

## 4.10 HYDROLOGY AND WATER QUALITY

This section describes the regulatory framework and existing conditions within the Specific Plan Area and the potential impacts on hydrology and water quality resulting from implementation of the proposed Specific Plan.

Information in this section is based in part on the following documents:

- City of Madera General Plan Update/Environmental Impact Report, May 2009
- City of Madera General Plan, October 7, 2009
- Madera Regional Groundwater Management Plan, December 2014
- Madera Subbasin Sustainable Groundwater Management Act (SGMA) Joint Groundwater Sustainability Plan, January 2020
- Madera County Local Hazard Mitigation Plan Update (LHMP), October 2017
- Madera County Storm Water Resource Plan (SWRP), December 2017
- Village D Specific Plan Infrastructure Master Plan, January 2020

### 4.10.1 Environmental Setting

#### 4.10.1.1 Surface Water and Drainage

**Regional Drainage.** The proposed Specific Plan resides within the San Joaquin River Watershed which covers approximately 15,600 square miles.<sup>1</sup> The San Joaquin River Watershed is between the Sacramento River Watershed to the north, and the Tulare Basin Watershed to the south, and extends from the Sierra Nevada Mountains to the east to the Coast Range Mountains to the west. Water primarily flows west from the Sierra Nevada Mountains from Sierra Nevada into the San Joaquin Valley then diverts north to join the Sacramento River. Several tributary rivers (from south to north: Fresno, Chowchilla, Merced, Tuolumne, Stanislaus, Calaveras, Mokelumne, and Cosumnes Rivers) within the watershed travel from the Sierra Nevada Mountains, and ultimately terminate within the San Joaquin River system.<sup>2</sup> Natural water flow within the tributary rivers has been substantially modified by dams and diversions, or canal structures.

The San Joaquin Watershed is divided into six subbasins;<sup>3</sup> the Specific Plan Area is in the Madera Subbasin which spans approximately 543 square miles.<sup>4</sup> The Madera Subbasin is bounded in the south by the San Joaquin River and the Kings Subbasin, in the west by the Delta-Mendota Subbasin, in the north by the Chowchilla Subbasin, and in the east by the foothills of the Sierra Nevada.<sup>5</sup> The

<sup>1</sup> United States Environmental Protection Agency. SF-Bay Delta and Associated Watersheds. Website: [www.epa.gov/sfbay-delta/about-watershed](http://www.epa.gov/sfbay-delta/about-watershed) (accessed February 23, 2020).

<sup>2</sup> Ibid.

<sup>3</sup> State Water Resources Control Board Surface Water Ambient Monitoring Program. Website: [www.waterboards.ca.gov/centralvalley/water\\_issues/swamp/sanjoaquin\\_river\\_basin](http://www.waterboards.ca.gov/centralvalley/water_issues/swamp/sanjoaquin_river_basin) (accessed February 24, 2020).

<sup>4</sup> Davids Engineering, Inc., et. al. 2020. Madera Subbasin Sustainable Groundwater Management Act, *Joint Groundwater Sustainability Plan*. Available online at: [www.maderacountywater.com/wp-content/uploads/2020/02/Madera\\_GSP\\_2020\\_FinalReport.pdf](http://www.maderacountywater.com/wp-content/uploads/2020/02/Madera_GSP_2020_FinalReport.pdf) (accessed April 28, 2020).

<sup>5</sup> Ibid.

Madera Subbasin encompasses the entire City of Madera, and most of Madera County.<sup>6</sup> Primary surface water bodies within the Madera Subbasin include Berenda Creek, Dry Creek, Fresno River, Cottonwood Creek, San Joaquin River, and Madera Lake.<sup>7</sup> Major reservoirs within the watersheds upstream of the Madera Subbasin include Hensley Lake, along the Fresno River and Millerton Lake along the San Joaquin River.<sup>8</sup>

Hensley Lake and Millerton Lake are reservoirs impounded behind Hidden Dam and Friant Dam, respectively. Both dams were built to supply irrigation and municipal water and provide flood control.<sup>9,10</sup> Hidden Dam is approximately 12 miles northeast of the Specific Plan Area, while Friant Dam is approximately 23 miles east-northeast from the Specific Plan Area. Other flood control channels within the Madera Subbasin include the Chowchilla Bypass, Madera Canal Diversions, and Gravelly Ford Canal.<sup>11</sup>

**Local Surface Waters and Drainage.** The Fresno River is the major natural drainage channel for the City of Madera and is relatively dry throughout most of the year due to controlled flow of the Hidden Dam and Madera Lake Dam. The City of Madera is relatively flat; thus, the predominant method of runoff disposal is through the use of retention basins which recharge groundwater.<sup>12</sup> Runoff disposal, or stormwater collection begins in the storm drains which convey runoff to storm drain inlets. Runoff from these drains travel to retention basins within the City and recharges groundwater in the Madera Subbasin. The City of Madera's Public Works Department maintains the streets, storm drains, and sidewalks, associated with stormwater discharge.<sup>13</sup> Stormwater collected into retention basins slowly recharges groundwater. If another storm occurs and the basin is over capacity, the excess water is relieved and discharges into the San Joaquin River along with the tributaries and irrigation canals.

### **Surface Water Uses**

**Municipal Use.** The City of Madera stores treated effluent water from the Wastewater Treatment Plant (WWTP) in percolation ponds to recharge groundwater. Wastewater collected in sanitary sewers is treated through a primary and secondary process which involves screening, grit removal, sedimentation, activated sludge process, and final clarification. There are approximately 12,800 residential and 1,000 commercial/industrial

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<sup>6</sup> Madera, County of. Water and Natural Resources, SGMA Subbasins. Website: [www.maderacountywater.com/subbasins](http://www.maderacountywater.com/subbasins) (accessed February 24, 2020).

<sup>7</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

<sup>8</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

<sup>9</sup> United States Bureau of Reclamation. Friant Division Project. Website: [www.usbr.gov/projects/index.php?id=341](http://www.usbr.gov/projects/index.php?id=341) (accessed February 25, 2020).

<sup>10</sup> United States Army Corps of Engineers, Sacramento Division. 2017. *Hidden Dam–Hensley Lake Project Master Plan Update Fact Sheet*. Available online at: [www.spk.usace.army.mil/Portals/12/documents/parks\\_lakes/Hensley/Hensley\\_Public\\_Input\\_Form.pdf?ver=2017-07-05-183434-983](http://www.spk.usace.army.mil/Portals/12/documents/parks_lakes/Hensley/Hensley_Public_Input_Form.pdf?ver=2017-07-05-183434-983) (accessed April 28, 2020). July.

<sup>11</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

<sup>12</sup> Provost and Pritchard Consulting Group. 2017. *Draft Urban Water Management Plan 2015 Update* for the City of Madera. Available online at: [www.madera.gov/wp-content/uploads/2017/03/2015-Madera-UWMP-Draft-1.pdf](http://www.madera.gov/wp-content/uploads/2017/03/2015-Madera-UWMP-Draft-1.pdf) (accessed April 28, 2020). March.

<sup>13</sup> Madera, City of. Streets, Storm Drainage. Website: [www.madera.gov/home/departments/public-works/streets/#tr-storm-drainage-239604](http://www.madera.gov/home/departments/public-works/streets/#tr-storm-drainage-239604) (accessed February 26, 2020).

sewer connections that lead to the WWTP. In 2015, 16,503 million gallons were collected and treated.<sup>14</sup>

**Agricultural Irrigation.** The Madera Irrigation District (MID) encompasses an area of 139,665 acres within Madera County and is centered on the City of Madera, receiving surface water from the Madera Canal, a long aqueduct part of the Central Valley Project (CVP), and managed by the United States Bureau of Reclamation (USBR). The CVP serves farms, homes, and industries within the Central Valley.<sup>15</sup> The Madera Canal receives water from various tributaries, such as the Fresno River and the San Joaquin River. The Madera Subbasin received an average amount of 211,156 acre-feet for surface water received from the CVP, and 214,643 acre-feet from tributaries and riparian deliveries from 1989 to 2014.<sup>16</sup>

**Surface Water Quality.** The State Water Resources Control Board (SWRCB) assesses and lists impaired water bodies within the State of California under the Clean Water Act Section 303(d). The Fresno River is the only surface water body that passes through the City of Madera and the Specific Plan Area. The Fresno River supports aquatic life.<sup>17</sup>

## Groundwater

**Groundwater Supplies and Uses.** The City of Madera receives potable water supplies exclusively from groundwater through 18 active wells that pump from the regional groundwater supply to meet demand. In March 2017, the City of Madera adopted the Urban Water Management Plan to address water emergencies, and manage potable water supplies.

The Madera Subbasin has been categorized as a critically over drafted basin as groundwater has been extracted out of the subbasin faster than water can recharge back into the subbasin. Under California's SGMA, the Madera Subbasin and affiliated Groundwater Sustainability Agencies (GSAs) within the subbasin have defined and provided groundwater conditions and have set a standard to maintain/achieve sustainable groundwater management within the subbasin. This information has been submitted as a Groundwater Sustainability Plan (GSP) to the Department of Water Resources (DWR) on January 31, 2020. These standards must be approved by DWR and then achieved within 20 years of adopting the GSP.<sup>18</sup>

**Groundwater Recharge.** Regionally, the subbasin is recharged with stream flow percolation from nearby rivers (San Joaquin River, Chowchilla River, and Fresno River), creeks and sloughs, infiltration and precipitation on the Valley floor, subsurface inflow, and seepage from unlined canals.

