

4.0 LAND AND WATER USE

The land and water use information presented in this section is a collection of data related to the water and land uses for various human activities, and primarily covers urban and agricultural uses. This information is critical to understanding the setting for this study. The major topics discussed are as follows:

- 4.1 Regional Land Use
- 4.2 Local Land Use
- 4.3 Water Use
- 4.4 Summary

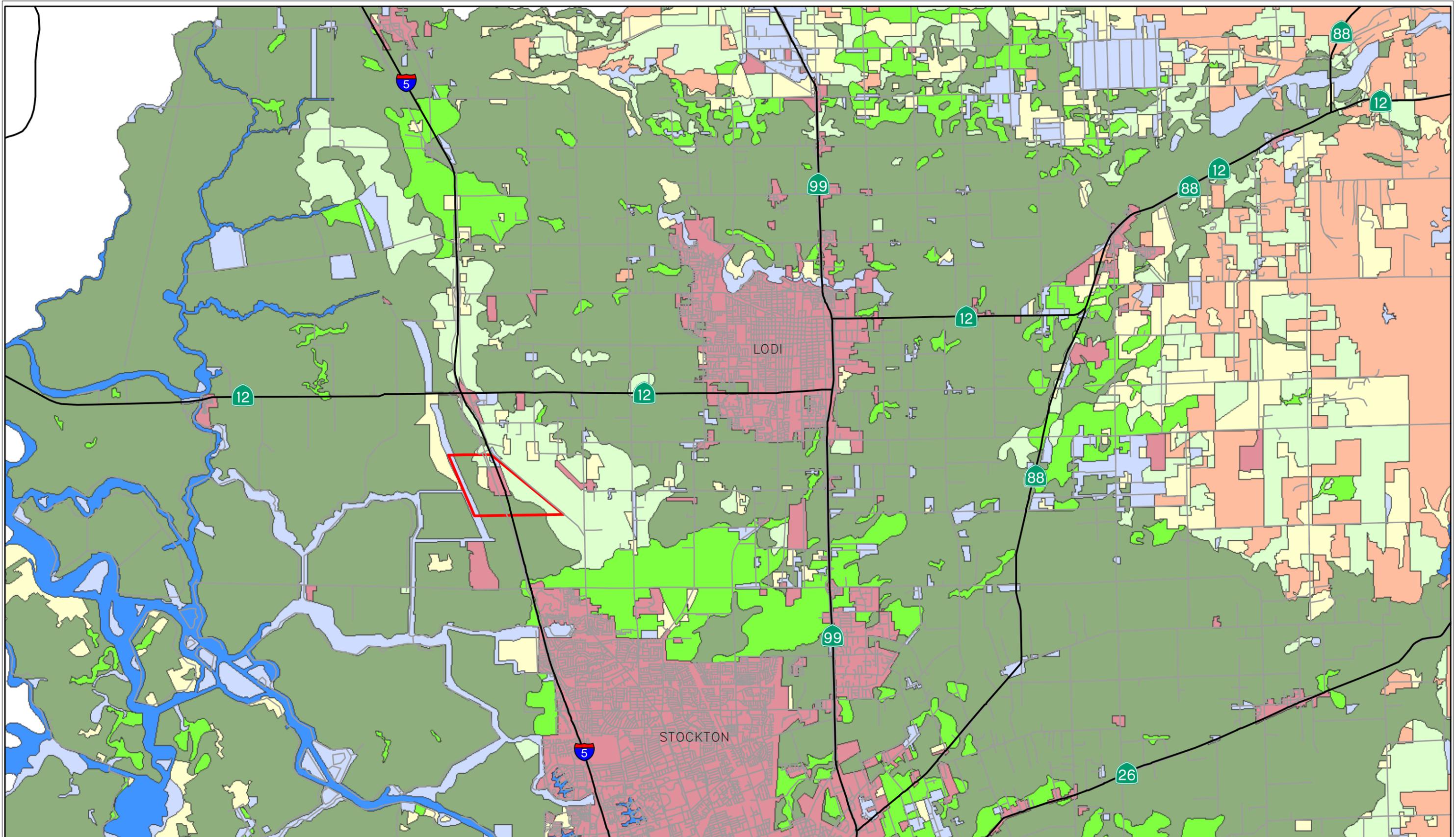
4.1 REGIONAL LAND USE

The regional land use in northwest San Joaquin County is depicted on Figure 4-1. There are two major urban areas in the vicinity of White Slough WPCF. The City of Lodi is located northeast of the facility and the City of Stockton is located to the southeast. There are no major urban areas located to the west of the City's property. There are also five major highways that cross the region shown on Figure 4-1. I-5 and Highway 99 are the two north-south trending highways, while Highway 12 is an east-west trending highway that connects I-5 and Highway 99. Highways 88 and 26 both trend southwest-northeast and connect to Highway 99 at the southern end of Stockton.

The majority of land surround the WPCF site is designated Prime Farmland. Mixed in with the Prime Farmland are small parcels designated Unique Farmland and Farmland of Local Importance. These farmland use designations are established by the State Department of Conservation, and have been identified in the San Joaquin County General Plan. In general, these farmland designations are determined based on soil conditions.

Prime Farmland is land which has the best combination of physical and chemical characteristics or the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods. Farmland of Statewide Importance is land other than Prime Farmland which has a good combination of physical and chemical characteristics for the production of crops. Both Prime Farmland and Farmland of Statewide Importance must have been used for the production of irrigated crops at some time during the two update cycles prior to the mapping date.

Unique Farmland is land which does not meet the criteria for Prime Farmland or Farmland of Statewide Importance, but has still been used for the production of specific high economic value crops at some time during the two update cycles prior to the mapping date. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to current farming methods. Examples of such crops may include oranges, olives, avocados, rice, grapes, and cut flowers.



- | | |
