



Downtown Station Area Plan

Key Considerations

Water, Wastewater, and Stormwater

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Introduction

This memorandum briefly summarizes existing utilities and infrastructure systems connected to the Downtown Station Area Plan (DSAP) boundary, encompassing approximately 650 acres or just over one square mile. Three topics are covered: water, wastewater, and stormwater. Each section outlines applicable federal, state, and local regulations and summarizes the existing conditions as they relate to the DSAP. The goal of this memorandum is to briefly summarize the status of the public infrastructure within the DSAP and identify preliminary considerations for land use planning efforts within the area as may be informed by the status of water, wastewater, or stormwater infrastructure and provision of services.

Water

Regulatory Setting and Background

This section outlines the federal, State, and local regulations and plans governing water supply, quality, and use.

Federal

Clean Water Act

The Clean Water Act (CWA) (33 United States Code Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA required states to set standards to protect, maintain, and restore water quality through the regulation of point-source and certain non-point-source discharges to surface water. Those discharges are regulated by the National Pollution Discharge Elimination System (NPDES) permit process (CWA Section 402). In California, NPDES permitting authority is delegated to and administered by the nine Regional Water Quality Control Boards (RWQCBs.) The City of Merced is within the Central Valley RWQCB. Projects that disturb one or more acres are required to obtain an NPDES permit.

Safe Water Drinking Act

The federal Safe Drinking Water Act (SDWA) establishes standards for contaminants in drinking water supplies. Contaminants regulated by the SDWA include metals, nitrates, asbestos, total dissolved solids, and microbes. The United States Environmental Protection Agency (USEPA) sets the national drinking water standards by imposing regulations on contaminants that are detrimental to public health. The administrator of the USEPA is responsible for oversight and enforcement of these standards.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Water Code Sections 13000 et seq.), passed in 1969, requires protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls. The Porter-Cologne Act established the State Water Resources Control Board (SWRCB) and divided California into nine regions, each overseen by a RWQCB. The SWRCB is the primary State agency responsible for protecting the quality of the State's surface and groundwater supplies and has delegated primary implementation authority to the nine RWQCBs. The Porter-Cologne Act assigns responsibility for implementing the CWA Sections 401 through 402 and 303(d) to the SWRCB and the nine RWQCBs.

The Porter-Cologne Act requires the development and periodic review of water quality control plans (basin plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters, provide the technical basis for determining waste discharge requirements, identify enforcement actions, and evaluate clean water grant proposals. The basin plans are updated every three years. Compliance with basin plans is primarily achieved through implementation of the NPDES, which regulates waste discharges as discussed above. The City of Merced is located within the Central Valley RWQCB and is subject to the Central Valley Basin Water Quality Control Plan (discussed in more detail below).

California Safe Drinking Water Act

California enacted its own Safe Drinking Water Act (California SDWA) in 1976. The SWRCB has been given primary enforcement responsibility for the California SDWA. Title 22 of the California Administrative Code establishes SWRCB authority and stipulates drinking water quality and monitoring standards. These standards are equal to or more stringent than the federal standards.

Recycled Water Regulations

Within California, recycled water is regulated by the USEPA, the SWRCB and RWQCBs. The SWRCB has adopted Resolution No. 77-1, "Policy with Respect to Water Reclamation in California." This policy states that the SWRCB and RWQCBs will consider, encourage, and recommend for funding water reclamation projects that do not impair water rights or beneficial in-stream uses. The SWRCB establishes the recycled water uses allowed in California and designates the level of treatment required for each of these designated uses. The RWQCBs implement the SWRCB Guidelines for Regulation of Water Reclamation and issue waste discharge permits that serve to regulate the quality of recycled water based on stringent water quality requirements.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) is a package of three bills (Assembly Bill [AB] 1739, Senate Bill [SB] 1168, and SB 1319) that provides local agencies with a framework for managing groundwater basins in a sustainable manner. Under SGMA, local agencies within high- and medium-priority groundwater basins were required to form a local Groundwater Sustainability Agency (GSA) by June 30, 2017. GSAs were required to adopt a Groundwater Sustainability Plan (GSP) either by January 31,

of 2020 for critically over drafted basins, or 2022 for all other basins. GSPs are required to demonstrate how the basin would reach sustainability within 20 years of adopting their GSP. Discussed in further detail below, the City of Merced is located within the boundaries of the Merced Irrigation-Urban Groundwater Sustainability Agency (MIUGSA) and is subject to the Merced Groundwater Subbasin GSP (discussed further below).

