

Appendix 8:
Sole-Source Aquifer - Water Quality Assessment



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Fulton Mall Reconstruction Project

City of Fresno, California

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Technical Report

Sole-Source Aquifer - Water Quality Assessment

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The purpose of this memorandum is to review and evaluate the potential short- and long-term water quality impacts to the City of Fresno's sole-source aquifer that may result from construction and implementation of the proposed Fulton Mall Project. The location of the project is illustrated on Figures 1 and 2 at the end of the technical report. The project site includes the existing 80-foot rights-of-way within Fulton Mall including Fulton between Inyo Street to Tulare Street, Tulare Street and Fresno Street, and Fresno Street and Tuolumne Street. The project also includes the existing 80-foot rights-of-way along (1) Kern between Van Ness Avenue and Home Run Alley, (2) Mariposa between Van Ness Avenue and Broadway, and (3) Merced between Van Ness Avenue and Congo Alley. In addition to the Mall, there are areas adjacent to the new streets within the Mall that would allow transitional streetscape to accommodate the project. Furthermore, the project includes a parcel at the Fresno County Economic Opportunities Commission campus near the Mariposa and Congo Alley intersection for the proposed tot lot.

The sole-source aquifer in the project area is known as the Fresno Sole Source Aquifer. This aquifer was designated under the authority of Section 1424(e) of the Safe Drinking Water Act, Federal Register (FR) Citation 44 FR 52751, Publication Date – September 10, 1979.

Project Purpose and Need

The purpose of the proposed project is to increase mobility and access in the Fulton Mall study area by providing more convenient multi-modal access options on the Mall and its cross streets; to improve visibility of businesses, offices and other amenities in the Fulton Mall study area by improving traffic circulation, thereby encouraging additional economic development in the area; and to increase the Fulton Mall study area's consistency with the requirements and goals of proposed land use plans by making the area more accessible to the public, thereby encouraging greater public use of the area and bolstering future economic development opportunities.

Proposed Project

The City of Fresno (City) proposes to reconstruct Fulton Mall as a complete street by reintroducing vehicle traffic lanes to the existing pedestrian mall. The Mall consists of six (6) linear blocks that were open to traffic prior to 1964 but now do not allow public vehicle access. The Mall is bound by Tuolumne Street to the north and Inyo Street to the south, and includes portions of three cross streets. The total length of the new roadways would be 0.67 mile; a total of 0.74 mile of existing Fulton Mall right-of-way would be affected.

The "Mall" refers specifically to the pedestrian areas between adjoining buildings located on the former City streets of Fulton, Mariposa, Merced, and Kern, which function as an integrated pedestrian Mall.

Fresno Street and Tulare Street, which do allow vehicle traffic, run through the Mall and divide it into three roughly equal sections. Mall landscaping elements include fountains, planters, benches, sculptures, electrical systems, irrigation systems, and two “tot lots.” The Mall does not include the adjoining buildings or their façades. The City of Fresno is proposing two build options for the Fulton Mall Reconstruction Project. These two build options propose to reconstruct the Mall using “complete streets” design concepts. Complete streets are those designed to function as shared public space, or as “living streets” - for pedestrians, cyclists, outdoor businesses, and slow-moving, cautiously driven vehicles. Complete streets may include narrow roadways, corner bulb-outs, winding streets, and other traffic calming measures to lower driving speeds; street trees and other landscape elements; wide pedestrian sidewalks and crosswalks; and bicycle accommodations such as dedicated bicycle lanes or wide shoulders. The purpose of incorporating these design concepts into the proposed project is to retain portions of the historic fabric and character of the Mall, maintaining the key elements, feeling and unique experience of a pedestrian mall in downtown Fresno.

This Draft EIR addresses two build options, which are described below.

