

CHAPTER 2 – PLAN AREA
Groundwater Sustainability Plan
for the Marina GSA Area
of the 180/400 Foot Aquifer Subbasin

City of Marina
Groundwater Sustainability Agency
Marina, California



JANUARY 2020

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2 PLAN AREA

Regulation Requirements:

§354.8 Each Plan shall include a description of the geographic areas covered, including the following information:

(a) One or more maps of the basin that depict the following, as applicable:

- (1) The area covered by the Plan, delineating areas managed by the Agency as an exclusive Agency and any areas for which the Agency is not an exclusive Agency, and the name and location of any adjacent basins.
- (2) Adjudicated areas, other Agencies within the basin, and areas covered by an Alternative.
- (3) Jurisdictional boundaries of federal or state land (including the identity of the agency with jurisdiction over that land), tribal land, cities, counties, agencies with water management responsibilities, and areas covered by relevant general plans.
- (4) Existing land use designations and the identification of water use sector and water source type.
- (5) The density of wells per square mile, by dasymetric or similar mapping techniques, showing the general distribution of agricultural, industrial, and domestic water supply wells in the basin, including de minimis extractors, and the location and extent of communities dependent upon groundwater, utilizing data provided by the department, as specified in section 353.2, or best available information.

This section provides a description of the Salinas Valley Groundwater Basin and its subbasins, including the 180/400 Foot Subbasin. Special emphasis is placed on the area to which this Groundwater Sustainability Plan (GSP) applies, which is the Marina Groundwater Sustainability Agency jurisdiction (the MGSA Area), and vicinity. The description includes cities and geographic features, disadvantaged communities (DACs), land use, federal and state parks and wildlife areas, and locations of groundwater wells. The section also describes existing groundwater and surface water monitoring programs, existing water management programs, general and specific land use plans, and other agreements or programs applicable to the MGSA Area. Additional GSP components are summarized as required, as well as information relating to notification and communication by MGSA with other agencies and interested parties.

2.1 SUMMARY OF JURISDICTIONAL AREA AND OTHER FEATURES

2.1.1 PLAN AREA AND JURISDICTIONS

Regulation Requirements:

§354.8(b) A written description of the Plan area, including a summary of the jurisdictional areas and other features depicted on the map.

2.1.1.1 PLAN AREA COVERED BY THE GSP

The Salinas Valley Groundwater Basin includes nine groundwater subbasins designated by the California Department of Water Resources (DWR) in Bulletin 118 (DWR 2004) and shown on Figure 2-1, including the 180/400 Foot Subbasin, East Side Aquifer Subbasin, Forebay Aquifer Subbasin, Upper Valley Aquifer Subbasin, Langley Area Subbasin, Monterey Subbasin, Seaside Subbasin, Atascadero Area Subbasin, and Paso Robles Area Subbasin. The MGSA Area covers 372 acres at the western end of the 180/400 Foot Subbasin, which encompasses an area of approximately 84,400 acres (Figure 1-3). The MGSA Area lateral limits are the Marina City Limits on the north and east, and the 180/400 Foot Aquifer Subbasin boundary on the west and south. The western boundary coincides with the mean high tide line of the

Pacific Ocean. The MGSA Area includes Assessor Parcel Numbers (APN) APN 203-011-001; APN 203-011-019; and APN 203-011-020.

Individual GSPs are being developed cooperatively for four subbasins under Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) jurisdiction in Monterey County, including the East Side Aquifer, Forebay Aquifer, Upper Valley Aquifer, and Langley Area Subbasins. The Monterey Subbasin abuts the 180/400 Foot Aquifer Subbasin and the MGSA Area to the south and is under SVBGSA and Marina Coast Water District (MCWD) GSA jurisdiction (Figure 2-2). It has been subdivided into the Corral de Tierra, Ord, and Marina Subareas. SVBGSA has entered into a Framework Agreement with MCWD GSA to prepare a single GSP for the Monterey Subbasin. SVBGSA will develop information for the Corral de Tierra Subarea and MCWD GSA will develop information for the Ord Subarea and the Marina Subarea, including the portion of the Monterey Subbasin that shares a boundary with MGSA (SVBGSA 2018b, MCWD 2018). A GSP is not being prepared for the Seaside Subbasin because it is adjudicated. Submittal of Alternative Plans is not being proposed for any of the subbasins of the Salinas Valley Groundwater Basin.