GSPs must consider all beneficial uses and benefitting users of the groundwater basin and include measurable objectives and interim milestones that ensure basin sustainability. Sustainable management is defined under SGMA as the absence of undesirable results, which consist of:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degradation of water quality
- Significant and unreasonable land subsidence
- Groundwater-related surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of surface water

Urban Water Management Planning Act of 1983

The California Urban Water Management Planning Act requires all publicly or privately owned utility agencies that provide water service to more than 3,000 service connections or over 3,000 acre-feet per year (AFY) to prepare an Urban Water Management Plan (UWMP). Each UWMP is intended to support long-term resource planning and ensure suppliers have adequate supplies for existing and future demand. UWMPs are required to quantify savings mandated under other State regulations. The City of Merced UWMP was updated in 2020, as discussed below.

Senate Bill 610 and Senate Bill 221

SB 610 and SB 221 amended the Urban Water Management Planning Act on January 1, 2002. The purpose of these bills was to improve the link between information on water supply availability and certain land use decisions made by cities and counties. Both bills require that detailed and accurate information regarding water supplies and availability be provided to decision makers prior to approval of specified large development projects.

CALGreen Building Code

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24, California Code of Regulations [CCR], known as "CALGreen") applies to the planning, design, operation, construction, use, and occupancy of newly constructed buildings and structures throughout the State of California. CALGreen established planning and design standards for sustainable site development, including water conservation, and requires new buildings to reduce water consumption by 20 percent. The mandatory provisions of CALGreen became effective on January 1, 2011. The building efficiency standards are enforced through the local building permit process.

California Plumbing Code

The 2010 California Plumbing Code (Part 5, Title 24, CCR) was adopted as part of the California Building Standards Code. The general purpose of the California Plumbing Code is to prevent disorder in the industry as a result of widely divergent plumbing practices and the use of many different, often conflicting, plumbing codes by local jurisdictions. Among many topics covered in the code are water fixtures, potable and non-potable water systems, and recycled water systems. Water supply and distribution systems must comply with all applicable provisions of the current edition of the California Plumbing Code.

Local

City of Merced 2020 Urban Water Management Plan

The City of Merced 2020 Urban Water Management Plan (UWMP) was adopted in accordance with the requirements of the Urban Water Management Planning Act of 1983, discussed above. It focuses on the City of Merced's (City) water supply and provides guidance for efficient water supply use and conservation of water, anticipates future water supply needs, and describes actions to undertake during a drought.

The Sacramento River Basin and San Joaquin River Basin Water Quality Control Plan

As relayed in the Porter-Cologne Water Quality Control Act discussion above, there are nine RWQCBs statewide. The City of Merced is within the Central Valley RWQCB boundaries. The Central Valley RWQCB requires two water quality control plans be created within its borders, one for the Tulare Lake Basin and one for the Sacramento River Basin and San Joaquin River Basin, where Merced is located. The Plan defines how the quality of surface and groundwater within its boundaries should be managed in order to provide the best water quality possible. The Plan is enforced by the Central Valley RWQCB through waste discharge requirements to public and private entities whose discharges affect water quality. These discharge requirements are set by both the State and the Federal government but are enforced at the local level.

Merced Groundwater Sustainability Plan

As relayed in the Sustainable Groundwater Management Act discussion above, local agencies within high- and medium-priority groundwater basins were required to form local GSAs. The City of Merced is located within the Merced Subbasin of San Joaquin River Basin. The County of Merced and water purveyors and cities within the Merced Subbasin formed three GSAs in accordance with SGMA, the City of Merced is a part of the Merced Irrigation-Urban Groundwater Sustainability Agency. The GSAs coordinated efforts to develop the Merced Groundwater Subbasin Groundwater Sustainability Plan. The purpose of this Groundwater Sustainability Plan is to bring the Merced Groundwater Basin (Merced Subbasin or Subbasin), a critically overdrafted basin located within the San Joaquin Valley, into sustainable groundwater management by 2040. The Subbasin is heavily reliant on groundwater, and users recognize the Subbasin has been in overdraft for a long period of time.