Project Option 1

Option 1 consists of reopening the Fulton Mall with two-way streets, with one lane of vehicular traffic in each direction alongside bicycle, pedestrian, and potentially other travel modes, along the length of the Fulton Mall and three cross streets: Merced between Congo Alley and Federal Alley, Mariposa between Broadway Plaza and Federal Alley, and Kern between Fulton and Federal Alley. On-street vehicle parking spaces would be reintroduced along the length of the Fulton Mall (including cross streets), mid-block pedestrian crossings would be provided, and construction of streetscape improvements would optimize the streets for the new blend of travel modes. One 11-foot-wide vehicle travel lane would run in each direction, with a parallel parking lane of 8 feet included on both sides of the streets. Sidewalks would include a typical 14-foot sidewalk on one side of the street and a 28-foot-wide promenade on the other. This promenade is intended to approximate the mall-like pedestrian experience of the original Eckbo Fulton Mall. Like the existing mall, the Option 1 promenade would feature artworks, water features, seating, and trees and would allow for walking and pedestrian-only seating, landscaping, and lighting. Pedestrians would be separated from vehicles. There are existing street rights-of-way adjacent to the new streets within the Mall that would include minor public infrastructure improvements such as new curb locations, traffic signal improvements, and lane striping. These improvements would provide transitional streetscape to accommodate the project. Under Option 1, the two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be consolidated into one larger tot lot at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley.

Project Option 2

Option 2 consists of reconnecting the street grid similar to Option 1, but would include rebuilding distinctive elements of the Fulton Mall in five to six specific locations, known as “vignettes,” in their exact current size and configuration. The vignettes are intended to preserve existing shade trees and features of the historic Eckbo design, and would include many of the existing elements (sculptures, fountains, pavement pattern, trees, and so on). To accomplish this, the street would have gentle curves that would allow for greater preservation of historic features including fountains, art and existing shade trees. One 11-foot-wide vehicle travel lane would run in each direction and would curve through the vignettes. Outside the vignette areas, the street would straighten, and the landscape would include, where possible, an 8-foot-wide parallel parking lane, as well as a pedestrian-only walking, seating, vegetation, and public art area that varies between 14 and 44 feet wide on each side of the street. Within the vignettes, there would be no parking lane, and the existing Fulton Mall landscape elements would be kept intact as much as possible. The remaining space on each side of the street would be dedicated to pedestrian travel, seating,

vegetation, and artwork. There are existing street rights-of-way adjacent to the new streets within the Mall that would include minor public infrastructure improvements such as new curb locations, traffic signal improvements, and lane striping. These improvements would provide transitional streetscape to accommodate the project. Under Option 2, the two tot lots present, one located near the corner of Merced and Fulton, and the other located near the corner of Kern and Fulton, would be consolidated into one larger tot lot at the Fresno County Economic Opportunities Commission campus near the intersection of Mariposa and Congo Alley.

Environmental Setting

Topography

The Fulton Mall project study area consists predominantly of developed land consistent with the characteristics of an urban center. Single- and multi-story buildings are located throughout the project study area. Fulton Mall and the Cross Malls consist of paved pedestrian pathways. The project study area has generally flat topography at an elevation of approximately 290 feet above mean sea level.

Climate

The City of Fresno has an “inland Mediterranean” climate including long, hot, dry summers and short, foggy winters with low rainfall. The average winter temperatures are in the high 50s degrees Fahrenheit (°F); temperatures below freezing are unusual. Average summer temperatures are in the 90s °F; however, over the greater Fresno area the average is 95 °F. Many summer days have highs exceeding 100 °F. The City of Fresno experiences, on average, a little more than 10 inches annual precipitation.

Soils

The general soil profile within Fulton Mall study area consists of four separate soil series: Delhi loamy sand, Hanford sandy loam, Madera loam, and San Joaquin sandy loam. The soils within the majority of the study area have been altered from their natural state because of grading and compaction for the construction of the existing Fulton Mall and adjacent buildings and infrastructure.

Underground Facilities

No underground storage tanks or monitoring wells are currently located within Fulton Mall. The nearest underground storage tank is located approximately 150 feet west of Fulton Mall and north of Fresno Street. The nearest groundwater monitoring well is located approximately 135 feet east of Fulton Mall and south of Tuolumne Street. There are also groundwater monitoring wells 225 feet west of Fulton Mall and adjacent to Tuolumne Street and 350 feet west of Fulton Mall along Broadway Place.