|----------------------|--------------------------|
| Prime Farmland | Grazing |
| Statewide Importance | Urban |
| Unique Farmland | Other |
| Local Importance | Water |
| | Existing City-Owned Land |

Note: Agricultural data provided by San Joaquin County.



Figure 4-1
City of Lodi
White Slough WPCF
Groundwater Investigation
REGIONAL LAND USE

Farmland of Local Importance is land that would otherwise be Prime Farmland, Farmland of Statewide Importance or Unique Farmland but is of some importance to the local economy due to its productivity or value. Such land is typically used for producing crops, has the capability of production, or is used for the production of confined livestock.

4.2 LOCAL LAND USE

As shown on Figure 4-1, the majority of land located immediately west, north, and south of the City-owned property is designated as Prime Farmland. On the City's property, the area designated as Prime Farmland corresponds to the presence of the Guard soils series. The majority of land located to the east of the WPCF is designated as Unique Farmland. In the region near the City's property, the areas designated as Unique Farmland correspond to the presence of the Devries Soil series. A variety of crops are grown on the properties surrounding the WPCF, where the area to the east is used primarily for wine grape production. There are also several wineries and farming residences located in the region surrounding the WPCF.

A small portion of the local land area is designated as Farmland of Local Importance. These land areas include many local dairies; however, the area of local importance that is just west of the existing City-owned lands is the state Department of Water Resources wetland/wildlife area known as the White Slough Wildlife Area.

There are no commercial/urban zoned areas located to the west of the WPCF; however, several small commercial/urban zoning exists to the north, east and south. The designated urban area located to the south of the City-owned lands (but outside the Stockton urban area) is the Spanos Park development, which is a predominantly residential development that includes an 18-hole golf course. The two small strips of designated urban area located to the east of the City-owned lands are the Kingdon Drag Strip and the Lodi Air Park, both of which service small piston-powered air craft. The designated urban area located to the north of the City's property (at the intersection of I-5 and Highway 12) is the Flag City highway service area, which is maintained by San Joaquin County.