City of Merced Water Master Plan (2014)

The City of Merced's Water Master Plan, last updated in 2014, serves as a strategic framework for planning and expanding the City's water system to meet projected potable water demands through 2030. The plan evaluates existing and anticipated water usage, supply sources, and infrastructure requirements to support future growth.

Existing Setting

Water Service

The City of Merced's water supply is managed by the City's Public Works Department and serves a population of approximately 99,100 residents, including the University of California Merced (UC Merced) and some Merced County islands. The City is defined by three primary geographic boundaries: the City limits (23.1 sq mi), the Specific Urban Development Plan (SUDP) boundary, and the Sphere of Influence (SOI); the latter two are coterminous and encompass 44.7 sq mi.¹ The DSAP is within the City limits and is served by the City water supply as part of an integrated system.

Water Supply and Demand

In 2020, the City of Merced supplied 20,076 acre-feet (AF) of potable water to meet existing demand, relying exclusively on groundwater from 20 active wells.² Of the 20 active wells, only wells 3C and 5B are within the DSAP, located at 511 West 12th Street and 1632 R Street, respectively (see **Figure 1**).³

Historical data from the 2012–2016 drought, the driest five-year period on record, showed no reduction in groundwater production, supporting the assumption that supplies will remain reliable during similar drought conditions in the near term. However, the City acknowledges that water quality concerns, potential regulatory changes related to emerging contaminants, and evolving aquifer conditions could pose risks to supply reliability and will be monitored closely.⁴ For example, some wells exceed maximum contaminant levels for arsenic, perchloroethylene, methyl tert-butyl ether, and nitrate; the City currently mitigates these through blending or taking contaminated wells offline.⁵

Potable water demand is projected to increase to 31,825 AF by 2040 primarily due to population growth within the City and increased enrollment at UC Merced. The City's water supply is expected to sufficiently meet new demands through installation of additional groundwater wells and construction of a 10 million gallon per day (mgd) surface water treatment plant (SWTP). The SWTP is projected to use surface water supplied by Merced Irrigation District (MID) and begin operation by 2030.⁶

¹ City of Merced UWMP, August 2021, page 3-2

² City of Merced UWMP, August 2021, page 1-5

³ City of Merced Water Master Plan, January 2014, page ES-4

⁴ City of Merced UWMP, August 2021, page 7-9

⁵ City of Merced UWMP, August 2021, page 7-2

⁶ City of Merced UWMP, August 2021, page 1-5

The existing water supply is expected to remain sufficient even in dry years.

Distribution Infrastructure

As mentioned above, wells 5B and 3C are located within the DSAP. Like most City wells, well 5B pumps directly into the distribution system via vertical turbines; however, well 3C discharges into an elevated storage tank, with system pressure maintained by gravity. As the water rests in the tank, heavier particles such as sand and gravel gradually settle to the bottom, effectively separating from the water. This process ensures that the water distributed to homes and businesses is free of these sediments. The pressures in the distribution system are therefore set by the height of the water tanks.⁷

Altogether, the City of Merced operates approximately 1.5 million linear feet of water system pipelines, typically ranging from 4 to 16 inches in diameter. These pipelines are constructed from cast iron, ductile iron, and polyvinyl chloride (PVC). Cast iron pipelines were primarily installed between 1940 and 1960, while ductile iron pipelines were installed from 1950 to 1992. Since 1990, all water mains 12 inches and larger have been constructed using ductile iron, whereas pipelines under 12 inches in diameter, primarily serving residential subdivisions, are made of PVC.⁸ It is anticipated that the majority of downtown pipelines, where the DSAP is located, are comprised of cast iron and ductile iron, though some other materials may have been used earlier in the 20th Century.

The City also maintains four elevated storage tanks located at pump stations 1, 2, 3, and 7, with a total storage capacity of 1.5 million gallons.⁹ Of these, only pump station 3 is in the DSAP. These tanks operate based on the hydraulic grade line of the connected pipelines, filling and draining in response to system demand. Well pumps at these tank sites are automated and operate according to preset water levels in the tanks.¹⁰

Considerations

Key considerations related to water for the DSAP include:

- The City provides water to 99,100 residents, including UC Merced and county unincorporated islands.
- All water supply for the City of Merced is currently from groundwater; however, additional supplies through surface water are expected in 2030.
- Water supplies are expected to remain reliable during drought conditions in the near term.
- Two of the 20 active wells, 3C and 5B, are within the DSAP.
- Well 5B pumps directly into the distribution system comprised of cast iron and ductile iron pipes.
- Well 3C relies on an elevated storage tank for sedimentation settling and maintaining system pressure through gravity.