The City of Madera recharges groundwater with small quantities of surface water from the MID and by retaining stormwater in stormwater basins without compromising capacity for flood

<sup>14</sup> Provost and Pritchard Consulting Group. 2017, op. cit.

<sup>15</sup> United States Bureau of Reclamation. Central Valley Project. Website: [www.usbr.gov/projects/index.php?id=506](http://www.usbr.gov/projects/index.php?id=506) (accessed February 27, 2020).

<sup>16</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

<sup>17</sup> State Water Resources Control Board. 2012. Impaired Water Bodies. Website: [www.waterboards.ca.gov/water\\_issues/programs/tmdl/integrated2012.shtml](http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml) (accessed February 27, 2020).

<sup>18</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

protection.<sup>19</sup> The volume of stormwater that recharges the City of Madera is not available. Additionally, treated effluent water from the City's WWTP is disposed through on-site percolation ponds which also help recharge the City.

**Groundwater Quality.** The Madera Subbasin generally has high-quality water. According to the 2017 Urban Waste Management Plan, the Madera Subbasin has generally acceptable concentrations of arsenic (below the maximum contaminant level (MCL) of 10 micrograms per liter ( $\mu\text{g/L}$ )), total dissolved solids, or TDS (concentrations are generally acceptable within the Madera area with the exception of several wells in the western portion with elevated concentrations of over 1,000 milligrams per liter ( $\text{mg/L}$ )), and nitrate as  $\text{NO}_3$  (under the MCL of 45  $\text{mg/L}$ , with the exception of an area southwest of the City of Madera where land use may be potentially affecting the shallow aquifer water quality).<sup>20</sup>

The average TDS of the subbasin is 215  $\text{mg/L}$ <sup>21</sup> with increasing TDS from east to west across the subbasin.<sup>22</sup> Higher TDS concentrations found within the subbasin may be caused by the natural salinity present in groundwater occurring within marine-sourced sediments derived from the Coast Range.<sup>23</sup> Nitrate within the subbasin have more commonly higher concentrations in the western parts of the subbasin. Some of the higher concentrations of nitrate in the area are known to be associated with regulated facilities and contamination remediation sites.<sup>24</sup> Higher concentrations of arsenic are scattered throughout the subbasin but are more common in the eastern part of the subbasin.

Other constituents of particular concern within the Madera Subbasin are 1,2-Dibromo-3-chloropropane (DBCP), 1,2-Dibromoethane (EDB), 1,2,3-Trichloropropane (1,2,3-TCP), perchlorate, Tetrachloroethylene (PCE), and Benzene, Toluene, Ethylbenzene, Xylenes (BTEX). The varieties of constituents are generally anthropogenic contaminants like pesticides, solvents, and petroleum-related chemicals.<sup>25</sup>

DBCP and EDB have had localized issues within the City of Madera and are being treated with a granular activated carbon (GAC) treatment system. Manganese also has a presence in the City of Madera and is being treated as well. These localized issues were discussed in the City of Madera General Plan Update/Draft Environmental Impact Report dated May 2009.<sup>26</sup>

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<sup>19</sup> Provost and Pritchard Consulting Group. 2017, op. cit.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

<sup>23</sup> Ibid.

<sup>24</sup> Ibid.

<sup>25</sup> Ibid.

<sup>26</sup> Madera, City of. 2009. *General Plan Update/Draft Environmental Impact Report*. Updated May 2009.

## Flood Control

**Flood Zones.** The Specific Plan Area is located on Flood Insurance Rate Maps (FIRMs)<sup>27</sup> under FIRM Panels 06039C1150E and 06039C1155E. As shown in Figure 4.10-1, the majority of Specific Plan Area's eastern portion is classified as "Zone X",<sup>28</sup> except for the southern border of the Specific Plan Area along the Fresno River. Approximately 675 acres of the Specific Plan Area is within Zone X which has been determined to be outside the 500-year flood plain. This area is protected by levees from 200-year flood and is considered as a moderate flood risk area.<sup>29</sup> The western portion of the Specific Plan Area is classified as "Zone AO" which covers approximately 1,169 acres of the Specific Plan Area.<sup>30</sup> Zone AO is considered a high risk area because this zone designation is subject to inundation with a one-percent or greater chance for shallow flooding (1-3 feet) to occur each year.<sup>31</sup> The southern border of the Specific Plan Area along the Fresno River is classified as "Zone A" and covers approximately 53 acres of the Specific Plan Area.<sup>32</sup> Zone A areas are also considered high risk as they are subject to inundation by a one-percent-annual-chance flood event and have not determined Base Flood Elevations (BFEs), which require a hydraulic analyses to determine flood depths.<sup>33</sup> The Fresno River is dry throughout most of the year unless there has been a water release from upstream agencies.<sup>34</sup>

Levees. Although there are numerous levee systems within Madera County, none of the levees are accredited by the Federal Emergency Management Agency (FEMA) as providing protection against a 100-year flood.<sup>35</sup> There have been no reported disaster declarations related to levy failure in Madera County.

According to Madera County's Local Hazard Mitigation Plan (LHMP), there have been at least seven sites of seepage (boils) within the Fresno River levee in 2010-2011. Damage was temporarily alleviated with boil sack rings in affected areas. A \$2.5 million-dollar grant was obtained by the County to repair these critical sites.<sup>36</sup> The Fresno River borders the southern portion of the Specific Plan Area.

<sup>27</sup> Federal Emergency Management Agency. Flood Map Service Center. Website: [msc.fema.gov/portal/search?AddressQuery=madera%2C%20california#searchresultsanchor](https://msc.fema.gov/portal/search?AddressQuery=madera%2C%20california#searchresultsanchor) (accessed February 26, 2020).

<sup>28</sup> Federal Emergency Management Agency. National Flood Hazard Layer Viewer. Website: [hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd](https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd) (accessed February 25, 2020).

<sup>29</sup> Federal Emergency Management Agency. Definitions of FEMA Flood Zone Definitions. Available online at: [snmapmod.snco.us/fmm/document/fema-flood-zone-definitions.pdf](https://snmapmod.snco.us/fmm/document/fema-flood-zone-definitions.pdf) (accessed February 26, 2020).

<sup>30</sup> Federal Emergency Management Agency, National Flood Hazard Layer Viewer, op. cit.

<sup>31</sup> Federal Emergency Management Agency. Definitions of FEMA Flood Zone Definitions, op. cit.

<sup>32</sup> Federal Emergency Management Agency, National Flood Hazard Layer Viewer, op. cit.

<sup>33</sup> Federal Emergency Management Agency. 2012. *The Zone A Manual: Managing Floodplain Development in Approximate Zone A Areas*. Website: [www.fema.gov/media-library/assets/documents/7273](https://www.fema.gov/media-library/assets/documents/7273) (accessed February 26, 2020). March 2.

<sup>34</sup> Madera, City of. 2009, op. cit.

<sup>35</sup> Madera, County of. 2017. *Madera County Local Hazard Mitigation Plan Update*. Available online at: [www.madera.gov/wp-content/uploads/2018/09/Madera-County-Local-Hazard-Mitigation-Plan-2018.pdf](https://www.madera.gov/wp-content/uploads/2018/09/Madera-County-Local-Hazard-Mitigation-Plan-2018.pdf) (accessed February 26, 2020). October.

<sup>36</sup> Ibid.