The 180/400 Foot Aquifer Subbasin will be managed by three GSAs under two GSPs. The three GSAs with jurisdiction in the Subbasin are MGSA, SVBGSA, and MCWD GSA, whose jurisdictional area extends into the Subbasin in the northern portions of its service area. The portion of the 180/400 Foot Aquifer Subbasin that lies within the MGSA Area will be managed under this GSP. The portion of the Subbasin that lies outside the MGSA Area will be managed under the more regional SVBGSA GSP. Although MCWD agreed that SVBGSA would prepare the GSP for the 180/400 Foot Aquifer Subbasin, including its jurisdictional area, the parties agreed to actively consult with each other and review draft work products during the GSP development process for the 180/400 Foot Aquifer Subbasin.

Figure 2-3 shows the City of Marina (City of Marina) boundaries and key geographic features in the vicinity of the MGSA Area. The MGSA Area lies entirely within the city limits of the City and occupies an approximately 400-acre extension of the City along the coast west of State Highway 1 and south of the Salinas River. Marina is a community of approximately 20,000 residents and is known for its unique Flandrian sand dunes and many protected wildlife species within its coastal areas. Several other communities are located in the vicinity of Marina. Seaside is on Highway 1 about 2 miles south of Marina and has a population of approximately 34,000. Moss Landing, with a population of 200, is about 10 miles north of Marina on Highway 1 at the mouth of Elkhorn Slough, which is one of the largest wetlands in California. Castroville is an agricultural community of about 6,000 people located 10 miles north of Marina and 5 miles east of Moss Landing on State Route 183 in the Salinas Valley. Salinas, also an agricultural community, is in the Salinas Valley about 6 miles east of Marina on Highway 101 and has a population of approximately 155,000.

Figure 2-3 shows the DACs in the Salinas Valley area near Marina. DWR defines DACs as census geographies with an annual median household income (MHI) that is less than 80 percent of the statewide annual MHI. Severely disadvantaged communities (SDACs) are defined as census geographies with an MHI less than 60 percent of the statewide annual MHI. DWR uses the most recently available

five-year American Community Survey (ACS) dataset to identify these areas. DWR’s DAC Involvement Program is designed to ensure the involvement of DACs in Integrated Regional Water Management (IRWM) planning efforts. Under Proposition 1, grant funding is available for implementation of water management activities that provide benefits to DACs. Marina has several DAC areas within its boundaries and residents in those DACs utilize and recreate in beach, dune, and coastal habitat areas within the MSGA Area. There are no DAC areas within the MSGA Area.

2.1.1.2 FEDERAL, STATE, AND LOCALLY MANAGED LANDS AND PROTECTED AREAS

The MSGA Area lies entirely within the City of Marina. It lies outside the jurisdictional boundaries of any water agencies or utility service districts. There are no federal or state lands within the MSGA Area. The entire MSGA Area is located within the designated Coastal Zone under the California Coastal Act. The City has approval and regulatory authority over all development in this Coastal Zone pursuant to its certified Local Coastal Program (LCP). This authority includes revisions to its LCP and the issuance of coastal development permits.

Federal, state, and locally managed lands and protected areas in the vicinity of the MSGA Area are shown in Figure 2-4 and described below:

- **Federal Jurisdiction.** A portion of the Fort Ord former Army base is within the 180/400 Foot Aquifer Subbasin southeast of the MSGA Area. Although DWR land use dataset depicts this as federal land, most of these lands have been transferred to non-federal entities for reuse. The United States Fish and Wildlife Service (USFWS) manages the Salinas River National Wildlife Refuge north of the MSGA Area. The National Oceanic and Atmospheric Administration (NOAA) manages the Monterey Bay National Marine Sanctuary, which is a federally protected marine preserve that stretches along the central coast from San Francisco to Cambria and includes beaches, tide pools, kelp forests, an underwater canyon, and other marine features.
- **State Jurisdiction.** The California Coastal Commission retains some authority under the California Coastal Act for protection of coastal resources, shoreline public access and recreation. The California Department of Parks and Recreation (PARKS) manages Marina State Beach, which is a protected beach within the Marina City Limits that winds through the Marina Dunes Natural Preserve and Fort Ord Dunes State Park, which is south of Marina State Beach outside the Marina City limits. PARKS also has jurisdiction over the Salinas River State Beach, Moss Landing State Beach, Salinas River Dunes Natural Preserve, and the Salinas River Mouth Natural Preserve.
- **County Jurisdiction.** The MSGA Area and the entire 180/400 Foot Aquifer Subbasin lie within Monterey County; and the County has land use jurisdiction over unincorporated County areas near the MSGA Area.
- **Monterey County Water Resources Agency Jurisdiction.** Originally established in 1947 as the Monterey County Flood Control and Water Conservation District in response to concerns about seawater intrusion and flooding in the Salinas Valley, the name of the agency was changed to the Monterey County Water Resources Agency (MCWRA) under Senate Bill 2580 in January 1991

to more accurately reflect its powers and functions (Monterey County 2019). In addition to flood plain management and emergency flood-related preparedness, MCWRA has specified jurisdiction over matters pertaining to water and water supply within the entire Monterey County area, including both incorporated and unincorporated areas under the Monterey County Water Resources Agency Act (Agency Act). MCWRA is authorized to conserve water in any manner; to buy, sell, and purvey water; and to prevent the waste or diminution of the water supply including control of groundwater extractions to prevent the loss of usable groundwater through seawater intrusion.

Groundwater level measurement programs in the Salinas Valley began in the 1940s to investigate the cause and extent of seawater intrusion. By monitoring groundwater levels throughout the Salinas Valley over time, MCWRA tracks storage changes and provides an ongoing assessment of the ability of groundwater supplies to meet pumping demands. In 1992, MCWRA established several zones (Zones 2, 2A, 2B, 2Y, and 2Z) to institute water supply projects and collect assessments to fund them under various Monterey County Ordinances (MCWRA 2019c). The MGSA Area is within Zone 2C, which covers 436,000 acres and was established in 2003 to collect assessments for operations and maintenance of the Nacimiento and San Antonio Dams, but is not within any other MCWRA established management zones. Monterey County Ordinance No. 3717 requires water suppliers within Zones 2, 2A, and 2B to report water-use information for groundwater extraction wells to MCWRA. Several Ordinances (Nos. 3709 and 3790) have been enacted by MCWRA to reduce groundwater extractions and to regulate wells within portions of the Castroville Seawater Intrusion Project (CSIP) area (Figure 2-6). MCWRA collaborates with the Monterey County Health Department during the application and review process for permitting new water supply wells. Under annexation agreements, the MCWRA has specified authority to allocate groundwater in the Central Marina and Ord Community service areas, which are shown on Figure 2-5.

- **City and Water Agency Jurisdiction.** The City of Marina has land use and water management authority within the incorporated area of the City, including the MGSA Area. The land use designation of “Habitat Preserve and Other Open Space” in the General Plan (City of Marina 2011), takes precedence over the zoning designation. The current zoning of the MGSA Area is “Coastal Conservation and Development.” A zoning map amendment is in progress to change the zoning to “Open Space.”

MCWD provides potable water service to approximately 33,000 residents within its jurisdictional boundaries, including the City of Marina. The Central Marina service area encompasses 3.2 square miles, and its sphere of influence encompasses an additional 2.4 square miles. The Ord Community service area encompasses 8.7 square miles. Three of MCWD’s wells are located in Central Marina and five wells are in the Ord Community. MCWD’s jurisdictional area also includes the Ord Development parcels (approximately 6 square miles). Portions of MCWD’s Central Marina and Ord Community service areas extend into the 180/400 Foot Aquifer Subbasin as shown on Figure 2-5 and MCWD GSA has jurisdiction to administer the

requirements of SGMA over those areas. MCWD’s jurisdictional boundaries do not include the MGSA Area.