Surface Water

The primary surface water feature within the City of Fresno is the San Joaquin River, which generally serves as the City’s northern boundary. At 366 miles long, the San Joaquin River is the largest river in Central California, spanning from the Sierra Nevada Mountains to the San Francisco Bay via the San Joaquin Valley. Much of the water that flows through the San Joaquin River is used for irrigation purposes, as much of the agricultural production in the San Joaquin Valley depends on water that at least originated in the River.

The San Joaquin River has been identified by the Central Valley Region Water Quality Control Board (RWQCB) as having numerous beneficial uses, including municipal and domestic water supply, agricultural, industrial, recreational, freshwater and wildlife habitat, and migration and spawning grounds. Water quality in the San Joaquin River is affected by both natural and anthropogenic sources, including soil

erosion; stormwater runoff; wastewater discharges, industrial, residential, and agricultural runoff; recreational activity; and flora and fauna. While the segment of the San Joaquin River in the City is not considered substantially impaired, significant downstream portions of the River throughout the Valley and near the Sacramento-San Joaquin Delta are affected by various constituents and pollutants, usually because of agricultural runoff. The portion of the San Joaquin River in the City does, however, appear on the State Water Resources Control Board's 2010 Impaired Water Bodies/303(d) List for invasive species (non-native fish species).

In addition to the San Joaquin River, a network of agricultural canals and flood control channels traverse the City. Numerous agricultural ponds, recharge basins, and other similar features also dot the City's landscape.

Ground Water

The City of Fresno is underlain by the Kings River Subbasin, which, along with 6 other subbasins, comprises the San Joaquin Basin. In turn, the San Joaquin Basin is located within the Tulare Lake Hydrologic Region. The Tulare Lake Hydrologic Region spans approximately 10.9 million acres (17,000 square miles) and includes most of Fresno County. The Region encompasses the southern one-third of the Central Valley Regional Water Quality Control Board (RWQCB).

Groundwater quality throughout the Tulare Lake Hydrologic Region is generally suitable for most urban and agricultural uses, and meets primary and secondary drinking water standards for municipal use. Local impairments are found in the Tulare Lake Hydrologic Region's groundwater supply, however, with high total dissolved solids (TDS), nitrate, arsenic, and organic compounds acting as the primary constituents of concern within the Region. With the exception of western portion of the Tulare Lake Hydrologic Region, the Region lacks any substantial low permeability units that would isolate deep from shallow aquifers. As such, most of the aquifer underlying the project area is unconfined. As a single, unconfined aquifer, the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 1424(e) of the Federal Safe Drinking Water Act. This designation means that project area is dependent on a single source of groundwater and that this sole source must be protected from contamination.

While the groundwater supply within the Kings River Subbasin generally meets drinking water standards, with the exception of the northwest portion of the City, extensive contamination occurs throughout the City. Of the City's 272 groundwater wells, 96 wells are impacted by one contaminant plume, 33 wells are impacted by two contaminant plumes, and 5 wells are impacted by three contaminant plumes. Thirty-four of the City's active wells currently have wellhead treatment systems.

Several different types of pollutants have contaminated portions of the City. Major contaminant plumes include dibromochloropropane (DBCP), ethylene dibromide (EDB), trichloropropane (TCP), other volatile organic compounds (VOCs) like trichlorethylene (TCE), tetrachloroethylene (PCE), nitrate, manganese, radon, chloride, and iron. Nitrate, pesticides, and nutrients in agricultural drainage are currently found within much of the project area's groundwater supply, and their levels exceed some drinking water standards established by the State. While nitrates may occur naturally, their presence is often attributed to anthropogenic reasons. Leaking septic tanks, which are prevalent in the less dense southeast portion of the City, are a substantial source of nitrate contamination. Another major problem facing the City's groundwater supply is the presence of DBCP in the City's groundwater wells. This fumigant was widely used in the 1960s to control nematodes in vineyards and is now present in down gradient groundwater wells.

Storm Drainage System

Storm drain facilities are located within the Fulton Mall study area. A storm drain is located under Fulton Mall between Inyo Street and Tuolumne Street. Additional storm drains are located within Merced Mall between Van Ness Boulevard and H Street, Fresno Street between Van Ness Boulevard and H Street, Mariposa Mall between the alley east of Fulton Mall and H Street, Tulare Street between the alley west of Fulton Mall and H Street, Kern Mall between the alley west of Fulton Mall and the alley east of Fulton Mall, and along Home Run Alley between Kern Mall and Tulare Street. Each of the existing subsurface drainage distribution facilities identified above is currently adequate to serve the existing uses.