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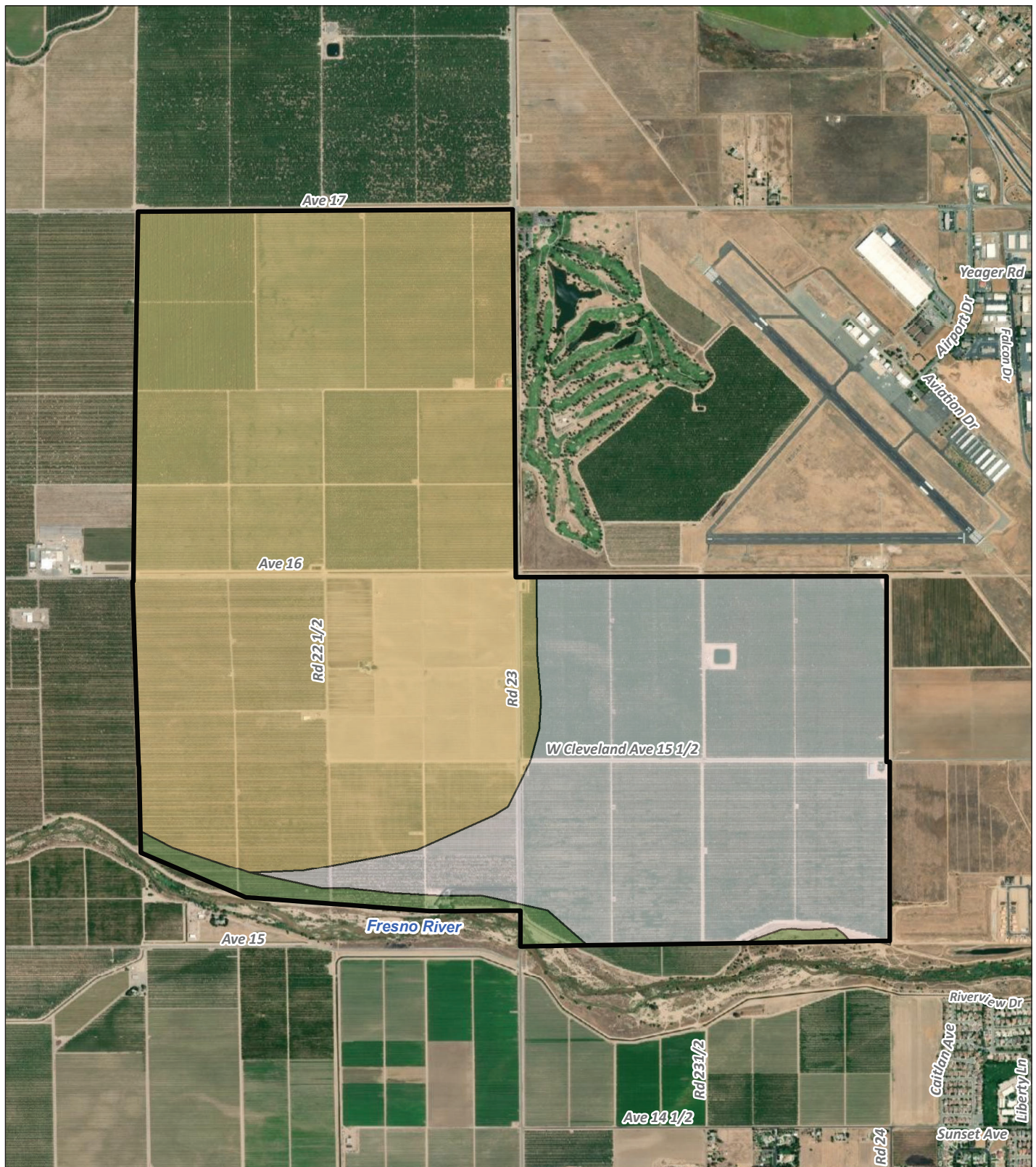



FIGURE 4.10-1


LSA

 Project Area

Flood Zones

 **A (45.59 acres)**

No Base Flood Elevations determined.

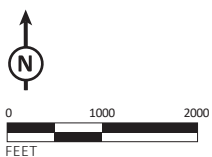
 **AO (1,169.35 acres)**

Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

 **X (664.51 acres)**

Other flood areas. Areas of 0.2% chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

*The Villages at Almond Grove  
Specific Plan EIR  
Flood Zones*



SOURCES: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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**Dam Inundation.** The DWR, Division of Safety of Dams reviews and publishes dam breach inundation maps prepared by licensed civil engineers and submitted by dam owners indicating risk hazards associated with dam inundation.<sup>37</sup> The hazards scale ranges from four rankings: low, significant, high, and extremely high.

Madera Lake Dam,<sup>38</sup> owned by the MID is the only dam within the Madera Subbasin included as an inundation hazard and has a high downstream hazard risk. The Madera Lake Dam is relatively small and is 7.75 miles northeast from the Specific Plan Area and is located on the Fresno River. The inundation boundary follows the Fresno River, passing through the City of Madera and terminates a few feet away from the intersecting Chowchilla bypass. The Madera Lake Dam inundation boundary follows the southern border of the Specific Plan Area but does not cross into the Site as shown in Figure 4.10-2. Madera Lake dam is an earthen embankment with a reservoir capacity of 2,300 acre-feet and was built in 1958. In the event of inundation, bridges along the Fresno River path are not expected to be overtopped. Saddle dams exist at Madera Lake to prevent inundation and excess water is diverted along the John Franchi Diversion Dam.<sup>39</sup>

In addition to the Madera Lake Dam, three major dams also have the potential to inundate portions of Madera County if they were to fail: Friant Dam on the San Joaquin River, Buchanan Dam on the Chowchilla River, and Hidden Dam on the Fresno River, just upstream of the Madera Dam. If the Hidden Dam fails, the City of Madera, the Specific Plan Area, and the surrounding area of 132 square miles within Madera County would directly be impacted.<sup>40</sup> The inundation boundary for the Hidden Dam is shown on Figure 4.10-2 and covers most of the Specific Plan Area. Approximately 207 acres of the northern portion of the Specific Plan Area are not within the Hidden Dam inundation boundary. The Hidden Dam is an earth-fill dam at a height of 184 feet and capacity of 90,000 acre-feet.<sup>41</sup>

**Seiche.** Seiches are surface waves with longer period of water-level oscillations within a lake, bay, or estuary typically caused by earthquakes, wind, or changes in atmospheric pressure.<sup>42</sup> Once the forces stop, water rebounds to the other side of the enclosed area and oscillates back and forth for a given amount of time (typically hours) based on the size and volume of the water body. The nearest water body to the Specific Plan Area capable of generating a seiche is Madera Lake. The potential for failure of Madera Lake Dam is addressed above under *Dam Inundation*.

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<sup>37</sup> California Department of Water Resources. Division of Safety of Dams. California Dam Breach Inundation Maps. Website: [fmds.water.ca.gov/maps/damim](https://fmds.water.ca.gov/maps/damim) (accessed February 26, 2020).

<sup>38</sup> California Department of Water Resources. 2017. Division of Safety of Dams. *Dams Within Jurisdiction of the State of California, National ID no. CA00027; Dam Number 682.000*. Available online at: [water.ca.gov/LegacyFiles/damsafety/docs/Dams%20by%20Dam%20Name\\_Sept%202017.pdf](https://water.ca.gov/LegacyFiles/damsafety/docs/Dams%20by%20Dam%20Name_Sept%202017.pdf) (accessed February 25, 2020). September.

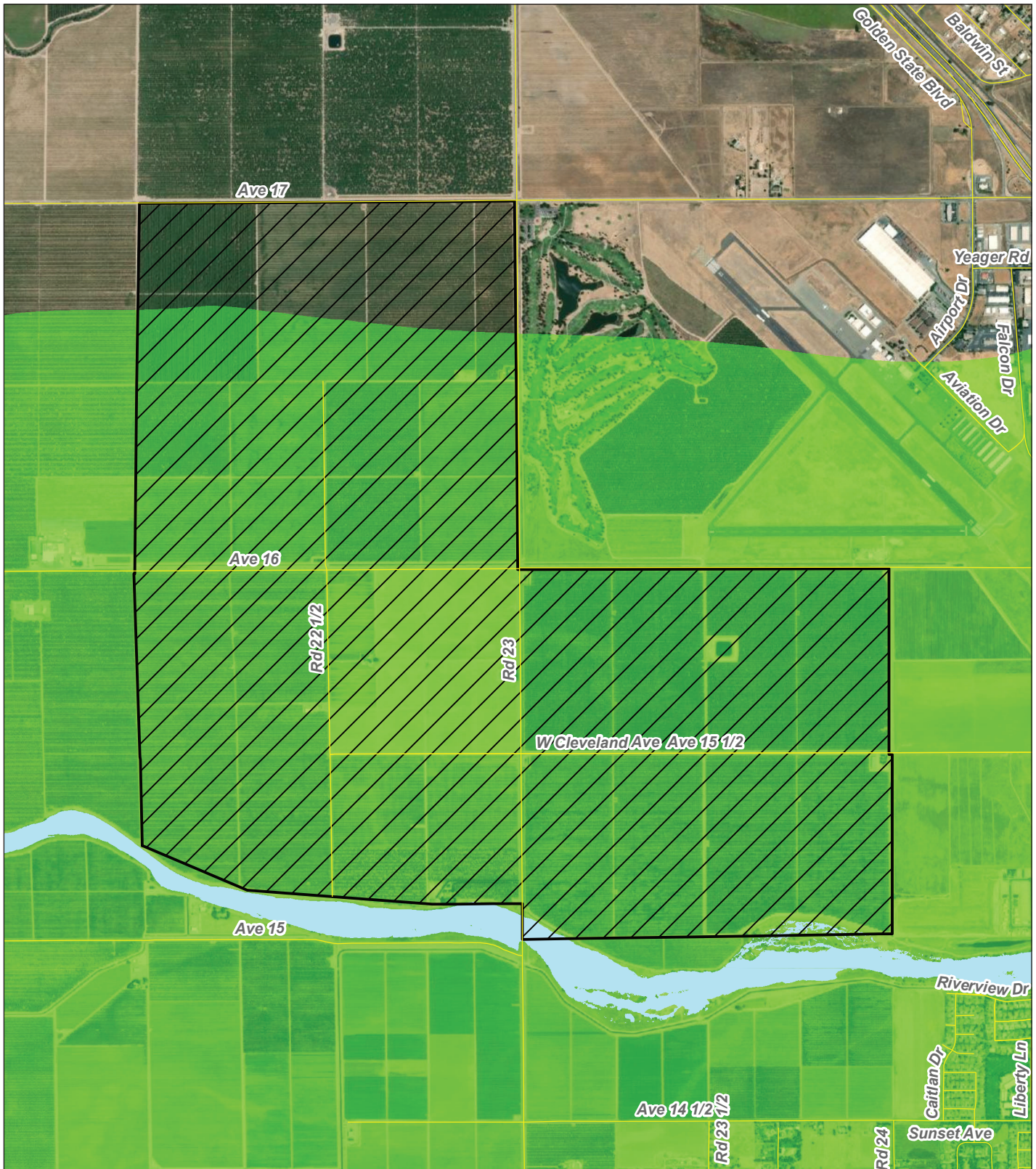
<sup>39</sup> United States Bureau of Reclamation. John Franchi Diversion Dam. Website: [www.usbr.gov/projects/index.php?id=171](https://www.usbr.gov/projects/index.php?id=171) (accessed February 23, 2020).