- **Pure Water Monterey and Castroville Seawater Intrusion Projects.** The CSIP system is owned by MCWRA but operated by Monterey Regional Water Pollution Control Agency (MRWPCA), now Monterey One Water (M1W). CSIP is the distribution system for recycled wastewater produced by the Regional Treatment Plant and consists of 45 miles of pipelines and 22 wells. The CSIP supplies a combination of recycled water, Salinas River water, and Salinas Valley groundwater for irrigation of 12,000 acres of farmland in its jurisdictional area near and southwest of Castroville (Figure 2-6). The Pure Water Monterey (PWM) Groundwater Replenishment (GWR) Project, proposed by M1W in partnership with Monterey Peninsula Water Management District (MPWMD), will increase the amount of recycled water available to the CSIP system for crop irrigation within the CSIP service area and will also provide 3,500 acre-feet per year (AFY) of potable water for the Monterey Peninsula communities to the south of the City.
- **Parks, Preserves, and Other Protected Areas.** Several other entities support local, state, and federal water management and/or natural habitat management partners in the vicinity of the MGSA Area. The active dunes underlying the MGSA Area are part of the more extensive Monterey Dunes, which extend from Monterey Harbor north to the Salinas River mouth. Monterey Peninsula Regional Park District (MPRPD) manages the Marina Dunes Natural Preserve, which is a narrow strip of land consisting of coastal strand and dune habitat (Figure 2-4). A large area of environmentally sensitive habitat is located along the coast in the Marina Dunes Preserve and to the north in the Marina Dunes (MRPD 2005).

MPRPD also manages Locke-Paddon Wetland Community Park, which is a 17-acre wetland area that holds a freshwater “vernal pond” that provides habitat for a range of avian wildlife within the City of Marina. Acquisition of the last remaining private parcel bordering the pond is currently underway by MRPD and will complete a 15-year effort that will also begin the final phase of its original goal – enhancement and restoration of the ponds as critical coastal wetland habitat. As described in Section 3.2.6.1.2, there are six vernal pond areas in the vicinity of Marina, including similar palustrine and emergent wetland features east of the MGSA Area, which were evaluated using procedures recommended by The Nature Conservancy and identified as likely GDEs. Although groundwater-level data were not available for the vicinity of Locke-Paddon Wetland Community Park, it appears to be in a similar setting and may also be a GDE.

Appendix 2.A provides the results from the California Natural Diversity Database (CNDDDB) query including maps of species occurrences and a species list. Section 2.2.5 describes critical habitat zones that have been mapped within the MGSA Area and vicinity.

2.1.2 LAND USE

Figure 2-7 shows the land use in the vicinity of the MGSA Area. Land use patterns surrounding the MGSA Area are dominated by agriculture in the Salinas Valley to the east, and open space (conservation) to the north and south. Mixed use urban developments associated with the City of Marina are located to the southeast. The top three crops by value in Monterey County in 2018 were lettuce, strawberries, and broccoli (Monterey County 2018). Other crops included tomatoes, spinach, cauliflower, wine grapes, artichokes, and celery.

The MGSA Area is located outside the Urban Growth Limits of the City of Marina and has a land use designation of “Habitat Preserve and Other Open Space” (City of Marina 2011). It is zoned “Coastal Conservation and Development;” however, an amendment to change the zoning to “Open Space” is in progress and will require approval of the California Coastal Commission. Marina covers an area of 10 square miles and is sheltered from Monterey Bay by coastal sand dunes. Approximately 2 square miles of the City and 3 miles of coastline are within the California Coastal Zone with a designated land use of Coastal Conservation and Development in the local Coastal Plan (City of Marina 2013a, 2013b, 2019). The Coastal Zone and City of Marina boundaries and urban areas, as well as parks, preserves, rivers, ponds, and protected areas, are shown on Figure 2-4. The coastal area of the city is generally divided north and south by Reservation Road. The predominant coastal use in the area to the south of Reservation Road is state beach. To the north, within the MGSA Area, the ownership is private, and the primary current use is sand mining, chiefly from the tidal zone but also from the dunes.