The existing Fulton Mall and the Cross Malls currently have storm drain inlets that convey water to the existing subsurface drainage distribution facilities. There are currently 63 storm drain inlets within Fulton Mall and 32 storm drain inlets within the Cross Malls. The existing storm drain inlets within the malls are adequate to convey storm water to the subsurface drainage distribution facilities.

The existing subsurface storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines. These trunk lines connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno and extend to existing retention basins. Storm water from Fulton Mall is not currently treated on site. The storm water is conveyed to the storm drain system and eventually is conveyed to existing retention basins. The retention basins provide a natural filtration of storm water that is collected from the downtown area prior to infiltrating into the groundwater aquifer. No additional storm water treatment is provided.

Potential Project Impacts

Short-Term Construction Impacts

Construction of the proposed Fulton Mall project would require reconstruction activities that would disturb more than one acre. During these activities, there would be a potential for stormwater flows to carry onsite sediments, debris, and constituents into the existing storm drainage facilities that serve the project area. Once within the storm drainage system, these materials could be conveyed downstream and into local waterways. Since these materials have the potential to enter the storm drainage system during the construction phase, there is a potential for the proposed project to degrade water quality. As addressed in the Environmental Setting discussion above, the project area is underlain by a single, unconfined aquifer. In light of this, any degradation of water quality within this aquifer would be especially problematic, as the groundwater basin within the project area has been designated as a Sole Source Aquifer as authorized by Section 1424(e) of the Federal Safe Drinking Water Act.

Project construction would also require the use of gasoline- and diesel-powered equipment and vehicles, including bulldozers, backhoes, flatbed trucks, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, oils, paints, and solvents would likely be used during project construction. An accidental release of any of these substances could degrade the quality of stormwater runoff and contribute additional sources of pollution into the storm drainage system.

There are, however, regulatory mechanisms in place that would reduce the effects of project construction on water quality, including the National Pollutant Discharge Elimination System (NPDES) General Permit. Construction of the proposed project would be required to comply with the requirements of the NPDES General Permit. The NPDES Permit Program, which is administered by the Central Valley RWQCB, helps control water pollution by regulating point sources that discharge pollutants into receiving waters during both construction and operational activities.

Any development project disturbing more than one acre of soil must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit

Order 2009-0009-DWQ). Construction activities subject to the Construction General Permit includes clearing, grading, and other ground- disturbing activities such as stockpiling or excavation. The Construction General Permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Among other mandated items that are included in a SWPPP, the SWPPP would contain features designed to protect against substantial soil erosion as a result of water and wind erosion, known as Best Management Practices (BMPs). Common BMPs include maintaining or creating drainages to convey and direct surface runoff from bare areas and installing physical barriers such as berms, silt fencing, wattles, straw bales, and gabions.

Surface water drainage from the Fulton Mall study area is conveyed to existing retention basins that are used to recharge groundwater. The implementation of BMPs as part of the SWPPP would minimize effects on the sole-source aquifer. Furthermore, the implementation of the BMPs would minimize construction sediment and contamination constituents from entering the groundwater by way of nearby monitoring wells.

Construction activities associated with the project do not include the installation of underground storage tanks or monitoring wells. The existing Fulton Mall features that will be removed as part of the construction activities do not contain deep pilings that would provide access to the existing aquifer. In addition, construction activities will not generate liquid waste. Demolition activities will generate solid waste and each type of material such as pavement concrete and green waste from trees and shrubs will be removed from the site with the use of dump trucks. The nearest existing wells to the proposed construction site are located adjacent to Tuolumne Street and are 140 feet and 150 feet from the site. These monitoring wells are located