<sup>40</sup> Madera, County of. 2017. *Madera County Local Hazard Mitigation Plan Update*, op. cit.

<sup>41</sup> Madera, City of. 2009. *General Plan Update/Draft Environmental Impact Report*, op. cit.

<sup>42</sup> United States Geological Survey. Earthquake Glossary, *seiche*. Website: [earthquake.usgs.gov/learn/glossary/?term=seiche](https://earthquake.usgs.gov/learn/glossary/?term=seiche) (accessed February 26, 2020).

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**Tsunami.** A tsunami is an ocean wave caused by sudden large-scale displacement on the ocean floor and is associated with large earthquakes.<sup>43</sup> The Specific Plan Area is approximately 98 miles inland from the Pacific Ocean with an elevation ranging from about 230 feet above mean sea level (amsl) at the edge of the Specific Plan Area to about 260 feet amsl at the south-eastern corner of the Specific Plan Area. There are no tsunami flood hazards within Madera County.

**Mudflow.** A mudflow is type of landslide composed of saturated fine-grained earth materials with a wet cement consistency.<sup>44</sup> The Specific Plan Area is relatively flat and slopes to the southwest with an average grade of about 0.2 percent. There are no slopes on or immediately near the Specific Plan Area capable of generating a mudflow.

#### 4.10.1.2 Specific Plan Area

The Specific Plan Area is surrounded by primarily agriculture uses on the north and western boundaries, and the Fresno River and agriculture uses to the south. The Specific Plan Area has existing residential and agricultural support structures, as well as irrigation canals, as outlined in Section 3.1.3, Existing Land Uses and Infrastructure, of the Project Description.

#### 4.10.1.3 Regulatory Context

This section summarizes key federal, State and local regulations and programs related to the proposed Specific Plan.

##### Federal Regulations

**Clean Water Act.** The Clean Water Act (CWA), enacted in 1977, provides the framework for regulating discharges of pollutants into water and regulating surface water quality standards. The US Environmental Protection Agency (USEPA) is the federal responsible agency and is authorized under the CWA to implement water-quality regulations to reduce water contamination and restore the integrity of the nation's waters. Under Section 402(p) of the CWA, otherwise known as the National Pollutant Discharge Elimination System (NPDES), stormwater discharges are regulated to prevent water pollution. California has an approved State NPDES program and the SWRCB and nine Regional Water Quality Control Boards (RWQCBs) implement the program.

The CWA, under Section 303(d) also requires each state identify water bodies or segments of water bodies that are considered "impaired" as they do not meet one or more of the water-quality standards established by the State. Impaired waters are considered polluted and need further attention to support their beneficial uses. A Total Maximum Daily Load (TMDL) must be established for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water-quality standards. Categories 5, 4a, and 4b are considered part of Section 303(d), indicating water quality

<sup>43</sup> United States Geological Survey. Earthquake Glossary, *tsunami*. Website: [earthquake.usgs.gov/learn/glossary/?term=tsunami](https://earthquake.usgs.gov/learn/glossary/?term=tsunami) (accessed February 26, 2020).

<sup>44</sup> Colorado Geological Survey. Debris and Mud Flows. Website: [coloradogeologicalsurvey.org/hazards/debris-flows/](https://coloradogeologicalsurvey.org/hazards/debris-flows/) (accessed April 28, 2020).



parameters are not being met. Section 401<sup>45</sup> requires a federal permit if an activity may result in discharge to “waters of the United States”. Discharge must comply with other provisions of the act. Discharging other pollutants into US water are covered in Sections 402 and 403.

**National Pollutant Discharge Elimination System.** Municipal and industrial discharges to municipal storm sewer systems are regulated by NPDES permits. All facilities discharging pollutants into waters of the United States are required to obtain a NPDES permit. Stormwater discharges are also regulated under this program. Pollutant discharges are minimized under NPDES through a variety of measures. Examples of these measures include:

- Counties with storm drain systems serving a population of 100,000 or more, as well as construction sites 1 acre or more in size, must file for and obtain an NPDES permit.
- EPA’s Storm Water Phase I Final Rule requires an operator (such as a City) of a regulated municipal separate storm sewer system (MS4) to develop, implement, and enforce a program (including best management practices (BMPs), ordinances, or other regulatory mechanisms) to reduce pollutants in post-construction runoff to the City’s storm drain system from new development and redevelopment projects that result in the land disturbance of greater than or equal to 1 acre. The Phase I Final rule is required for publicly owned conveyances or systems of conveyances.
- EPA’S Phase II Final Rule requires an operator of a regulated small MS4 to reduce stormwater runoff pollutants by implementing proper erosion and sediment controls on construction sites, provide procedures for construction sites that consider water quality impacts, enforcement measures, sanitation to ensure compliance, and BMPs.

**National Flood Insurance Program.** The National Flood Insurance Act<sup>46</sup> passed in 1968 and is mandated by FEMA to evaluate flood hazards. The Flood Disaster Protection Act of 1973 also supports this Act. FIRMs for local and regional planners are provided by FEMA to promote sound land use and floodplain development and identify potential flood areas based on current conditions. Flood Insurance Studies are conducted by FEMA engineers and cartographers in order to delineate Special Flood Hazard Areas (SFHAs) on FIRMs. The Specific Plan Area is on FIRMs<sup>47</sup> 06039C1150E and 06039C1155E both dated Septembers 26, 2008.

In new development areas determined as high risk and that do not have a BFE, also known as a “Zone A”, the community is responsible for ensuring construction of the new development uses methods to minimize flood damage.<sup>48</sup>

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<sup>45</sup> United States Environmental Protection Agency. CWA Section 401 Certification. Website: [www.epa.gov/cwa-401/basic-information-cwa-section-401-certification](http://www.epa.gov/cwa-401/basic-information-cwa-section-401-certification) (accessed April 28, 2020).

<sup>46</sup> Federal Emergency Management Agency. The National Flood Insurance Program. Website: [www.fema.gov/national-flood-insurance-program](http://www.fema.gov/national-flood-insurance-program) (accessed April 28, 2020).

<sup>47</sup> Federal Emergency Management Agency. Flood Map Service Center, op. cit.

<sup>48</sup> Federal Emergency Management Agency. 2012. *The Zone A Manual*, op. cit.

## State Regulations

**Porter-Cologne Water Quality Act.** The Porter-Cologne Water Quality (California Water Code Section 13000 et seq.) is the basic water-quality regulation for California. The California Environmental Protection Agency (CalEPA) has delegated authority to the SWRCB to control State water rights and regulate water-quality restrictions by issuing NPDES permits for any discharge that may compromise land or surface water. The SWRCB, through its nine RWQCBs, carries out the regulation, protection, and administration of water quality in each region by requiring a Water Quality Control Plan, or Basin Plan. These Plans recognize regional differences in existing water quality, beneficial uses of the region's water body (ground and/or surface), and local water-quality conditions and problems. Plans establish standards for the basin and set water quality criteria for groundwater within the basin, as well recognizing actions necessary to achieve standards.

The City of Madera and the Specific Plan Area is within the San Joaquin Valley Basin and falls under the jurisdiction of the Central Valley RWQCB (Region 5). Region 5 is divided into three basins (Sacramento River, San Joaquin, and Tulare Lake Basin). The Basin Plan for San Joaquin Valley was last revised in 2018.

**Statewide General Construction Permit.** General Construction Permit, Order No. 2012-0006-DWQ requires construction projects of 1 acre or more to file Permit Registration Documents (PRDs) with the SWRCB prior to the start of construction.<sup>49</sup> The PRDs include a Notice of Intent (NOI), risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. SWPPP must demonstrate conformance with applicable BMPs, including a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the Specific Plan Area. BMPs must be listed within the SWPPP that would prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources.

SWPPP also addresses BMP failure by requiring a visual monitoring program, chemical monitoring program for nonvisible pollutants, and a sediment monitoring plan in case the site discharges directly to a water body listed on the 303(d) list for sediment. There are several categories of construction BMPs. The following categories<sup>50</sup> of construction BMPs are relevant to prevent stormwater discharge:

- Erosion Controls: Cover and/or bind soil surface, to prevent soil particles from being detached and transported by water or wind. Examples include mulch, geotextiles, mats, hydroseeding, earth dikes, and swales

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<sup>49</sup> State Water Resources Control Board. 2010. Storm Water Program. Website: [www.waterboards.ca.gov/water\\_issues/programs/stormwater/constpermits.shtml](http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml) (accessed on April 28, 2020).