In addition to the land use mapping, six aerial photographs of the area surrounding White Slough WPCF were used to evaluate current and historic land use in the area. The photographs were at a scale of approximately 1:24,000 and covered an area roughly thirty square miles surrounding the facility. The years represented by the aerial photographs were 1957, 1963, 1975, 1987, 1999, 2004, and 2006. The primary purpose of the aerial photographs was to locate both past and present confined animal facilities and winery wastewater pond treatment systems located in the vicinity of White Slough WPCF.

In addition, Reports of Waste Discharge for existing dairies in the region of the WPCF were obtained from the Central Valley Regional Water Quality Control Board. These reports contain data about the dairies, including the dairy facility information, size of the operation, and waste production and reuse. The reports also list the county assessor parcel numbers for the dairies as well as the associated land application areas, where both waste liquids and solids are applied.

The locations of the identified winery wastewater pond treatment systems, dairies and associated land application areas identified through this process are shown on Figure 4-2. Note that the land application areas of one of the dairies, Lima Ranch, is contiguous with the northeastern edge of the WPCF land application areas, and the two confined animal facilities associated with this dairy are less than one mile northeast WPCF.

Figure 4-2 also shows the years that these facilities were identified on the historical aerial photographs. In the 1957 photo, there were only two confined animal facilities in the vicinity of the WPCF. By 1963 there were three more confined animal facilities, including one that is just northeast of the WPCF. In the 1975 photograph there were eight identifiable dairies within the study area. Between 1975 and 2006, one new confined animal facility and two winery wastewater pond treatment systems appear to have been constructed.

4.3 WATER USE

The water use in the area of the WPCF, based on information received from DWR, is shown on Figure 4-3. As shown, the WPCF property lies between two distinct regions with respect to water use. To the west of the WPCF property, water use is dominated by surface water and to the east of the WPCF the water use is dominated by groundwater. The WPCF property and the area just east of the property are shown to have a mix of groundwater and surface water use.

4.3.1 Surface Water Use

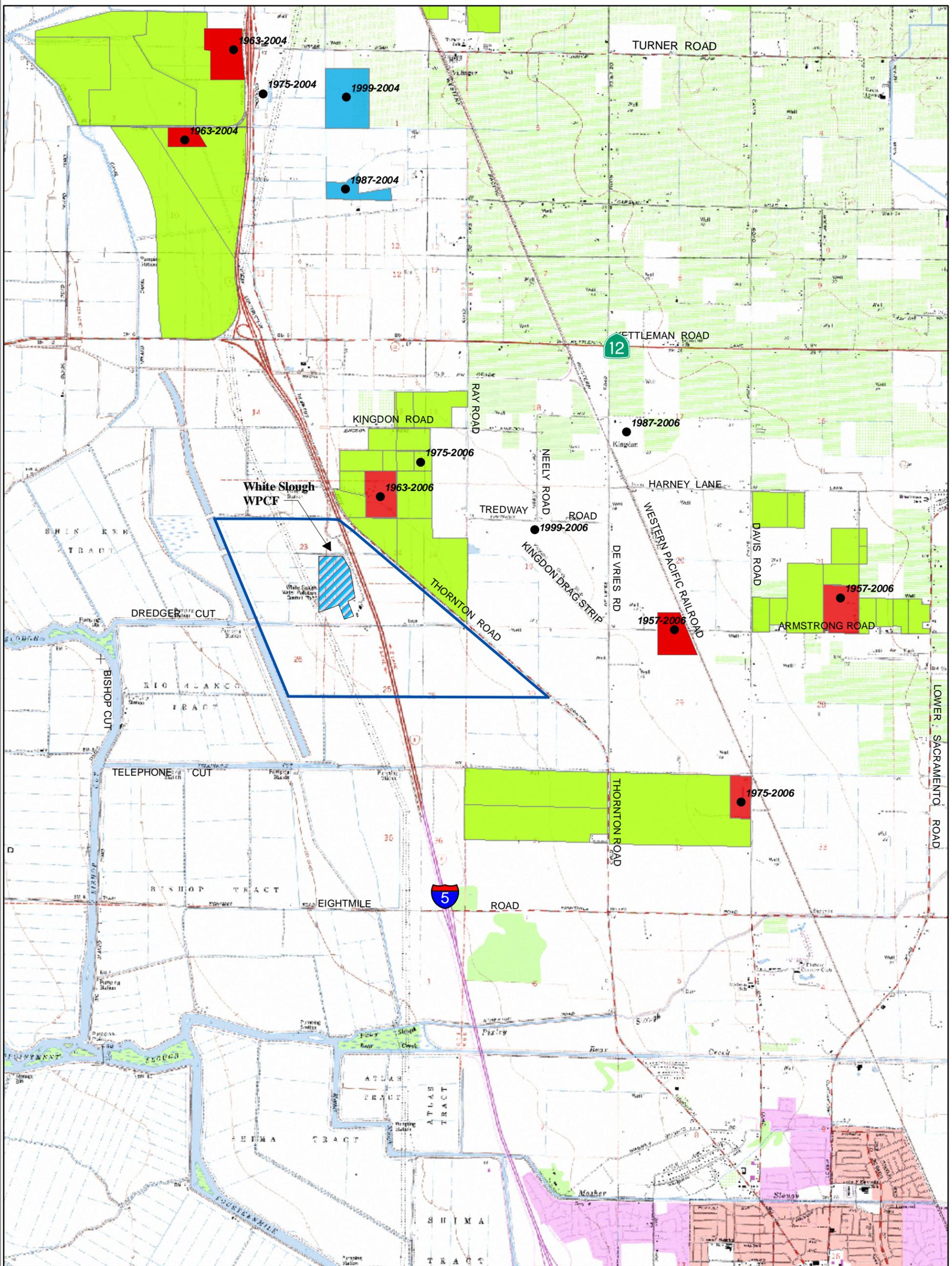
The major surface water feature in the area of the WPCF is the Delta; and, as shown on Figure 4-3 the Delta boundary falls along the eastern boundary of the WPCF property. Generally, agricultural and urban areas located within the Delta Boundary area solely rely on these waters as a supply source.