Figure 2-8 shows the existing surface conditions within the MGSA Area, which are predominantly dune sands. There are four artificial ponds within the MGSA Area on the CEMEX plant site that were constructed to support industrial operations: a dredge pond and three percolation ponds for saline process water. The MGSA Area is characterized by Flandrian dune habitat on dunes formed at the end of the last Ice Age (WRA 2018). Flandrian dune habitat is protected under federal, state, and local jurisdiction in accordance with the California Coastal Act. These dunes are highly vulnerable to wind and wave erosion, and plants established on the dunes can withstand loose shifting soils and harsh conditions. This coastal dune habitat supports seven special-status plant species and is associated with certain special-status animal species (WRA 2018).

The MGSA Area is comprised of Primary and Secondary Habitat as defined under the City of Marina LCP (City of Marina 2013a), which are considered Environmentally Sensitive Habitat Areas (ESHAs) that are designated protected areas within the Coastal Zone of California under the California Coastal Act. Primary Habitat includes:

- “1. Habitat for all identified plant and animal species which are rare, endangered threatened, or are necessary for the survival of an endangered species.
2. Vernal ponds and their associated wetland vegetation.

3. All native dune vegetation, where such vegetation is extensive enough to perform the special role of stabilizing Marina’s natural sand dune formations.
4. Areas otherwise defined as Secondary Habitat that have an especially valuable role in an ecosystem for sensitive plant or animal life, as determined by a qualified biologist approved by the City [Resolution No. 2001-118 (October 16, 2001); approved by the California Coastal Commission on November 14, 2001].”

The Coastal Act requires that ESHAs “shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas” (Public Resources Code, § 30240(a)). Similarly, the Marina LCP limits development in Primary Habitat.

State and federally protected species that have been observed within the MGSA Area or have moderate or high potential to occur are listed in Table 2-1.

TABLE 2-1. STATE OR FEDERALLY PROTECTED SPECIES WITH POTENTIAL TO OCCUR WITHIN THE MGSA AREA

Species	Federal/State Status	MGSA Area
Monterey spineflower (<i>Chorizanthe pungens</i> var. <i>pungens</i>)	Federally threatened	Observed
Robust spineflower (<i>Chorizanthe robusta</i>)	Federally endangered	Moderate potential
Seaside birds-beak (<i>Cordylanthus rigidus</i>)	State endangered	Moderate potential
Menzies’ wallflower (<i>Erysimum menziesii</i>)	Federally endangered State endangered	Moderate potential
Sand gilia (<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>)	Federally endangered State threatened	High potential
Smith’s blue butterfly (<i>Euphilotes enoptes smithi</i>)	Federally endangered	High potential
Western snowy plover (<i>Charadrius nivosus nivosus</i>)	Federally threatened California Species of Special Concern	Observed

Source: WRA (2018) Review of Biological Resources Components of the Coastal Development Permit Application for the Monterey Peninsula Water Supply Project

Exhibit A of the Marina Local Coastal Land Use Plan (LCLUP), which is part of the LCP, lists a number of other special-status plant and animal species that have been observed or have a moderate to high potential to occur within the MGSA Area including the globose dune beetle (*Coelus globosus*), California legless lizard (*Anniella pulchra*), Salinas kangaroo rat (*Dipodomys heermanni goldmani*), seaside painted cup (*Castilleja latifolia* ssp. *latifolia*), Eastwood’s ericameria (*Ericameria fasciculata*), coast wallflower (*Erysimum ammphilum*), coastal dunes milkvetch (*Astragalus tener* var. *titi*), dune gilia (*Gilia tenuiflora*)

var. arenaria), wild buckwheat (*Eriogonum latifolium*, *Eriogonum parvifolium*),¹ and the bush lupine (*Lupinum ssp.*)² (City of Marina 2013a).

Marina has been involved in decades of efforts to end the current sand mining activities in the MSGA Area, which have proven to be a very environmentally destructive use for these coastal resources. In 2017, after combined enforcement actions by the California Coastal Commission, the State Lands Commission, and the City, a comprehensive settlement agreement was entered into with RMC Pacific Minerals, doing business as CEMEX, to end this sand mining by December 31, 2020. RMC is thereafter required to fully reclaim and restore the site.