<sup>50</sup> United States Environmental Protection Agency. 2007. *Developing Your Stormwater Pollution Prevention Plan, A Guide for Construction Sites*. Available online at: [www3.epa.gov/npdes/pubs/sw\\_swppp\\_guide.pdf](http://www3.epa.gov/npdes/pubs/sw_swppp_guide.pdf) (accessed April 28, 2020). May.

- **Sediment Controls:** Filter out soil particles that have been detached and transported in water. Examples include barriers such as straw bales, sandbags, fiber rolls, and gravel bag berms; desilting basin; and cleaning measures such as street sweeping.
- **Tracking Controls:** Minimize the tracking of soil off-site by vehicles. Examples include stabilized construction roadways and construction entrances/exits, and entrance/outlet tire wash.
- **Waste Management and Controls (housekeeping):** Management of materials and wastes to avoid contamination of stormwater. Examples include spill prevention and control, stockpile management, and management of solid wastes and hazardous wastes.

***Sustainable Groundwater Management Act.*** California legislature passed the SGMA in September 2014 to establish new measures for groundwater management and regulation statewide by providing sustainable local control of groundwater resources. Under SGMA, local agencies must establish governance of their subbasin by forming GSAs that have been given the authority to develop, adopt, and implement a Groundwater Sustainability Plan (GSP) for the subbasin. GSAs must define and monitor groundwater conditions in the subbasin and set and achieve sustainable groundwater management within 20 years of adopting the GSP.<sup>51</sup>

#### Local and Regional Regulations

***MS4 Permits for the Madera Region.*** Madera County implemented a Phase II MS4 General Permit (Order 2013-0001-DWQ) which expired on June 30, 2018<sup>52</sup> and a General Permit for Discharges of Storm Water Associated with Industrial Activity (Industrial General Permit) (Order 2014-0057-DWQ) which expires on June 30, 2020.<sup>53</sup> On June 21, 2016, Madera County adopted an Urgency Ordinance (Urgency Ordinance No. 680)<sup>54</sup> giving the county control relating to stormwater and storm sewer systems, illicit discharge and connections, construction site stormwater runoff and landscaping as required by MS4. The Madera County MS4 Permit is a five-year plan that will expire in 2021 and follows NPDES requirements. The Madera County MS4 Permit uses six Minimum Control Measures (MCMs) to manage stormwater discharges:

1. Public Education and Outreach on Storm Water Impacts
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Runoff Control

<sup>51</sup> Davids Engineering, Inc., et. al. 2020, op. cit.

<sup>52</sup> State Water Resource Control Board. 2013. *General Permit for Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s)*, Order No. 2013-0001-DWQ. Available online at: [www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2013/wqo2013\\_0001dwq.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2013/wqo2013_0001dwq.pdf) (accessed February 26, 2020).

<sup>53</sup> State Water Resource Control Board. 2014. *General Permit for Storm Water Discharges Associated with Industrial Activities*, Order 2014-0057-DWQ. Available online at: [www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2014/wqo2014\\_0057\\_dwq\\_rev\\_mar2015.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0057_dwq_rev_mar2015.pdf) (accessed February 26, 2020).

<sup>54</sup> Madera, County of. AIS Ordinance 1860. Website: [maderacountyca.iqm2.com/Citizens/Detail\\_Legifile.aspx?Frame=&MeetingID=1057&MediaPosition=&ID=1860&CssClass=](http://maderacountyca.iqm2.com/Citizens/Detail_Legifile.aspx?Frame=&MeetingID=1057&MediaPosition=&ID=1860&CssClass=) (accessed April 28, 2020).

5. Post-Construction Storm Water Management in New Development and Redevelopment
6. Pollution Prevention/Good Housekeeping for Municipal Operations.

The most recent SWRP produced by Madera County was released to the public on December 28, 2017.<sup>55</sup> Madera County prepared the SWRP “with Community input through direct outreach and a series of Stakeholder, Public, and Technical Advisory (TAC) Meetings.” The SWRP includes 24 projects from Stakeholders that will provide groundwater recharge, low impact development/green infrastructure, conveyance and infrastructure improvements, floodplain restoration and water quality improvements in Madera County.

***Madera County Flood Control & Water Conservation Agency.*** The Madera County Flood Control & Water Conservation Agency has adopted floodplain management regulations under Government Code Sections 65302, 65560, and 65800 and California Code Article 122 [21570-21572]. These regulations are designed to promote public health, safety, general welfare, and minimize public and private losses due to flood conditions.

***Madera Irrigation District.*** The MID is a public agency encompassing approximately 139,665 acres and was established by the State Legislature as a Special Act District. The MID has a mission to obtain and manage surface water (including stormwater) and groundwater supplies at an affordable price and in a way that will ensure long-term viability for its agricultural service area.<sup>56</sup>

***City of Madera Urban Water Management Plan.*** The City of Madera has prepared an Urban Water Management Plan (UWMP) in March 2017 (Water Code Section 10610-10656). The UWMP describes the current conditions and characteristics of the City of Madera and includes information regarding the City’s WWTP.

***City of Madera General Plan.*** The City of Madera General Plan is the City's primary policy planning document. Through its ten elements, the General Plan provides the framework for the management and utilization of the City's physical, economic, and human resources. Each element contains goals, policies, and implementation measures that guide development within the City. The General Plan strives to maintain and improve Madera’s quality of life and implement the community’s shared vision for the future. The General Plan is the official policy statement of the City Council to guide development (both public and private), as well as the City’s operations and decisions. Hydrology and water quality related goals, objectives, and policies specific to the city are included in the General Plan.

The General Plan contains policies that address hydrology and water quality in the proposed Specific Plan and are listed in Table 4.10.A.

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<sup>55</sup> Madera, County of. 2017. *County of Madera Storm Water Resource Plan*. Available online at: [www.madera-countywater.com/wp-content/uploads/2018/06/FINAL\\_MaderaSWRP\\_171228.pdf](http://www.madera-countywater.com/wp-content/uploads/2018/06/FINAL_MaderaSWRP_171228.pdf) (accessed April 28, 2020). December.

<sup>56</sup> Madera Irrigation District. History of Madera Irrigation District. Website: [www.madera-id.org/about-us/history-of-mid](http://www.madera-id.org/about-us/history-of-mid) (accessed February 25, 2020).

**Table 4.10.A: General Plan Policies Related to Hydrology and Water Quality**

Policy/Action Item Number	Policy
<b>Health and Safety Element</b>	
Policy HS-16	The City will work with other responsible agencies on efforts to clean up or contain identified soil or water contamination identified in the city limits. This policy will extend to the former Oberti salt ponds and other related facilities at such time as they are annexed to the city.
Policy HS-19	The City shall not permit new development projects to result in new or increased flooding impacts on adjoining parcels in either upstream or downstream areas.
Policy HS-20	The City's first priority in preventing risks to life and property resulting from flooding shall be to designate appropriate land uses in areas subject to flooding. Only when this land use-based approach is not sufficient to reduce hazards to life and property to acceptable levels will the City support the construction of new flood control projects.
Policy HS-21	The City shall require any development on land subject to a 100-year flood event, based on Federal Emergency Management Agency (FEMA) or on other updated mapping acceptable to the City, to conform to NFIP standards.
Policy HS-22	Creation of lots whose access will be inundated by flows resulting from a 10-year or greater storm shall not be allowed. Bridges or similar structures may be used to provide flood-free access.
Policy HS-23	The City shall limit the number of crossings of natural streams in order to reduce potential flooding, degradation, hydrological changes and property access problems. Among the methods which may be used to reduce the number of crossings is a shared access drive serving two or more parcels.
Policy HS-24	Parcels shall not be created on which the presence of easements, floodplain, marsh or riparian habitat, or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots specifically created for dedication to the City or another appropriate party for habitat protection, flood control, drainage, or wetland maintenance.
Policy HS-25	New and modified bridge structures shall not cause an increase in water surface elevations of the 100-year floodplain exceeding one foot, unless analysis clearly indicates that the physical and/or economic use of upstream or downstream property will not be adversely affected.
Policy HS-26	The City shall require all new urban development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing comprehensive drainage plans. All such control measures will consider potential affects to adjacent property owners.
Policy HS-27	Upon adoption of the Central Valley Flood Protection Plan, and this General Plan, the City shall review the consistencies of City flood-related planning documents for consistency with the current General Plan with the provisions of Central Valley Flood Protection Plan and the policies of the General Plan.
Policy HS-28	The City shall continue to cooperate with Madera County and other agencies in pre-disaster planning activities for potential dam breach and similar potential disasters.
<b>Conservation Element</b>	
Policy CON-1	The City will coordinate with local, regional, and state water suppliers and water resource managers to identify water management strategies and issues that ensure a clean and sustainable water supply.
Policy CON-2	The City supports the consideration and implementation of a broad range of strategies to ensure the long-term sustainability of its water supply, including strategies related to conservation, reclamation, recharge, and diversification of supply.