The depth of excavation during construction is estimated to be approximately 15 feet below ground surface. The nearest risk of groundwater contamination is from the Van Waters Roger site located at 1152 G Street. This site is currently an open cleanup site with tetrachloroethene that has been released to soils and groundwater. A remediation action plan has been prepared for the site and monitoring wells that include one well located approximately 135 feet east of Fulton Mall and south of Tuolumne Street, a second well 225 feet west of Fulton Mall and adjacent to Tuolumne Street, and a third well 350 feet west of Fulton Mall along Broadway Place have been installed. Two of the three monitoring wells are located on sidewalks and a third is located on a concrete pad. The top of all three monitoring wells are raised above street level, flush with the concrete sidewalk or concrete pad, covered, and include waterproof locking well caps. Based on the distance of the monitoring well to the proposed construction activities, the location of the wells above street level, and the presence of water proof locking well caps, the wells would not provide a direct route for any potential construction contaminants to access the aquifer. Furthermore, construction activities which include excavation activities up to 15 feet below ground surface would not impact groundwater because the depth of groundwater in this area is between 73 feet and 121 feet below ground surface. Therefore, the proposed project would not result in a substantial impact on groundwater quality.

Long-Term Operational Impacts

Based on highway storm water runoff data collected by the Caltrans Storm Water Research and Monitoring Program, typical pollutants from California highways include heavy metals, sediment, and litter. All constituents and parameters in nearby surface water bodies found to be elevated or exceeding published water quality standards could be potential concerns for the proposed project.

The pedestrian mall is currently served by 95 storm drain inlets that collected surface flows from the project area. Adjacent streets such as Fresno and Tulare Streets also have their own storm drain facilities that convey flows from the roadway. Both the onsite and adjacent storm drain facilities presently connect

with the existing storm drain facilities located throughout Fulton Mall vicinity, as addressed in the Environmental Setting discussion above. These existing storm drain facilities are connected to one of several larger east-west and northeast-southwest trending trunk lines, which eventually connect with a series of existing drainage basins located along S. West Street in the southwestern portion of the City of Fresno. As previously stated, the existing subsurface drainage distribution facilities identified above are currently adequate to serve the existing uses found in the project area. The proposed project includes removal of the impervious pavement throughout Fulton Mall and replacing the pavement with an asphalt street and concrete sidewalk that are also impervious. No increase in impervious surfaces would occur with the proposed project.

Due to the reconstruction of Fulton Mall and the Cross Malls with the implementation of complete streets for Fulton, Kern, Mariposa, and Merced streets, the location of the existing storm drain inlets will be modified. The existing storm drain inlets that are located within the future street (i.e., between the proposed curbs and gutters of each street) will be relocated to the curb face because the future streets will be designed to include a crown in the middle of the street so that surface water will flow to the curb face.

The project will also include the reconstruction of the sidewalks adjacent to the future streets. Therefore, there may be relocation of additional existing storm drain inlets. The inlets may remain in the sidewalks or the sidewalk may be graded so that surface water flows to the street and eventually to the storm drain inlets at the curb face.

Although the proposed project would potentially reintroduce vehicles onto Fulton, Mariposa, Merced, and Kern Streets, the project would not contribute additional pollutants to the existing storm drain system because the project will result in a redistribution of existing vehicles. No increase in vehicles would occur with the implementation of the project. No changes in the treatment of storm water after the project is complete would occur. Storm water would continue to be conveyed to down gradient retention basins that would provide natural filtration prior to storm water infiltrating into the groundwater aquifer. The project will not include the generation of liquid or solid waste. Therefore, the project would result in no long-term impact on water quality and will not have a long-term impact on the existing sole-source aquifer.

The project does not include any improvements that would be beneficial to the existing sole source aquifer.