In addition to Delta waters, the Woodbridge Irrigation District conveys surface water from the Mokelumne River and Delta to many of the irrigated properties located between the WPCF and the City of Lodi. A map of the Woodbridge Irrigation District is provided on Figure 4-4. A comparison of Figures 4-3 to 4-4 shows that not all of the parcels located within the Woodbridge Irrigation District rely on surface water resources; and therefore, are not likely provided with surface water by the District.

4.3.2 Groundwater Use

The groundwater wells located within a two mile radius of the WPCF, as provided by DWR, are shown on Figure 4-5. Hydrographs for the supply wells shown on this figure are provided in Appendix A. The majority of the wells are to the east of the facility where surface water is not as abundant as it is in the Delta region. This is also the direction of the overall regional groundwater gradient.

As discussed in Section 3.6 the localized groundwater flow is primarily to the northeast during the irrigation season (when groundwater pumping to the east is the greatest). As shown on Figure 4-5, there are a significant number of wells located northeast of the WPCF property, and the local gradient is likely due to pumping in these wells. Therefore, the wells located to the northeast of the WPCF property are of concern with respect to potential degradation as a result of the City's activities at the WPCF site.



- 1957-2004 Confined Animal Facility Identified by Aerial Photography (Dates Indicate Aerial Photographic Coverage)
- Dairy Land Application Area Identified through Report of Waste Discharge Investigation
- Confined Animal Facility Identified through Report of Waste Discharge Investigation
- 1957-2004 Winery Wastewater Treatment Pond Identified by Aerial Photography (Dates Indicate Aerial Photographic Coverage)
- ▭ Existing City-Owned Land