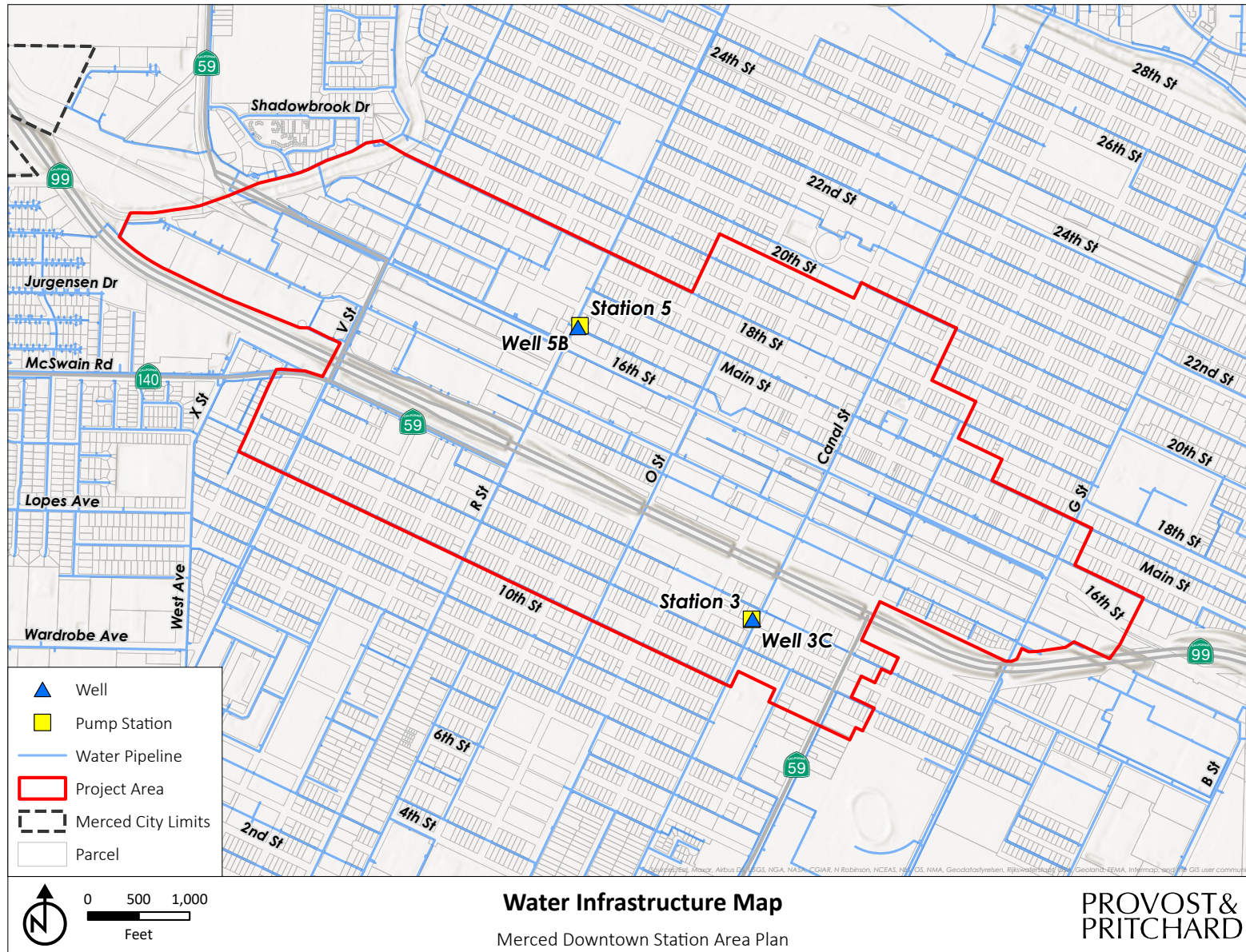
⁷ City of Merced Water Master Plan, January 2014, page ES-4

⁸ City of Merced Water Master Plan, January 2014, page 3-5

⁹ City of Merced Water Master Plan, January 2014, page 3-5

¹⁰ City of Merced Water Master Plan, January 2014, page 3-1

Figure 1: Water Infrastructure



Wastewater

Regulatory Setting and Background

This section outlines the federal, State, and local regulations and plans governing wastewater treatment, disposal, and use.