The settlement also requires CEMEX to transfer the entire site, including the area where the slant wells would be located, at a reduced purchase price to a non-profit organization or government entity approved by the Coastal Commission and the City. As part of this conveyance, a deed restriction will be put in place to protect the property and limit its potential uses to public access, conservation, low-impact passive recreation, and public education. These provisions will improve public access and enjoyment of the property, and will provide many benefits to site habitats.

2.1.3 WATER USE AND SOURCES

Three water supply sources are available in the 180/400 Foot Aquifer Subbasin: groundwater, surface water, and recycled water. Groundwater is the primary water source for all water use sectors in the Subbasin. Municipal areas that depend on groundwater in the vicinity of the MGSA Area are shown on Figure 2-6. Urban demand in the vicinity of the MGSA Area is met solely by groundwater. MCWD supplies water to Central Marina and the Ord Community service areas from groundwater in the 180/400-Foot Aquifer and Deep Aquifer. From 2000 to 2014 (pre-drought average), MCWD delivered about 2,300 AFY of water from the 180/400-Foot Aquifer and 2,000 AFY of water from the Deep Aquifers underlying the Monterey and 180/400 Foot Subbasin to its customers in the Central Marina service area (MCWD 2019c). In 2018, MCWD delivered about 1,100 AFY from the 180/400-Foot Aquifer and 2,300 AFY from the Deep Aquifer (MCWD 2019c). MCWD entered into an agreement with M1W to provide up to 1,427 AFY of reclaimed water from their Advanced Water Treatment Facility via the PWM pipeline for delivery to their Ord Community service area customers for commercial irrigation and other uses as part of the Regional Urban Water Augmentation Program (RUWAP, MCWD 2019b).

Although groundwater is also used for agricultural and rural residential domestic supply, small community systems, schools, and small commercial operations, the seawater intruded area on the northwestern side of the Subbasin (where the MGSA Area is located) receives a combination of recycled water, surface water, and groundwater from the Deep Aquifers as part of a conjunctive use strategy intended to decrease groundwater dependence in the seawater intruded area (refer to Section 2.2.10). In the region surrounding the MGSA Area, water from the Salinas Valley Reclamation Project is used on farmland in the CSIP service area, which is shown on Figure 2-6 (Brown and Caldwell 2015). This includes land immediately east of the MGSA Area. The Salinas River Diversion Facility (SRDF) also

¹ Only within the range of Smith's blue butterfly.

² Only within the range of the California legless lizard.

provides treated river water to cropland in this area, which reduces the need to pump groundwater except during periods of high demand.

Figure 2-9, Figure 2-10, and Figure 2-11 show the density of domestic, municipal, and production wells per square mile in the vicinity of the MGSA Area, as available from the DWR Well Completion Report Map Application (DWR 2019a). Domestic wells are largely private residential wells. Municipal wells, or public supply wells, are the primary water source for urban and rural communities. Production wells are used primarily for agricultural irrigation and the remainder for industrial purposes. In the Pressure Subarea of the Salinas Valley Groundwater Basin, which includes the 180/400 Foot Aquifer Subbasin and the Monterey Subbasin, approximately 88% of the groundwater pumped is for agricultural use and 12% is for domestic and municipal use combined (MCWRA 2017b). The well count within the MGSA Area is summarized in Table 2-2. CEMEX has two production wells at the CEMEX Lapis Plant sand mine site. One well is active, and the second CEMEX well has collapsed casing and cannot be used without re-drilling. A test slant well was constructed to test the feasibility of a subsurface groundwater supply for a desalination plant as part of California American Water Company’s (CalAm’s) proposed Monterey Peninsula Water Supply Project (MPWSP). This well is currently scheduled to be closed in 2020 pursuant to the permit issued for it by the California Coastal Commission.