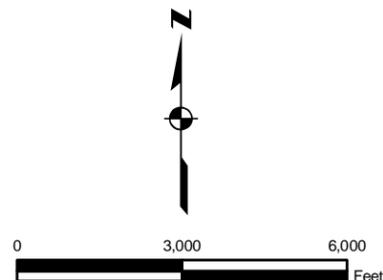
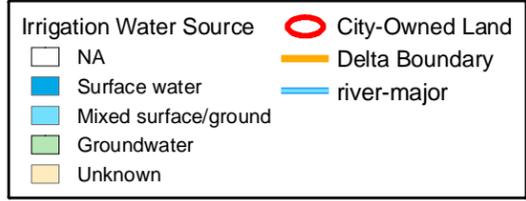
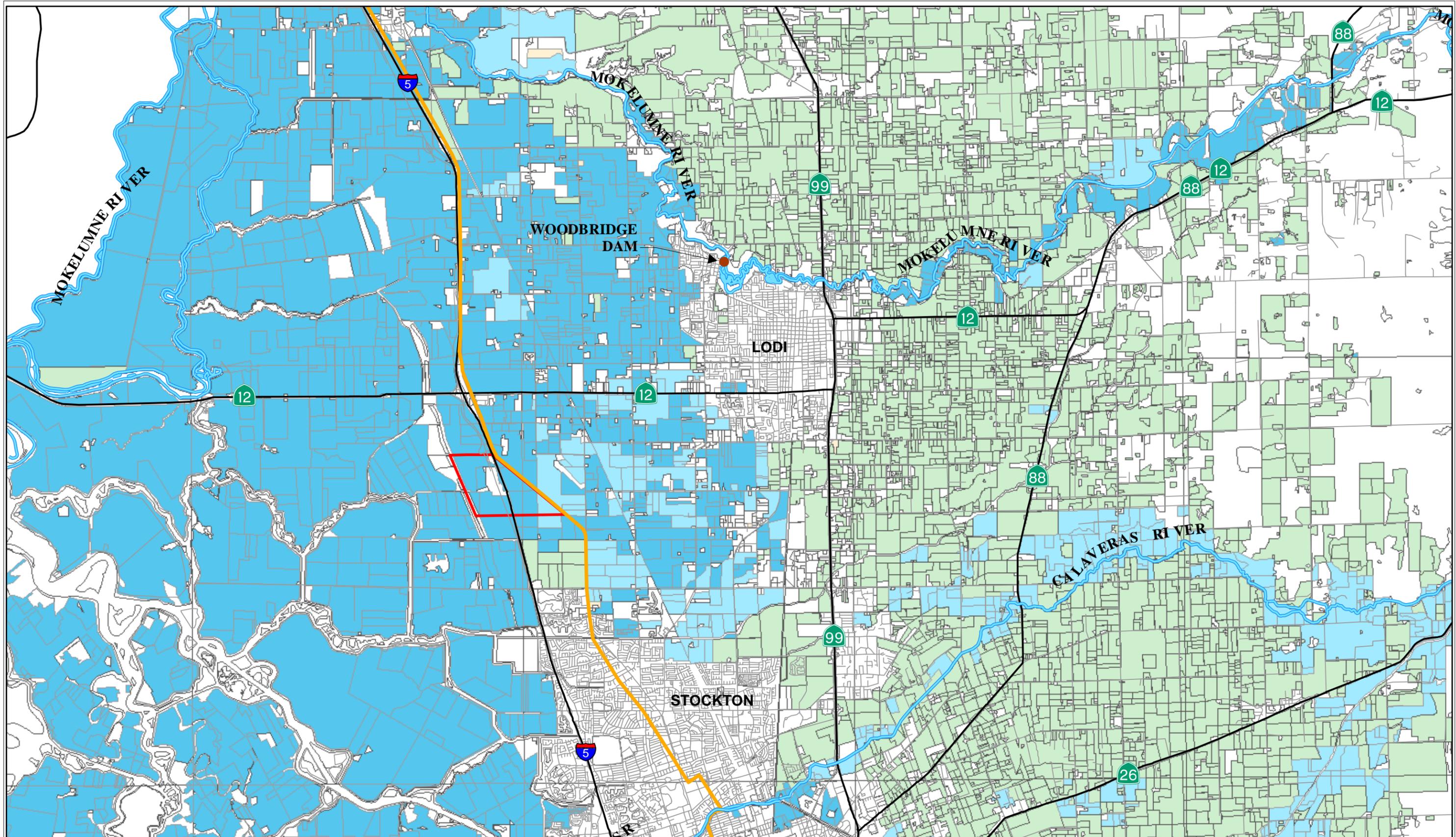


Figure 4-2
City of Lodi
White Slough WPCF
Groundwater Investigation
SPECIFIC LAND USES IN THE
VICINITY OF THE LODI WPCF



Note: Data from Calif. Department of Water Resources, 1996 San Joaquin County Land Use Survey.