Federal

Title 40 of the Code of Federal Regulations

The USEPA oversees and manages Title 40 of the Code of Federal Regulations (CFR). Title 40 provides regulations regarding the protection of human health and the environment.

Title 40 of CFR Part 503

Title 40 of the CFR, Part 503 regulates standards for the use and disposal of sewage sludge that is applied to land, fired in a sewage sludge incinerator, or placed on surface disposal site. It includes pollutant limits, requirements for pathogen and vector attraction reduction, management practices, monitoring, recordkeeping, and reporting among other requirements. Title 40 of CFR Part 503 applies to any person or treatment works that prepares sewage sludge, applies sewage sludge to the land, fires sewage sludge in an incinerator, and the owners and operators of surface disposal sites.

See the Federal Regulatory Setting section in the Water section for additional federal regulations for wastewater and the Clean Water Act.

State

Assembly Bill 885

AB 885 mandates the establishment of statewide standards set by the SWRCB to regulate the placement and use of on-site wastewater treatment systems. AB 885 requires each regional board to incorporate the SWRCB's regulations or standards into the appropriate regional water quality control plans (i.e., Basin Plans).

California Code of Regulations Title 22, Division 4, Chapter 3

CCR Title 22, Division 4, Chapter 3, regulates the production and use of recycled waters. The Central Valley RWQCB issues water quality and treatment process requirements for recycled water through the waste discharge permit process. Under CCR Title 22, Division 4, Chapter 3, a supply source of recycled water, such as a wastewater treatment plant, must meet standards to protect public health and the environment.

Local

City of Merced Wastewater Collection System Master Plan 2022 Update

The Merced Wastewater Collection System Master Plan, completed in 2023, provides the City's wastewater design criteria by analyzing flow monitoring data to establish a per capita generation rate, future wastewater flow projections, and options to meet the needs of the City's 2030 General Plan. It includes an assessment of existing system capacity, incorporating findings from the June 2020 hydraulic model and alternatives analysis, and re-evaluates trunk sewer capacities under future development scenarios. The plan also revisits previously considered trunk alignment alternatives, recommends upgrades or improvements to address system deficiencies, and proposes capital improvement projects with cost estimates to support both existing infrastructure and anticipated growth.

Existing Setting

Wastewater Service

The City's existing wastewater service area encompasses 10.5 sq mi (6,697 acres)¹¹ and serves an estimated population of 83,700¹², which includes residential, commercial, industrial, and public users. The City owns, operates, and maintains its wastewater collection system. The service area is geographically divided into North and South Merced by Bear Creek for the purposes of conveyance improvement planning. The DSAP is located south of Bear Creek.¹³

Wastewater Conveyance

Wastewater is conveyed to the City's Wastewater Treatment Facility (WWTF), located southwest of the City limits through over 400 miles of gravity sewer lines ranging from 6 to 54 inches in diameter, as well as force mains and lift stations.^{14,15} There are three sewer main trunk lines that convey wastewater from the DSAP, as shown in **Figure 2**.¹⁶

There are no deficiencies in existing system, though some lines have limited residual capacity.^{17, 18} Of particular concern is the existing 48-inch interceptor trunk that connects to the WWTF via West Avenue.

¹¹ City of Merced Wastewater Collection Master Plan, February 2023, page 15

¹² City of Merced Wastewater Collection Master Plan, February 2023, page 9

¹³ City of Merced Wastewater Collection Master Plan, February 2023, page 9

¹⁴ City of Merced Wastewater Collection Master Plan, February 2023, page 9

¹⁵ City of Merced UWMP, August 2021, page 6-7

¹⁶ City of Merced Wastewater Collection Master Plan, February 2023, page 10

¹⁷ City of Merced Wastewater Collection Master Plan, February 2023, page 36

¹⁸ City of Merced Wastewater Collection Master Plan, February 2023, page 37

This line is significantly corroded and has a shallow slope, resulting in conveyance inefficiencies.¹⁹ As a result, intensification of development within the City, including the DSAP, will be limited by the need to improve this line.