**Table 4.10.A: General Plan Policies Related to Hydrology and Water Quality**

Policy/Action Item Number	Policy
Policy CON-3	The City supports natural groundwater recharge and new groundwater recharge opportunities through means such as: <ul style="list-style-type: none"> <li>• Developing a comprehensive groundwater recharge program to be applied in conjunction with new development.</li> <li>• Increasing the area on developed sites into which rainwater can percolate.</li> <li>• Providing areas where rainwater and other water can collect and percolate into the ground.</li> <li>• Providing for groundwater recharge in storm drainage facilities.</li> <li>• The use of reclaimed water to recharge the groundwater table.</li> </ul>
Policy CON-4	The City will coordinate water resource management planning with other conservation planning efforts, such as those related to open space, parkland, and agricultural preservation.
Policy CON-5	To reduce the need for groundwater, the City encourages water conservation and the use of reclaimed water.
Policy CON-8	The City encourages Low Impact Development practices in all residential, commercial, office, and mixed-use discretionary projects and land division projects to reduce, treat, infiltrate, and manage runoff flows caused by storms, urban runoff, and impervious surfaces. Low impact development practices may include: <ul style="list-style-type: none"> <li>• Use of small scale stormwater controls such as bioretention, grass swales and channels, vegetated rooftops, rain barrels and cisterns.</li> <li>• Reduction of impervious surfaces through site design and use of pervious paving materials.</li> <li>• Retention of natural features such as trees and ponds on site.</li> <li>• The use of drought tolerant plant materials and/or water-conserving irrigation systems.</li> </ul>
Policy CON-11	The City shall protect and maintain water quality for the health of all users, including natural plant and animal communities.
Policy CON-12	The City shall seek to minimize toxic runoff from such sources as homes, golf courses, and roadways. Examples of potential programs include: <ul style="list-style-type: none"> <li>• The use of “bioswales” and similar features (such as infiltration trenches, filter trips, and vegetated buffers) to trap contaminants;</li> <li>• Installation of grease/oil separators to keep these contaminants out of storm runoff;</li> <li>• Regular street sweeping programs to prevent the buildup of oil, grease, and other contaminants and keep them from being swept into creeks and rivers;</li> <li>• Minimizing pesticide use and promoting the use of natural pest controls;</li> <li>• Encouraging the installation of “gray water” systems;</li> <li>• The development of new storm drain runoff retention ponds for sediment and pollutant removal based on the updated storm water master plan.</li> </ul>
Policy CON-13	The City will endeavor to protect groundwater quality from pollution by point and non-point sources.
Policy CON-14	The relocation of natural stream courses is discouraged. Where flood protection is a necessity, the City supports leaving existing natural stream courses and adjoining land in a natural state and creating new storm drainage capacity in parallel above- or below-ground facilities.

Source: City of Madera General Plan (October 2009).

#### 4.10.2 Impacts and Mitigation Measures

The following section presents a discussion of the impacts related to hydrology and water quality that could result from implementation of the proposed Specific Plan. The section begins with the criteria of significance, which establish the thresholds to determine if an impact is significant. The latter part of this section presents the impacts associated with implementation of the proposed

Specific Plan and the recommended mitigation measures, if required. Cumulative impacts are also addressed.

#### 4.10.2.1 Significance Criteria

The thresholds for impacts related to hydrology and water quality used in this analysis are consistent with Appendix G of the State CEQA Guidelines. Development of the proposed Specific Plan would result in a significant impact related to hydrology and water quality if it would:

- |                         |  |
|-------------------------|--|
| <b>Threshold 4.10.1</b> | <b>Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;</b>   |
| <b>Threshold 4.10.2</b> | <b>Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;</b>  |
| <b>Threshold 4.10.3</b> | <b>Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:</b> <ul style="list-style-type: none"><li>• <b>Result in a substantial erosion or siltation on- or off-site;</b></li><li>• <b>Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;</b></li><li>• <b>Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or</b></li><li>• <b>Impede or redirect flood flows.</b></li></ul> |
| <b>Threshold 4.10.4</b> | <b>In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or</b>   |
| <b>Threshold 4.10.5</b> | <b>Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.</b>  |

#### 4.10.2.2 Project Impacts

The following discussion describes the potential impacts related to hydrology and water quality that could result from implementation of the proposed Specific Plan.

- |                         |  |
|-------------------------|--|
| <b>Threshold 4.10.1</b> | <b>Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?</b> |
|-------------------------|--|

Anticipated buildout of the proposed Specific Plan would include several construction activities (clearing, grading, excavation) that could impact water through soil erosion and increased sediment and debris discharged into runoff. Other risks to surface water quality include construction materials that would be on-site such as fuels, paints, and solvents. Construction materials and equipment that are temporary stored in work areas or staging areas have the potential to release hazardous materials, sediments, or trash into the storm drain system.

Implementing the proposed Specific Plan would result in approximately 10,800 residential units, approximately 2.1 million square feet of commercial and office space, approximately 165 acres of parks and recreational area, and approximately 55 acres of public facilities including schools.

**Pollutants of Concern from Construction Projects.** The following contaminants can be released during buildout and can contaminate stormwater: sediment, nutrients, bacteria and viruses, oil and grease, metals, organic (carbon-based) compounds, oxygen-demanding substances, pesticides, and trash and debris.

It should be noted organic compounds are found in pesticides, solvents, and hydrocarbons. To further clarify, oxygen-demanding substances include proteins, carbohydrates, and fats caused by microbial degradation which increases oxygen demand when in water.

**Construction Water Quality Requirements.** Construction occurring within the Specific Plan Area that would be more than one acre in size is required to comply with the General Construction Permit, Order No. 2012-0006-DWQ, issued by the SWRCB in 2012. Through this permit, future discretionary development projects would develop and implement a SWPPP prior to the initiation of grading that would estimate sediment risk from construction activities to receiving waters and specify BMPs that would be used during implementation of the proposed Specific Plan to minimize pollution of stormwater. BMP categories that would be implemented include erosion, sediment, wind erosion, and sediment control. These BMPs are discussed above. As a result, construction-related impacts would be less than significant.

**Operational Impacts.** Runoff resulting from the anticipated buildout of the Specific Plan Area would be managed by the City and would meet water quality standards as listed in Madera County's SWRP, and as required by applicable regulatory permits. Additionally, the City requires developers to improve storm drainage systems in conjunction with new housing developments. These improvements are guided by City Code and Standard Specifications as referenced in the General Plan, and set forth in the Infrastructure Master Plan, included as Appendix C of this Draft EIR.

The following General Plan policies address water quality standards:

Policy HS-16: The City will work with other responsible agencies on efforts to clean up or contain identified soil or water contamination in the city limits. This policy will extend to the former Oberti salt ponds and other related facilities at such time as they are annexed to the city.

Policy CON-5: To reduce the need for groundwater, the City encourages water conservation and the use of reclaimed water.

Policy CON-8: The City encourages Low Impact Development practices in all residential, commercial, office, and mixed-use discretionary projects and land division projects to reduce, treat, infiltrate, and manage runoff flows caused by storms, urban runoff, and impervious surfaces. Low impact development practices may include:

- Use of small-scale stormwater controls such as bioretention, grass swales and channels, vegetated rooftops, rain barrels and cisterns.
- Reduction of impervious surfaces through site design and use of pervious paving materials
- Retention of natural features such as trees and ponds on site.
- The use of drought tolerant plant materials and/or water-conserving irrigation systems.

Policy CON-11: The City shall protect and maintain water quality for the health of all users, including natural plant and animal communities.

Policy CON-12: The City shall seek to minimize toxic runoff from such sources as homes, golf courses, and roadways. Examples of potential programs include:

- The use of “bioswales” and similar features (such as infiltration trenches, filter trips, and vegetated buffers) to trap contaminants;
- Installation of grease/oil separators to keep these contaminants out of storm runoff;
- Regular street sweeping programs to prevent the buildup of oil, grease, and other contaminants and keep them from being swept into creeks and rivers;
- Minimizing pesticide use and promoting the use of natural pest controls;
- Encouraging the installation of “gray water” systems;
- The development of new storm drain runoff retention ponds for sediment and pollutant removal based on the updated storm water master plan.

Policy CON-13: The City will endeavor to protect groundwater quality from pollution by point and non-point sources.

Storm water originating from the development of the proposed Specific Plan shall be treated utilizing BMPs as permitted by the NPDES general permitting process of the Clean Water Act. BMPs for the proposed Specific Plan would be developed during the design phase, and may be drawn from the City or local area authorities including Caltrans. Regulatory Compliance Measure (RCM) HYD-1, is included below to further identify regulatory compliance required prior to construction activities. Compliance with existing regulations including the General Construction Permit, BMPs, the Standard

Condition of Approval and implementation of General Plan policies would reduce potential impacts related to water quality to less-than-significant levels.

RCM HYD-1: Prior to approval of each subsequent Specific Plan grading permit, grading plans must be prepared for and approved by the City of Madera Engineering Department and must be in compliance with the General Construction Permit including implementation of SWPPPs with specific BMPs to minimize pollution of stormwater. BMPs shall follow City of Madera Storm drainage BMPs and Storm Drainage Management Plan. The City shall also review and confirm compliance with Statewide National Pollutant Discharge Elimination System (NPDES) permits for construction runoff and municipal storm drain systems (MS4) provisions of water quality control measures.

Significance Without Mitigation: Less than significant. Incorporation of RCM HYD-1 would ensure regulatory compliance related to water quality standards throughout implementation of the proposed Specific Plan.