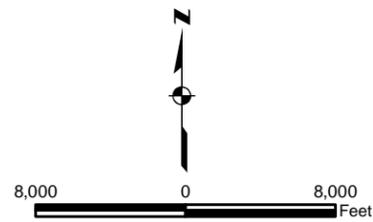
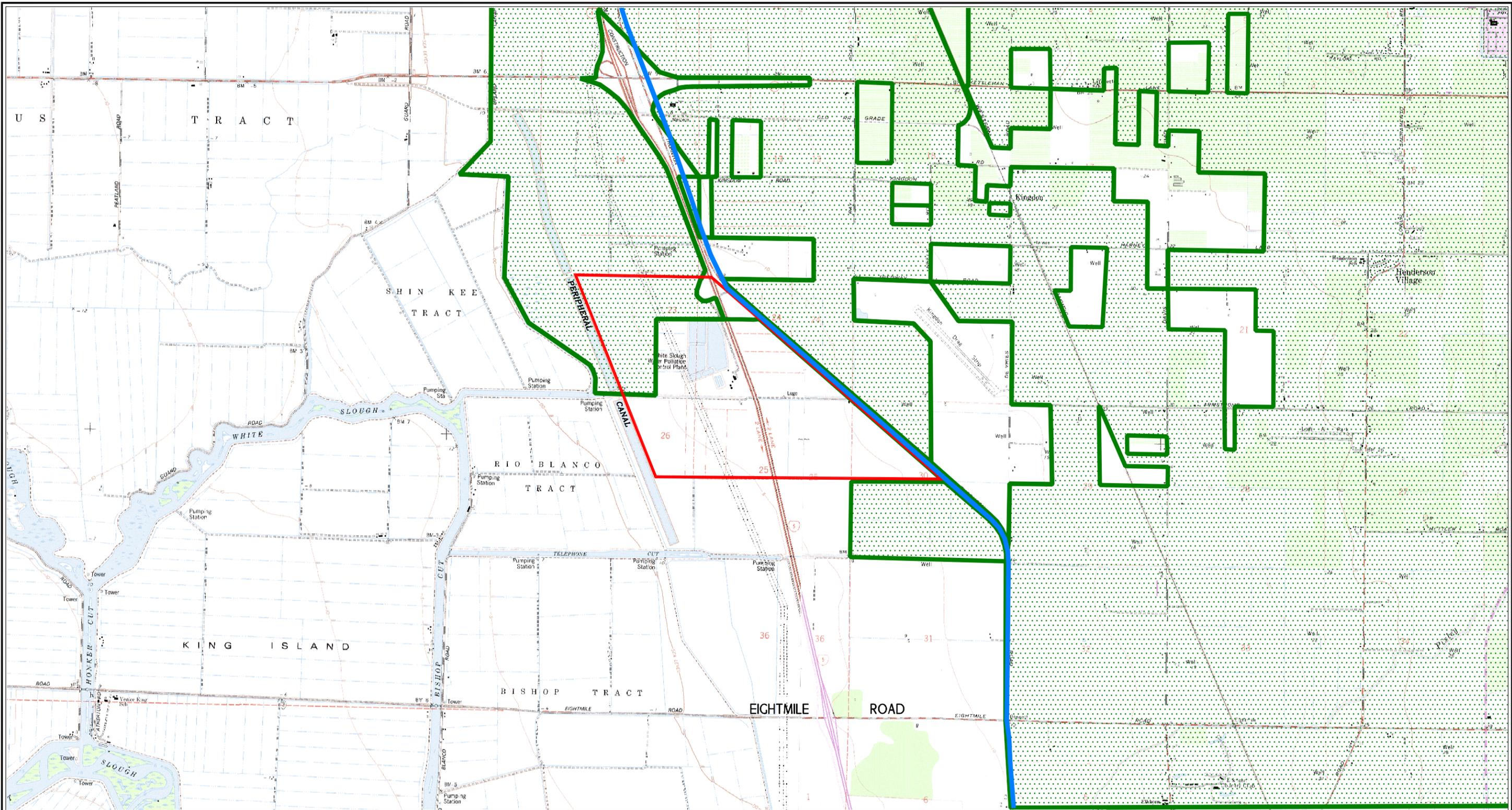


