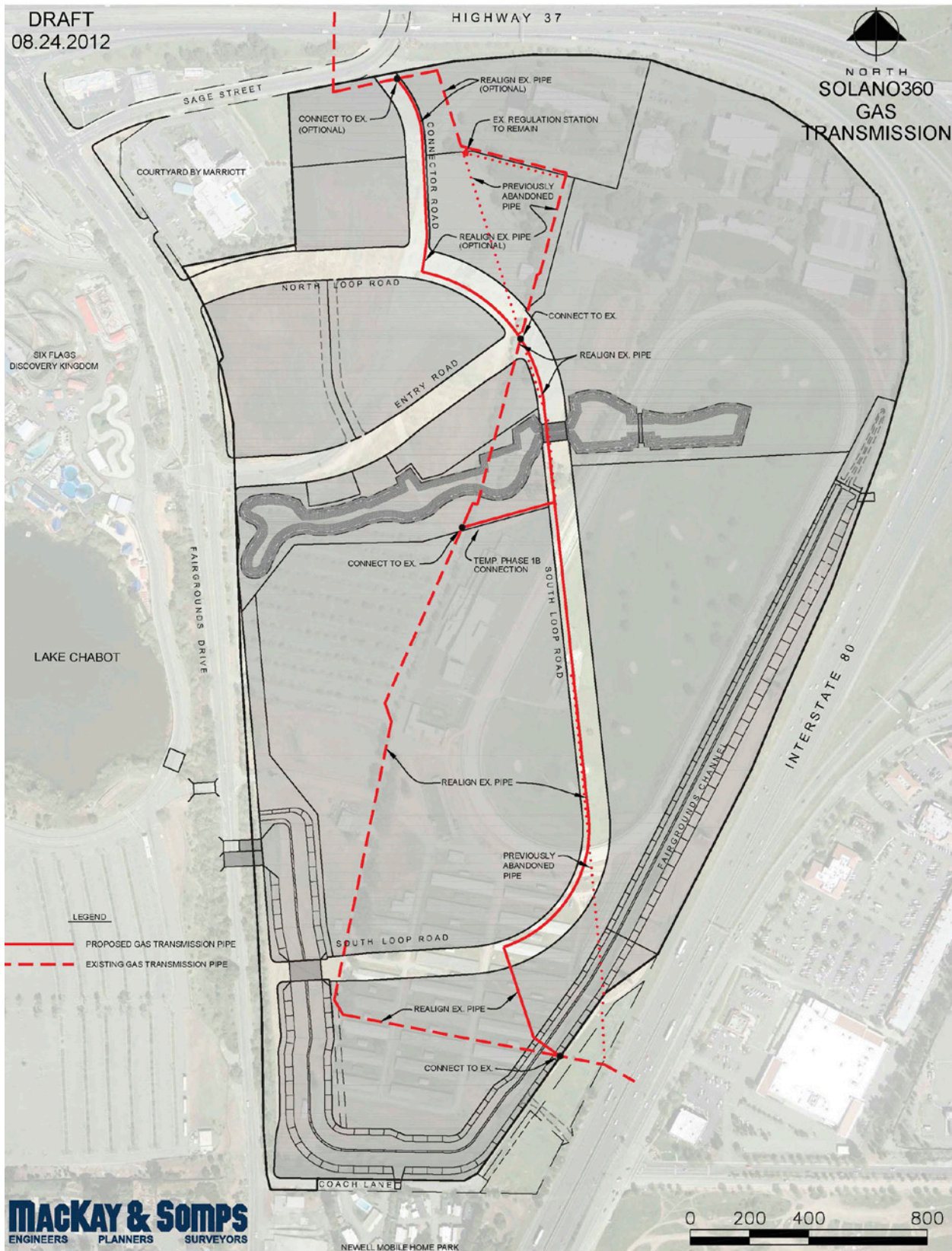


Figure 6.6: Gas Transmission Exhibit

#### **6.4.4 Sustainable Practices for Wastewater**

Water reduction, efficiency and conservation measures should be implemented throughout the Plan Area in order to save potable water and reduce wastewater generation. Reducing wastewater flows improves water quality in the Bay by reducing the amount of discharge into the Bay and helps reduce energy requirements associated with treatment and pumped conveyance.

Reclaimed wastewater facilities may be installed under surface parking areas within the Plan Area; this use is included as a permitted use in Section 3.5.

### **6.5 ENERGY AND TELECOMMUNICATIONS**

#### **6.5.1 Background and Existing Conditions**

Primary power to the Plan Area is currently provided by Pacific Gas & Electric (PG&E) at the north end of the site. An overhead PG&E power line crosses Highway 37 and connects to PG&E transformers behind the "County Building". The power system leaving the transformers is a private system maintained by the County / Fairgrounds Association. The system consists of both overhead and underground facilities.

An additional power source is located at the south end of the site that provides power to the highway signs along I- 80.

Underground joint trench facilities exist in Fairgrounds Drive. It is anticipated that power will be provided to the proposed development from these facilities.

AT&T telephone facilities exist both underground and overhead throughout the site.

A 12" steel gas transmission pipe runs through the site. A gas regulation station is located near the existing Administration Building, which reduces the transmission pressure down to distribution pressure. Distribution pipes are located throughout the site. It is anticipated that a majority of the transmission pipe will need to be relocated as part of the proposed development.

#### **6.5.2 Electricity and Natural Gas**

Natural gas and electricity will be provided to the Plan Area by PG &E. Additional development and build-out of the project as envisioned in this Plan will increase the demand for natural gas and electricity. As noted above it is anticipated that a majority of the existing gas transmission pipe that traverses the Plan Area will need to be relocated.

#### **6.5.3 Telecommunications**

Telecommunication and cable service for the Plan Area will be provided by AT&T and CableCom. Additional development and build-out as envisioned in this Plan will increase the demand for telecommunication and cable service.

### **6.6 PUBLIC SAFETY**

Police and fire protection will be provided by the City of Vallejo. A separate Fiscal Impact Analysis has been prepared by Goodwin Consulting Group for the Solano360 Plan. The Fiscal Impact Analysis indicates that the Plan Area will generate sufficient revenue in each Phase to cover Police and Fire Protection costs.