**Threshold 4.10.2      Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?**

Water demands for the City of Madera are increasing each year. In 2014, the City had an annual demand of 13,800 acre-feet to service the 63,105 population.<sup>57</sup> Anticipated buildout of the proposed Specific Plan would increase water demands within the Specific Plan Area and would encourage the need for sustainable water sources. The City of Madera uses a variety of methods to facilitate groundwater recharge. The General Plan,<sup>58</sup> Madera County Local Hazard Mitigation Plan,<sup>59</sup> and FEMA Flood Insurance Study have noted the Madera County area has excellent drainage.

Stormwater from the City is sent to retention basins to recharge and manage the Madera Subbasin. During drier periods of time, the City as the option to use small purchases of surface water from the MID to send to the City's stormwater basins. In addition, the Infrastructure Master Plan for the proposed Specific Plan includes three on-site retention basins to capture excess flood waters from MID to be used for groundwater recharge. A study conducted by the EPA (among others) discusses urban water management BMPs and has identified successful water quality control within infiltration basins<sup>60</sup> where runoff infiltrated into the ground separates contaminants that attach to the soil and those that dissolve.

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<sup>57</sup> Madera, County of. 2017. *County of Madera Storm Water Resource Plan*, op. cit.

<sup>58</sup> Madera, City of. 2010. *General Plan*. October.

<sup>59</sup> Madera, County of. 2017. *Madera County Local Hazard Mitigation Plan Update*. op. cit.

<sup>60</sup> United States Environmental Protection Agency. 1999. *Preliminary Data Summary of Urban Storm Water Best Management Practices*. Available online at: [www.epa.gov/sites/production/files/2015-11/documents/urban-stormwater-bmps\\_preliminary-study\\_1999.pdf](http://www.epa.gov/sites/production/files/2015-11/documents/urban-stormwater-bmps_preliminary-study_1999.pdf) (accessed February 26, 2020).



The following General Plan policies address groundwater recharge and supplies:

- Policy CON-1: The City will coordinate with local, regional, and state water suppliers and water resource managers to identify water management strategies and issues that ensure a clean and sustainable water supply.
- Policy CON-2: The City supports the consideration and implementation of a broad range of strategies to ensure the long-term sustainability of its water supply, including strategies related to conservation, reclamation, recharge, and diversification of supply.
- Policy CON-3: The City supports natural groundwater recharge and new groundwater recharge opportunities through means such as:
- Developing a comprehensive groundwater recharge program to be applied in conjunction with new development
  - Increasing the area on developed sites into which rainwater can percolate
  - Providing areas where rainwater and other water can collect and percolate into the ground.
  - Providing for groundwater recharge in storm drainage facilities.
  - The use of reclaimed water to recharge the groundwater table.

As stated in the Infrastructure Master Plan, reclaimed water would be used for groundwater recharge and irrigation of landscaped areas and open space areas to reduce groundwater demand. As stated in the Water Supply Assessment (WSA) prepared for the proposed Specific Plan (included as Appendix I of this EIR), the GSP concluded that the groundwater basin is capable of supplying the potable water required to meet the City's water demands through 2040. The WSA further states that the existing City water distribution system infrastructure is not capable of supplying the water required to meet the demands of the City and the proposed Specific Plan through 2040. However, the master planned water system infrastructure would provide the City the ability to meet the demands of the City and proposed Specific Plan through 2040. As such, implementation of the proposed Specific Plan would increase impervious surface within the Specific Plan Area, but with the use of recharge basins included in the Infrastructure Master Plan and use of the City's water supply and recycled water, the proposed Specific Plan would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. In addition, incorporation of RCM HYD-1 would require regulatory compliance to address water quality of runoff generated during construction and operation of the proposed Specific Plan. As a result, a less-than-significant impact would occur.

Significance Without Mitigation: Less than significant. No mitigation is required.

**Threshold 4.10.3      Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:**

**Result in a substantial erosion or siltation on- or off-site?** Erosion is a natural process in which soil is moved from place to place by wind or from flowing water. The effects of erosion within the Specific Plan Area can be accelerated by ground-disturbing activities associated with development. Erosion control methods outlined in the SWPPPs for future development within the Specific Plan Area would limit soil transportation and erosion.

Siltation is the settling of sediment to the bed of a stream or lake which increases the turbidity of water. Turbid water can have harmful effects to aquatic life by clogging fish gills, reducing spawning habitat, and suppress aquatic vegetation growth.

Anticipated buildout of the proposed Specific Plan would result in the development of the existing agricultural lands. Bare soils, common within farmlands are more susceptible to erosion than an already developed urban land, thus it is expected erosion would occur on-site. During construction activities, and in compliance with future project-specific SWPPPs, several construction BMPs would be implemented to reduce potential impacts related to erosion and siltation. These BMPs would include, but are not limited to, covering and/or binding soil surfaces to prevent soil from being detached and transported by water or wind, and the use of barriers such as straw bales and sandbags to control sediment. RCM HYD-1 requires the compliance with City of Madera construction requirements including implementation of a SWPPP with construction BMPs.

**Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?** Anticipated buildout of the proposed Specific Plan would increase the amount of impermeable land surfaces on-site which would increase runoff from the Specific Plan Area. Currently there is no storm water flow crossing through the Specific Plan Area from any upstream adjacent property. Runoff from the Specific Plan Area would travel to the three proposed retention basins located within the north-west and central east portions of the Specific Plan Area.<sup>61</sup> As identified in the Infrastructure Master Plan, all grading within the Specific Plan Area would be completed in accordance with the City of Madera Grading Ordinance, the current building code, and the recommendations provided in the Infrastructure Master Plan. During Project design, detailed grading plans shall be prepared, in conformance with the overall drainage concept and the defined drainage area boundaries. As identified in RCM HYD-1, grading plans must be prepared for and reviewed by the City of Madera Engineering Department. As a result, the anticipated buildout of the proposed Specific Plan would not substantially alter drainage patterns on or across the Specific Plan Area, and building code regulations would be enforced to ensure that runoff would not result in flooding on- or offsite.

**Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?** As required through the incorporation of RCM HYD-1, BMPs would be enforced during the anticipated

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<sup>61</sup> Provost and Pritchard Consulting Group. 2017, op. cit.

buildout of the proposed Specific Plan which would limit polluted runoff to the City's storm drains. Impacts on runoff and storm drain capacity would be less than significant, as substantiated above.

**Impede or redirect flood flows?** Although implementation of the proposed Specific Plan would result in impervious surface, because there are no drainages that cross the Specific Plan Area that would be altered, drainage patterns would not be altered. Expansion and maintenance of the City's municipal storm drain system in the identified flood zone in the Southeast Neighborhood of the Specific Plan Area would minimize flood risks. Runoff within the Specific Plan Area would be conveyed to storm drain inlets and then carried to retention basins to infiltrate into soil. The Specific Plan Area would also have improved drainage systems as outlined in the Infrastructure Master Plan for the proposed Specific Plan.

The following General Plan policies address erosion and stormwater runoff:

Policy CON-14: The relocation of natural stream courses is discouraged. Where flood protection is a necessity, the City supports leaving existing natural stream courses and adjoining land in a natural state and creating new storm drainage capacity in parallel above- or below-ground facilities.

Policy CON-8: The City encourages Low Impact Development practices in all residential, commercial, office, and mixed-use discretionary projects and land division projects to reduce, treat, infiltrate, and manage runoff flows caused by storms, urban runoff, and impervious surfaces. Low impact development practices may include:

- Use of small-scale stormwater controls such as bioretention, grass swales and channels, vegetated rooftops, rain barrels and cisterns.
- Reduction of impervious surfaces through site design and use of pervious paving materials
- Retention of natural features such as trees and ponds on site.
- The use of drought tolerant plant materials and/or water-conserving irrigation systems."

Policy HS-19: The City shall not permit new development projects to result in new or increased flooding impacts on adjoining parcels in either upstream or downstream areas.

Policy HS-20: The City's first priority in preventing risks to life and property resulting from flooding shall be to designate appropriate land uses in areas subject to flooding. Only when this land use-based approach is not sufficient to reduce hazards to life and property to acceptable levels will the City support the construction of new flood control projects.

- Policy HS-21: The City shall require any development on land subject to a 100-year flood event, based on Federal Emergency Management Agency (FEMA) or on other updated mapping acceptable to the City, to conform to NFIP standards.
- Policy HS-22: Creation of lots whose access will be inundated by flows resulting from a 10-year or greater storm shall not be allowed. Bridges or similar structures may be used to provide flood-free access.
- Policy HS-24: Parcels shall not be created on which the presence of easements, floodplain, marsh or riparian habitat, or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots specifically created for dedication to the City or another appropriate party for habitat protection, flood control, drainage, or wetland maintenance.

With incorporation of RCM HYD-1 which requires implementation of a SWPPP, BMPs, the Infrastructure Master Plan for the proposed Specific Plan, impacts related to the existing drainage pattern of the Specific Plan Area to less-than-significant levels.

Significance Without Mitigation: Less than significant. No mitigation is required.