Figure 4-3
City of Lodi
White Slough WPCF
Groundwater Investigation
WATER USE MAP

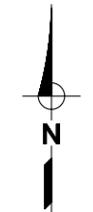


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LEGEND

-  WOODBRIDGE IRRIGATION DISTRICT
-  DELTA BOUNDARY
-  CITY OWNED PROPERTY

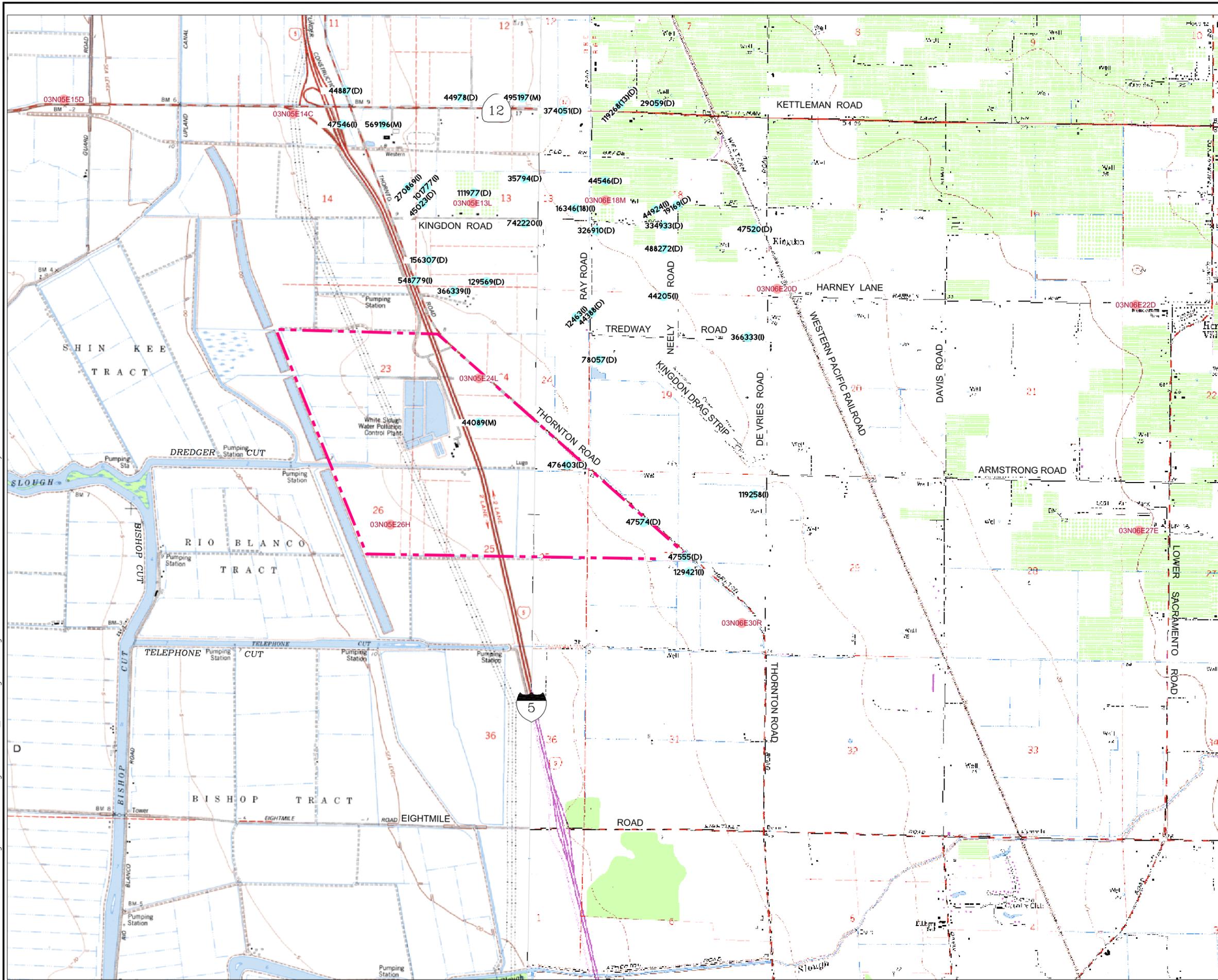


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SCALE IN FEET

Figure 4-4
City of Lodi
White Slough WPCF
Groundwater Investigation
WOODBRIDGE IRRIGATION
DISTRICT



Figure 4-5
City of Lodi
White Slough WPCF
Groundwater Investigation
SUPPLY WELL
LOCATION MAP



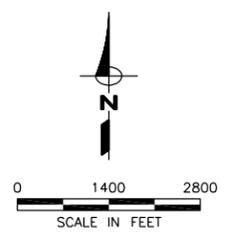
LEGEND

- 03N06E20D WELL WITH HYDROGRAPH FROM DWR WATER DATA LIBRARY
- 47555(D) WELL WITH DWR DRILLERS REPORT
- - - - EXISTING CITY-OWNED LAND

NOTES

WELL IDENTIFICATION

- (I) Irrigation
- (D) Domestic
- (M) Municipal or Industrial



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There is also some southwesterly flow that occurs from beneath the southwestern corner of the agricultural reuse area. However, the potential for transport in this direction is probably minor due to the relative small size of the affected agricultural reuse area and the relatively low hydraulic gradient. Nevertheless, the wells located to the southeast of the WPCF are also a concern for potential degradation. The three main types of wells in the area are irrigation, domestic, and municipal/industrial. Irrigation wells make up 35% of the wells shown, domestic wells make up 57%, and municipal/industrial wells make up the final 8%.

4.4 SUMMARY

The available land and water use information was used to evaluate the land and water use patterns in the vicinity of the City's property. In combination with the environmental setting discussion presented in Section 3.0, this information provides the foundation for assessing the groundwater in the vicinity of the WPCF.

4.4.1 Land Use