Treatment Capacity

The WWTF provides tertiary treatment to 33,029 equivalent dwelling units (EDU). An EDU is a unit of measure that normalizes all land use types to the equivalent wastewater demand of one single-family residential unit. Currently, the permitted capacity is 12.0 million gallons per day (mgd), with expansion planned for up to 20.0 mgd. Treated effluent is used for agriculture and wetland habitat outside the City limits.²⁰

Considerations

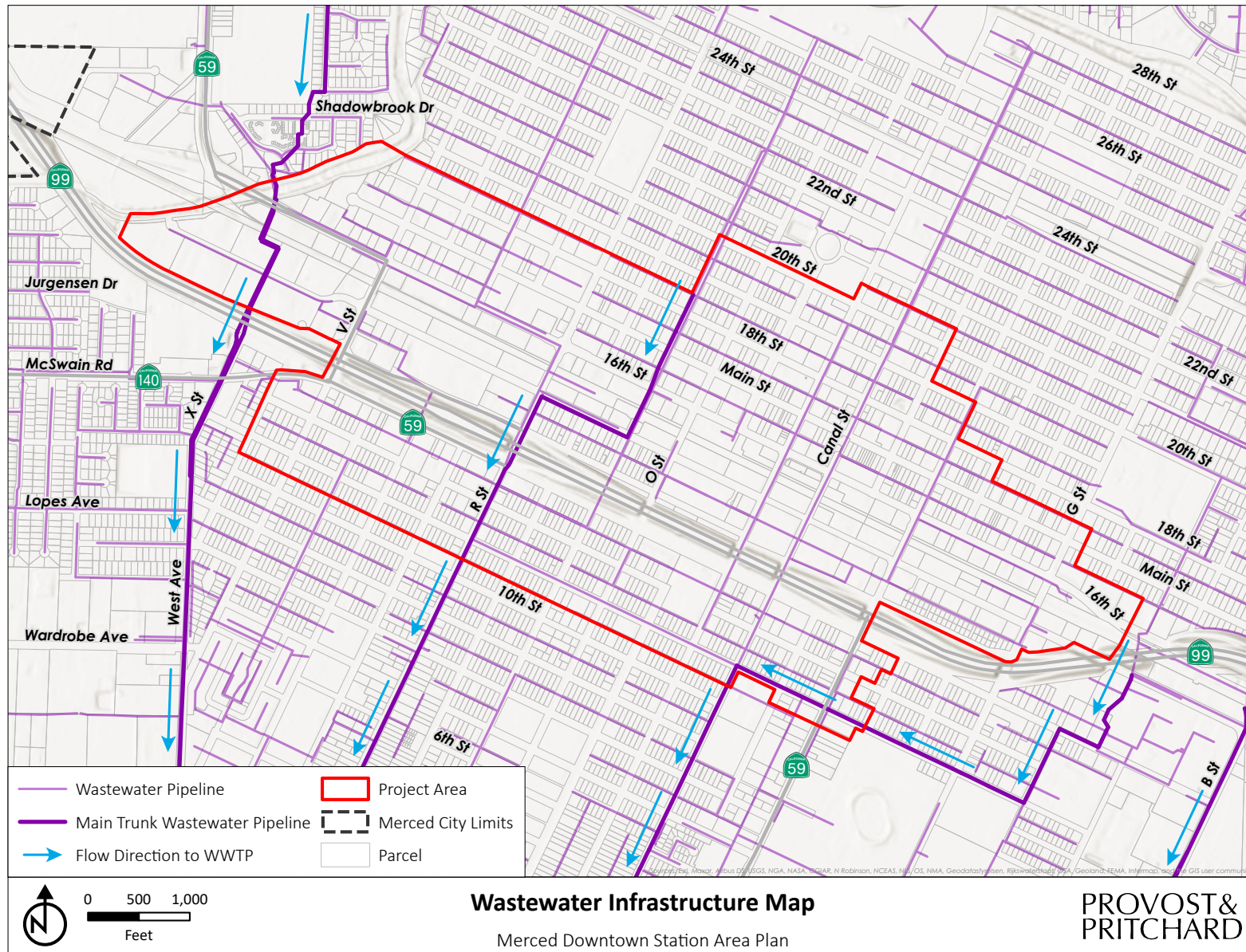
Key considerations related to wastewater for the DSAP include:

- City of Merced provides wastewater service to 83,700 residents.
- Service area is geographically divided into North and South Merced by Bear Creek for the purposes of improvement planning. The DSAP is located south of Bear Creek.
- Intensification of land uses in the DSAP will require improvements to the 48-inch interceptor trunk main to address existing conveyance inefficiencies.
- The WWTF is permitted to capacity of 12.0 mgd, with an expansion planned for treating up to 20.0 mgd. No capacity issues have been identified.