**Threshold 4.10.4      Would the project release of pollutants due to project inundation in a flood hazard, tsunami, or seiche zones?**

The Specific Plan Area is located within a high-risk flood zone<sup>62</sup> and has the potential to be affected by inundation. However, the Specific Plan Area would not be a cause for inundation as the anticipated buildout of the proposed Specific Plan would be contained within the Specific Plan Area. Some levee failure has previously occurred along the Fresno River. A \$2.5 million grant was obtained by the County to repair these critical sites.<sup>63</sup> The anticipated buildout of the proposed Specific Plan would not exacerbate these existing conditions as future development within the Specific Plan Area would result in continued maintenance and expansion of the City's municipal storm drain system, and implementation of the Infrastructure Master Plan would minimize potential flooding issues associated with urban growth within the Specific Plan Area. Additionally, the City's continued participation in the National Flood Insurance Program would minimize risks associated with existing flood hazards.

The Specific Plan Area, as well as the City of Madera, has historically been subject to low to moderate ground shaking and has a relatively low probability of shaking.<sup>64</sup> Seiches are unlikely to form due to the low seismic energy produced in the area. Additionally, the nearest body of water to the Specific Plan Area is the Madera Lake approximately 7.75 miles northeast from the Specific Plan Area. According to the DWR, if the Madera Lake Dam were to inundate, the Specific Plan Area would

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<sup>62</sup> Federal Emergency Management Agency, National Flood Hazard Layer Viewer, op. cit.

<sup>63</sup> Madera, County of. 2017. *Madera County Local Hazard Mitigation Plan Update*, op. cit.

<sup>64</sup> California Emergency Management Agency and Earthquake Country Alliance. 2009. Central Valley (South) ~ ShakeOut Area, Probability of Shaking. Available online at: [www.shakeout.org/california/images/Central\\_Valley\\_South\\_Probability\\_map.jpg](http://www.shakeout.org/california/images/Central_Valley_South_Probability_map.jpg) (accessed April 29, 2020). Revised June 7, 2010.

not be affected and such inundation would be contained within the Fresno River.<sup>65</sup> The Specific Plan Area would not cause or exacerbate a flood hazard related to the release of pollutants because the Specific Plan Area is downstream from large bodies that are not projected to flood the Specific Plan Area. Additionally, with expansion and maintenance of the City's municipal storm drain system through implementation of the Infrastructure Master Plan, the release of pollutants during flooding would be minimized.

The Specific Plan Area is approximately 98 miles inland from the Pacific Ocean, thus there are no tsunami hazards associated with the Specific Plan Area.

Anticipated buildout of the proposed Specific Plan would not be the cause for any potential pollutant release. Construction within the Specific Plan Area would follow regulations (as specified in RCM HYD-1), as well as the following General Plan policies that address potential flood, seiche, and tsunami hazards:

- Policy HS-19: The City shall not permit new development projects to result in new or increased flooding impacts on adjoining parcels in either upstream or downstream areas.
- Policy HS-20: The City's first priority in preventing risks to life and property resulting from flooding shall be to designate appropriate land uses in areas subject to flooding. Only when this land use-based approach is not sufficient to reduce hazards to life and property to acceptable levels will the City support the construction of new flood control projects.
- Policy HS-21: The City shall require any development on land subject to a 100-year flood event, based on Federal Emergency Management Agency (FEMA) or on other updated mapping acceptable to the City, to conform to NFIP standards.
- Policy HS-22: Creation of lots whose access will be inundated by flows resulting from a 10-year or greater storm shall not be allowed. Bridges or similar structures may be used to provide flood-free access.
- Policy HS-24: Parcels shall not be created on which the presence of easements, floodplain, marsh or riparian habitat, or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots specifically created for dedication to the City or another appropriate party for habitat protection, flood control, drainage, or wetland maintenance.
- Policy HS-27: Upon adoption of the Central Valley Flood Protection Plan, and this General Plan, the City shall review the consistencies of City flood-related planning documents for consistency with the current General Plan with the provisions of Central Valley Flood Protection Plan and the policies of the General Plan.

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<sup>65</sup> California Department of Water Resources. Division of Safety of Dams. California Dam Breach Inundation Maps, op. cit.



Policy HS-28: The City shall continue to cooperate with Madera County and other agencies in pre-disaster planning activities for potential dam breach and similar potential disasters.

Implementation of the General Plan would reduce potential impacts related to the release of pollutants due to project inundation to less-than-significant levels.

Significance Without Mitigation: Less than significant. No mitigation is required.

**Threshold 4.10.5      Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan (SGMA)?**

Implementation of the proposed Specific Plan would not compromise water quality control. Incorporation of RCM HYD-1 would require Statewide NPDES permits for construction runoff and municipal storm drain systems (MS4) require provisions of water quality control measures be upheld to protect groundwater quality. Stormwater is sent to retention basins within the Specific Plan Area as well as the City and serves to recharge groundwater. This process would allow multi-generational use by returning water back into the aquifer which would ultimately help with the implementation of SGMA.

The following General Plan policies address water quality and groundwater management:

Policy HS-16: The City will work with other responsible agencies on efforts to clean up or contain identified soil or water contamination in the city limits. This policy will extend to the former Oberti salt ponds and other related facilities at such time as they are annexed to the city.

Policy CON-1: The City will coordinate with local, regional, and state water suppliers and water resource managers to identify water management strategies and issues that ensure a clean and sustainable water supply.

Policy CON-2: The City supports the consideration and implementation of a broad range of strategies to ensure the long-term sustainability of its water supply, including strategies related to conservation, reclamation, recharge, and diversification of supply.

Policy CON-3: The City supports natural groundwater recharge and new groundwater recharge opportunities through means such as:

- Developing a comprehensive groundwater recharge program to be applied in conjunction with new development
- Increasing the area on developed sites into which rainwater can percolate
- Providing areas where rainwater and other water can collect and percolate into the ground.

- Providing for groundwater recharge in storm drainage facilities.
- The use of reclaimed water to recharge the groundwater table.

Policy CON-5: To reduce the need for groundwater, the City encourages water conservation and the use of reclaimed water.

Policy CON-8: The City encourages Low Impact Development practices in all residential, commercial, office, and mixed-use discretionary projects and land division projects to reduce, treat, infiltrate, and manage runoff flows caused by storms, urban runoff, and impervious surfaces. Low impact development practices may include:

- Use of small-scale stormwater controls such as bioretention, grass swales and channels, vegetated rooftops, rain barrels and cisterns.
- Reduction of impervious surfaces through site design and use of pervious paving materials
- Retention of natural features such as trees and ponds on site.
- The use of drought tolerant plant materials and/or water-conserving irrigation systems.

Policy CON-11: The City shall protect and maintain water quality for the health of all users, including natural plant and animal communities.

Policy CON-12: The City shall seek to minimize toxic runoff from such sources as homes, golf courses, and roadways. Examples of potential programs include:

- The use of “bioswales” and similar features (such as infiltration trenches, filter trips, and vegetated buffers) to trap contaminants;
- Installation of grease/oil separators to keep these contaminants out of storm runoff;
- Regular street sweeping programs to prevent the buildup of oil, grease, and other contaminants and keep them from being swept into creeks and rivers;
- Minimizing pesticide use and promoting the use of natural pest controls;
- Encouraging the installation of “gray water” systems;
- The development of new storm drain runoff retention ponds for sediment and pollutant removal based on the updated storm water master plan.

Policy CON-13: The City will endeavor to protect groundwater quality from pollution by point and non-point sources.

Implementation of the proposed Specific Plan would not conflict or implementation of a water quality control plan or a sustainable groundwater management plan by implementing the General Plan, Statewide NPDES permits for construction runoff, and municipal storm drain systems (MS4), as identified in RCM HYD-1. As a result, a less-than-significant impact would occur.

Significance Without Mitigation: Less than significant. No mitigation is required.

#### 4.10.2.3 Cumulative Impacts

The proposed Specific Plan would not have a significant effect on the environment – in combination with other projects and would not contribute to a significant cumulative impact related to hydrology and water quality.

**Surface Water, Drainage, and Flooding.** The area considered for cumulative impacts to surface water, drainage, and flooding is the Madera Subbasin, which spans about 543 square miles and most of Madera County. Implementing the proposed Specific Plan would result in increased impermeable surfaces, thus increasing runoff to surface waters and storm drainage systems. Anticipated buildout of the Specific Plan Area would be required to infiltrate or treat stormwater pursuant to the MS4 permit. The City of Madera and Madera County each have policies limiting and regulating development in 100-year flood zones. Cumulative hydrology and flooding impacts would be less than significant after compliance with the MS4 permit. Impacts resulting from implementation of the proposed Specific Plan would not be cumulatively considerable because RCM HYD-1 would be incorporated into the proposed Specific Plan and applicable to each subsequent project to ensure that regulatory requirements are met.

**Groundwater Supply and Recharge.** Cumulative groundwater impacts resulting of the proposed Specific Plan would not affect the Madera Subbasin. Runoff created during development would be treated and inevitable recharge the Madera Subbasin. Cumulative groundwater impacts would be less than significant after compliance with the MS4 permit, and potential impacts would not be cumulatively considerable.

**Water Quality.** Runoff from the Specific Plan Area would not significantly affect water quality within the Madera Subbasin. Development of future projects within the Specific Plan Area that are one acre or more would require a Stormwater Pollution Prevention Plans pursuant to the Statewide General Construction Permit. Cumulative water quality impacts would be less than significant after compliance the General Construction Permit, Order No. 2012-0006-DWQ.

Significance Without Mitigation: Less than significant. No mitigation is required.

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