TABLE 2-2. MGSA AREA WELL COUNT SUMMARY

Category	Number of Wells
Domestic	0
Municipal (MPWSP Test Slant Well)	1
Industrial (CEMEX)	2
Total	3

Source: DWR (2019) Well Completion Report Map Application

2.2 WATER RESOURCES MONITORING AND MANAGEMENT PROGRAMS

Regulation Requirements:

§354.8(c) Identification of existing water resource monitoring and management programs, and description of any such programs the Agency plans to incorporate in its monitoring network or in development of its Plan. The Agency may coordinate with existing water resource monitoring and management programs to incorporate and adopt that program as part of the Plan.

§354.8(d) A description of how existing water resource monitoring or management programs may limit operational flexibility in the basin, and how the Plan has been developed to adapt to those limits.

§354.8(e) A description of conjunctive use programs in the basin.

The existing water resources monitoring and management programs within and surrounding the MGSA Area are a collection of local, regional, state, and federal programs, each serving its own specific function. Existing monitoring within the Subbasin is performed for a variety of purposes by a variety of entities. This collection of programs will provide data to assist in meeting monitoring needs under the Sustainable Groundwater Management Act (SGMA); however, as pointed out in the SVBGSA GSP

(SVBGSA 2019), some redundancies, inconsistent protocols, and variable timing of monitoring will need to be improved during SGMA implementation. Data from the following agencies and programs is potentially relevant to groundwater management in the 180/400 Foot Aquifer Subbasin:

Statewide Monitoring Programs (Agencies and Databases):

- California Data Exchange Center (CDEC)
- California Department of Pesticide Regulation (CDPR)
- California Environmental Data Exchange Network (CEDEN)
- California State Water Resources Control Board (SWRCB)
 - GeoTracker GAMA
 - Division of Drinking Water (DDW)
- Department of Water Resources (DWR)
 - California Statewide Groundwater Elevation Monitoring (CASGEM)
 - California Statewide Groundwater Elevation Monitoring Groundwater Information Center Interactive Mapping Application (GICIMA)
 - Water Data Library (WDL)
 - Online System for Well Completion Reports (OSWCR)
 - SGMA Data Viewer
- United States Geological Survey (USGS)
 - Water Resources Information System
 - Groundwater Ambient Monitoring and Assessment Program (GAMA)

Regional Monitoring Programs:

- Monterey Peninsula Water Management District (MPWMD)
 - Irrigated Lands Regulatory Program (ILRP)
- Monterey Peninsula Groundwater Replenishment Program (GWR)

Local Monitoring Agencies and Companies:

- Monterey County Water Resources Agency (MCWRA)
- United States Army (Army) Fort Ord
- Marina Coast Water District (MCWD)
- Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA)
- California American Water Company (CalAm)
- City of Marina

See Section 2.2.1 and Chapter 5 (Monitoring Networks) for a description of the monitoring programs that will be used in implementation of the MGSA GSP.

2.2.1 GROUNDWATER LEVEL MONITORING

2.2.1.1 MCWRA GROUNDWATER LEVEL MONITORING

MCWRA has responsibility to monitor groundwater levels, collect water quality data, and collect pumping data in order to inform efforts to address seawater intrusion in the Salinas Valley Groundwater Basin. Based on information posted on the MCWRA Groundwater Level Monitoring webpage (MCWRA 2019b), the agency collects the following groundwater level monitoring data:

- MCWRA collects monthly groundwater level measurements at more than 90 wells throughout the Salinas Valley. Of these wells, 38 are in the Subbasin, and one well is located southwest of the Salinas River within approximately 2 miles of the MGSA Area, which is the general area of interest with respect to collection of groundwater level data that are relevant to the MGSA Area. MCWRA processes these monthly measurements to develop a computed average of depth to water.
- Each fall, MCWRA collects annual groundwater level measurements from approximately 450 wells in the Salinas Valley Groundwater Basin. Of these, 120 wells are in the Subbasin, and one well is located southwest of the Salinas River within approximately 2 miles of the MGSA Area. MCWRA uses these annual measurements to develop contour maps depicting the groundwater table elevation.
- MCWRA collects groundwater level measurements every August at approximately 150 wells in the Subbasin, and one well is located southwest of the Salinas River within approximately 2 miles of the MGSA Area to establish the location and extent of groundwater pumping depressions that drive seawater intrusion. The August measurements usually coincide with the end of the irrigation season, and groundwater levels at this time reflect low groundwater elevations before the onset of seasonal winter recharge. These pumping depressions occur in the Pressure 180-Foot and Pressure 400-Foot Aquifers between the City of Salinas and the coast. MCWRA uses the August groundwater elevation data to develop groundwater contour maps of the coastal pumping depressions in odd-numbered years.