¹⁹ City of Merced Wastewater Collection Master Plan, February 2023, page 40

²⁰ City of Merced UWMP, August 2021, page 6-7

Figure 2: Wastewater Infrastructure



Stormwater

Regulatory Setting and Background

This section outlines federal, State, and local regulations and plans governing storm drainage, also referred to as stormwater management.

Federal

Federal Water Pollution Control Act (Clean Water Act)

The Clean Water Act (CWA) was enacted in 1972 and amended in 1987 to establish the National Stormwater Program, also known as the NPDES Program. The NPDES program regulates three types of point sources that discharge pollutants into waters of the United States: municipal separate storm sewer systems (MS4s), construction activities, and industrial activities.

The NPDES program was established in two phases, incorporating a prioritized approach to stormwater. The Phase I program requires operators of “medium” and “large” MS4s, that is, those that serve populations of 100,000 or greater, to implement a stormwater management program to control polluted system discharges. Stormwater discharges from MS4s in urbanized areas are a concern because storm events in these areas result in runoff that flows over land and impervious surfaces like parking lots, rooftops, and roads, resulting in discharges with a high concentration of pollutants.

The Phase II program is for smaller operators with a population of 50,000 or more that are not covered by Phase I program requirements. The Phase II program encourages the use of general permits, which set limits on what is allowed to be discharged, establish monitoring and reporting requirements, and aim to protect public health.

National Flood Insurance Program and Related Legislation

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), in which participating agencies must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 established a desired level of protection in which development is protected from floodwater damage from an Intermediate Regional Flood (IRF), defined as a 100-year flood.²¹ The 1968 act made federally-subsidized flood insurance available to property owners if their communities participate in the NFIP. A community establishes its eligibility to participate by adopting and enforcing floodplain management measures to regulate new construction and ensuring that substantial improvements within Special Flood Hazard Areas (SFHAs) are designed to eliminate or minimize future flood damage.

An SFHA is an area within a floodplain that has a 1 percent or greater chance of flood occurrence within any given year, which is equivalent to an IRF, and which is often referred to as a 100-year floodplain area. SFHAs are delineated on flood hazard boundary maps issued by FEMA. The Flood Disaster Protection Act

²¹ A 100-year flood is a flood that has an average frequency of occurrence of 100 years, although such a flood may occur in any given year. In other words, a 100-year flood event has a 1 in 100 chance of occurring in any given year.

of 1973 and the National Flood Insurance Reform Act of 1994 make flood insurance mandatory for most properties in SFHAs.

State

This section describes State of California regulations and regulatory agencies. See the **Water Regulatory Setting** section above for a description of the Porter-Cologne Water Quality Control Act, SWRCB, SDWA, and SGMA.

California Stormwater Quality Association

The California Stormwater Quality Association (CASQA) sets BMPs for stormwater quality to achieve sustainable stormwater management throughout the state. The CASQA also advises the SWRCB on the development of stormwater regulations.

Assembly Bill 162

AB 162 requires cities and counties to address flood management in the land use, conservation, safety, and housing elements of their general plans. This ensures that flood management is addressed in general plans in the following ways:

- Requires that areas subject to flooding, as identified by federal and State maps of floodplains, are identified in the land use element for annual review.
- Requires that rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for specified purposes are identified in the conservation element.
- Requires that flood hazard zones are identified and policies to avoid or minimize the unreasonable risks of flooding are established in the safety element.
- Permits areas where the flood management infrastructure is inadequate and housing development is impractical to be excluded from the determination of land suitable for urban development in the housing element analysis.

Local

City of Merced Storm Drain Master Plan (2002)

The City of Merced Storm Drain Master Plan, completed in 2002, provides planning and implementation of drainage infrastructure improvements required to accommodate stormwater runoff under buildout conditions of the City of Merced Vision 2015 General Plan.

Existing Setting

Stormwater Service and Facilities

The City's Public Works Department is responsible for the operation and maintenance of the storm drain collection system.