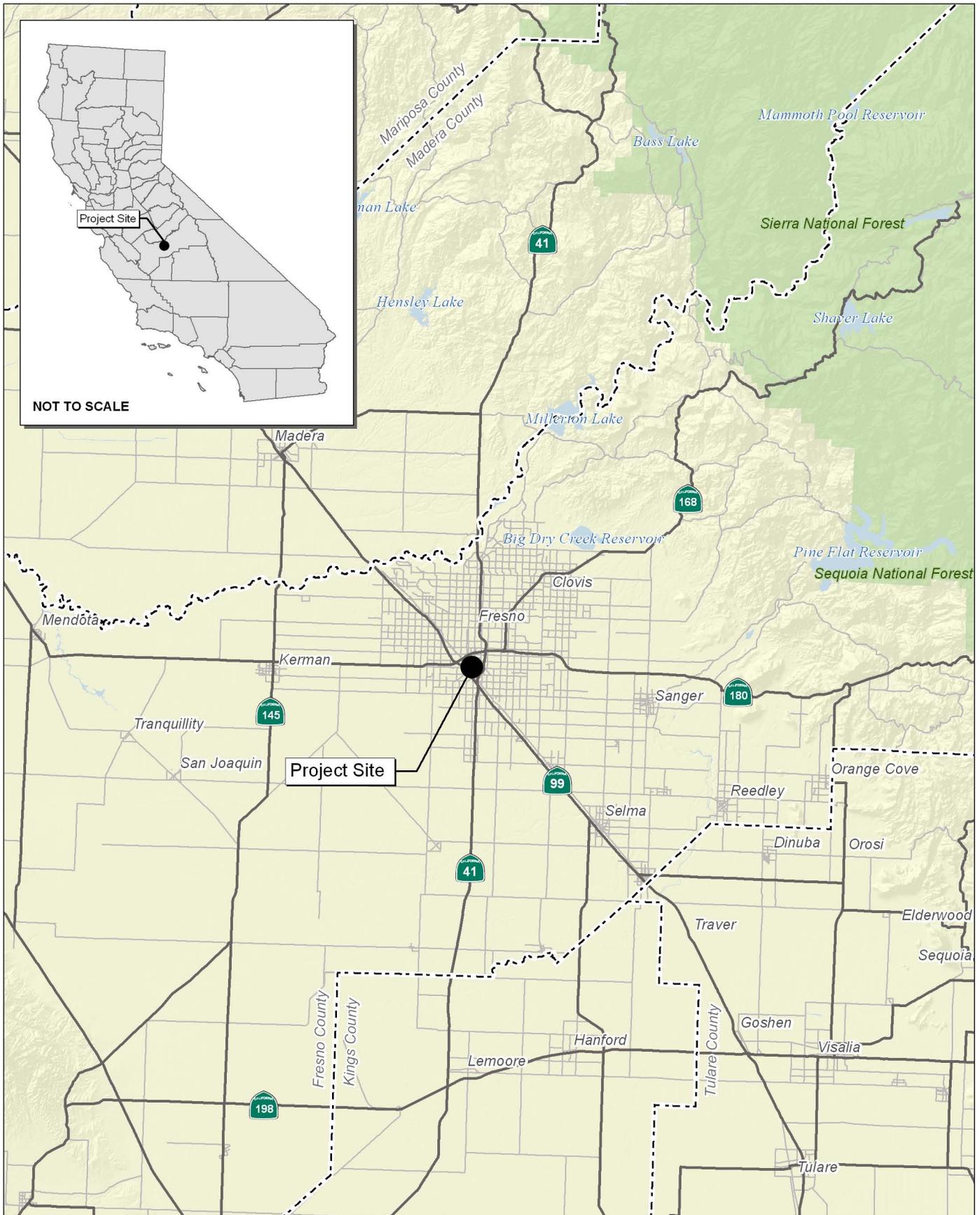
Mitigation Measures

Prior to the issuance of grading permits, construction of the Fulton Mall project would be required to comply with all applicable requirements of the NPDES Permit Program, which includes the preparation and participation with the Construction General Permit and implementation of a SWPPP and BMPs. Notice of Construction (NOC) shall be submitted to the Central Valley Regional Water Quality Control Board (RWQCB) at least 30 days before the start of construction and submission of a Notice of Construction Completion (NCC) shall be submitted to the RWQCB upon completion of construction and stabilization of the project site.

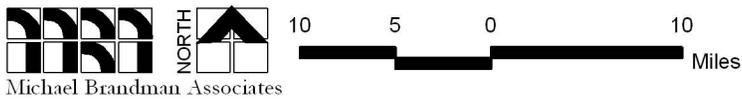
Prior to the issuance of a grading permit, specific locations of relocated storm drain inlets within the existing malls shall be approved by the City of Fresno Public Works Department.