The area surrounding the WPCF property is dominated by agriculture. However, in the agricultural areas located to the east of the City's property, land surface elevations are higher, the depth to groundwater is greater and the soils are better drained. This condition allows for the production of wine grapes in this area.

Most dairy operations are also active to the east of the WPCF. There is a major dairy operation adjacent to the northeast edge of the WPCF. There are no significant dairies located to the west of the City's property. This could be due to the fact that the elevated groundwater levels and potential for flooding to the west lead to unfavorable conditions for holding large number of cattle.

There is little to no urban development in the region located to the west of the WPCF property. This is likely due to the fact that this area is both located within the floodplain of the Delta and groundwater elevations are near the ground surface. Both of the factors would create a situation where development of this type would be difficult without significant flood and groundwater control.

4.4.2 Water Use

The Delta boundary transects the WPCF site, which delineates two distinct regions that can be characterized by significantly different water use. Delta lands are predominately irrigated with surface water, while lands to the east of the Delta are irrigated with surface water or groundwater (depending on the proximity of such lands to a riverine source of water).

Most water use in the area west of the City's property is met by Delta water supplies. In addition, the Woodbridge Irrigation District conveys surface water from the Mokelumne River to many of the irrigated properties located between the WPCF and the City of Lodi, particularly to lands located to the northeast of the WPCF. To the east, southeast and south of the WPCF most water use is provided by groundwater resources. This difference in water use affects the groundwater elevations (or depth to groundwater) in these regions.