The City's stormwater system includes approximately 112 miles of underground storm drain lines, 141 acres of detention basins, underground storage infrastructure (e.g., pipelines), pump stations, and open

channels.²² Existing systems are generally undersized, as most storm drain networks lack capacity for 10-year design storm events.²³

Capacity and Flooding

The City has three major storm drain outfall systems that serve the area south of Bear Creek, where the DSAP is located (see **Figure 3**).²⁴ These systems typically only handle between 2-year and 5-year storm events.²⁵ The City divides areas with shared drainage outfalls into local watersheds. The DSAP generally straddles the boundary of watersheds D and E, though a few parcels abutting the eastern boundary of the DSAP are in watershed F.

Watershed D, which encompasses the west portion of the DSAP, is approximately 3.6 square miles and features a mix of residential, commercial, and industrial uses, and is served by a network of storm drains that discharge into Bear Creek at multiple points. Within watershed D, there is a major storm drain system starting near 22nd and S Streets that conveys flow to a detention basin at the west end of Auto Center Drive within the DSAP, where it is released into Bear Creek via a pump station.²⁶

Watershed E, which encompasses the east portion of the DSAP, is approximately 2.4 square miles and is primarily developed with residential uses, though there are a few commercial and industrial uses just north of SR 99. Runoff from this watershed begins south of Bear Creek near 27th Street and Canal Street and flows into a trunk line that extends south along O Street through the DSAP to Childs Avenue, where it continues west along Childs Avenue to West Avenue. The West Avenue outfall serves nearly one half of the City's storm drain system. This system also carries the Merced Irrigation District flows during irrigation season, where a pump station at Riggs Avenue lifts the irrigation water into the adjacent MID Canal. During the non-irrigation season, stormwater in the storm drain system flows into the lower channel owned and operated by the City of Merced.²⁷

Watershed F is primarily comprised of residential and commercial uses within the DSAP. Runoff from this area drains to the G Street storm drain pipeline which discharges into the Zentner Lateral before entering the Hartley Slough near the intersection of Dickenson Ferry Road and the south extension of West Avenue.

The Storm Drain Master Plan identifies that the existing drainpipes within the DSAP do not have the capacity to convey the design flows. The City is planning to add additional pipes to help address the issue. The Storm Drain Master Plan also states that the intersection of M and 21st Streets in the downtown area

²² City of Merced Storm Drains, 2025, <https://www.cityofmerced.gov/utilities-services/water/wastewater-treatment-plants/storm-drains>

²³ City of Merced Storm Drain Master Plan, April 2002, page 5

²⁴ City of Merced Storm Drain Master Plan, April 2002, page 14

²⁵ City of Merced Storm Drain Master Plan, April 2002, page 5

²⁶ City of Merced Storm Drain Master Plan, April 2002, page 7

²⁷ City of Merced Storm Drain Master Plan, April 2002, page 7

is not connected to any downstream system, causing runoff to accumulate and flood the area as water levels rise above the drain inlets.²⁸

Considerations

Key considerations related to stormwater for the DSAP include:

- City of Merced operates the storm drain system.
- There are three major storm drain outfall systems that serve the area south of Bear Creek, where the DSAP is located.
- The DSAP encompasses parts of watersheds D, E, and F.
- Watershed D is served by a network of storm drains that discharge into Bear Creek at multiple points.
- Watershed E is served by the West Avenue storm drain system that serves nearly half the City and discharges seasonally into an adjacent MID Canal or a lower storm drain channel that is owned and operated by the City.
- Watershed F drains to the Zentner Lateral (MID Canal) via the G Street storm drain pipeline before discharging to the Hartley Slough.
- The systems where the DSAP is located are undersized and typically only able to handle 2-year and 5-year storm events.
- There is inadequate piping capacity to convey design flows and additional lines are recommended by the Storm Drain Master Plan.
- The intersection of M and 21st Streets in the vicinity of the DSAP is not connected to any downstream system, causing runoff to accumulate and flood the area as water levels rise above the drain inlets.
- Intensification and buildout of parcels in the DSAP that increase impervious surfaces will increase stormwater runoff, exacerbating existing deficiencies in the storm drain system.
- Climate change is expected to create more frequent and intense rainfall events, potentially exacerbating existing deficiencies in the storm drain system.

²⁸ City of Merced Storm Drain Master Plan, April 2002, page 22

Figure 3: Stormwater Infrastructure