Prior to issuance of a grading permit, a response plan for accidental spills during construction activities shall be prepared.

Implementation of the above measures would minimize the short-term construction impacts on water quality.

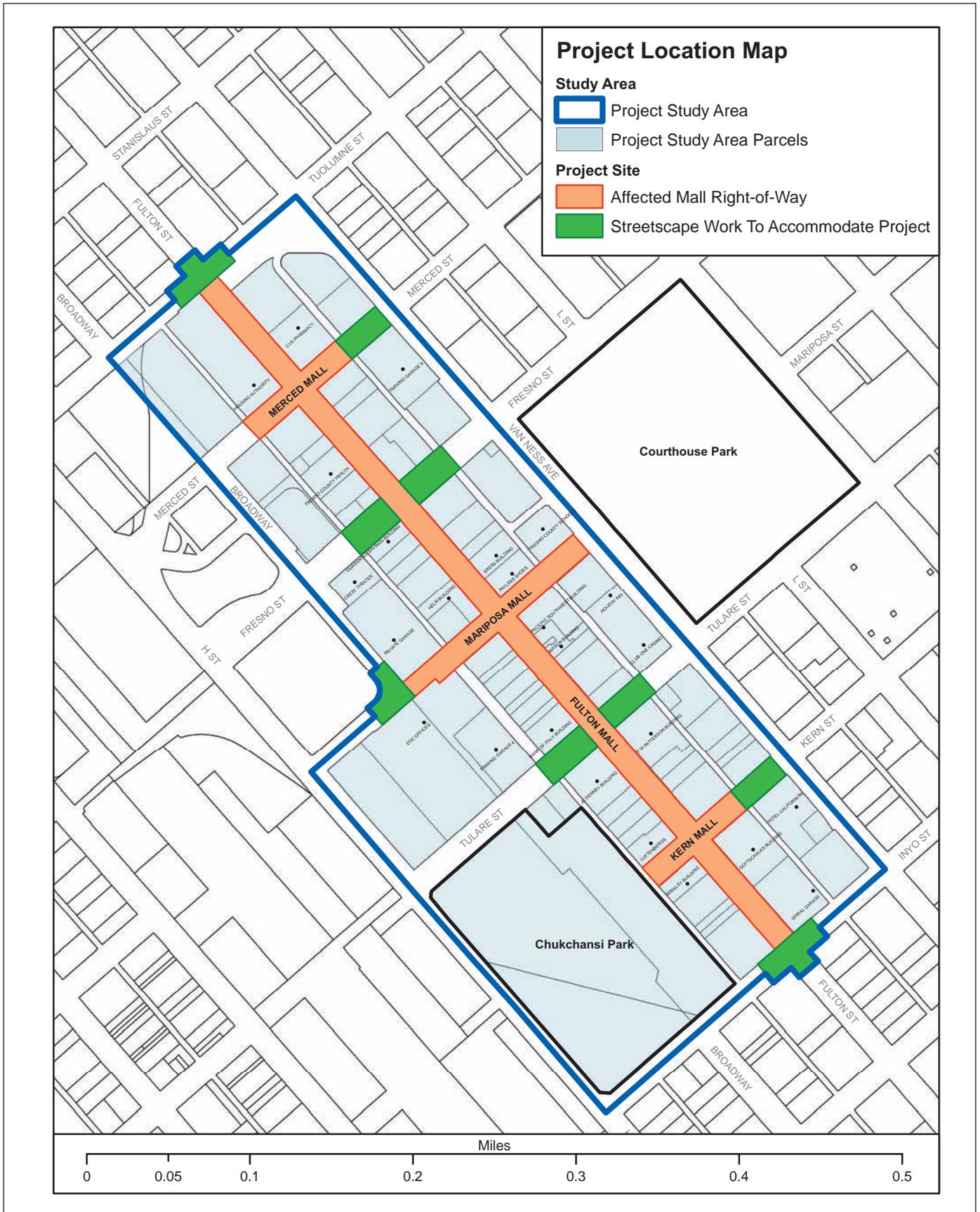


Source: Census 2000 Data, The CaSIL, MBA GIS 2013.



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Figure 1
Regional Location Map



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Figure 2
Project Location Map