2.2.1.2 CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING

MCWRA is the responsible monitoring entity for the California Statewide Groundwater Elevation Monitoring (CASGEM) Program in Monterey County. The monitoring network comprises 51 wells throughout the Salinas Valley, which are a subset of the wells monitored by MCWRA described in the previous section. Of these wells, 23 are in the Subbasin, and one is located within approximately 2 miles of the MGSA Area. Some of the CASGEM monitoring wells are CASGEM compliance wells and others are “voluntary wells” that are not officially part of the CASGEM program. MCWRA collects quarterly groundwater elevation data from the CASGEM wells and reports the groundwater elevation data to DWR twice per year. Figure 2-12 shows the locations of the CASGEM monitoring wells in the MGSA Area and local vicinity.

2.2.1.3 PROPOSED MONTEREY PENINSULA WATER SUPPLY PROJECT (MPWSP) MONITORING

CalAm currently proposes to complete a series of slant wells within the MGSA Area to serve as a source water intake for its MPWSP desalination project. This project is in the process of applying for permits from local, state, and federal agencies, and therefore may or may not be fully approved. There are currently eight monitoring well clusters with 24 wells within and near the MGSA Area that were installed in 2015 to monitor test slant well pumping for MPWSP design and environmental studies (HWG 2017). Each of these clusters has a well completed in the Dune Sand Aquifer (DSA), the 180-Foot Aquifer, and the 400-Foot Aquifer. The existing clusters are designated MW-1, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9 (the MW-2 cluster was not constructed).³

Pursuant to the Mitigation Monitoring and Reporting Program (MMRP) for MPWSP, MCWRA will take over monitoring of these wells to augment its existing regional groundwater monitoring network to focus on the area that could be affected by the proposed slant wells. Under the MMRP for the proposed MPWSP, MCWRA will construct five additional well clusters with three wells each at locations MW-A, MW-B, MW-C, MW-D, and MW-E, and construct another well at MW-5S screened in the DSA below a perched zone, to expand the network of nested monitoring wells to a total of 40 wells (Zidar and Feeny 2019). The locations of these existing and proposed wells are shown in Figure 2-13. In addition, under the MMRP, MCWRA will monitor a number of other existing wells in the vicinity of the MGSA Area that are in the MCWRA, MCWD, or Fort Ord monitoring networks, including 10 wells completed in the DSA, eight wells completed in the 180-Foot Aquifer, five wells completed in the 400-Foot Aquifer, and eight wells completed in the Deep Aquifer. MCWRA will also monitor six nested monitoring wells in the Deep Aquifer constructed by the United States Geological Survey (USGS) at two locations approximately ½-mile south of the MGSA Area. Groundwater levels are monitored in the existing wells on a quarterly basis and recorded continuously using pressure transducers.

It should be noted that MGSA is currently developing an agreement with MCWRA which includes, among other things, a provision that should the MPWSP not move forward, MCWRA, MGSA and other agencies with jurisdiction in the area will work together to develop and implement a suitable monitoring program in the nearshore area of the Subbasin.

2.2.2 GROUNDWATER EXTRACTION MONITORING

MCWRA collects groundwater extraction information from all wells in the Subbasin that have discharge pipes of three inches or greater in diameter. These data have been collected since 1993. Extraction is self-reported by well owners and summarized by MCWRA in annual Groundwater Extraction Summary Reports. The most recent report available on the MCWRA website is the 2015 report, which was finalized in April 2017 (MCWRA 2017b). Extraction data are available for the CEMEX wells in the MGSA Area, which extract groundwater from the 180-Foot and 400-Foot Aquifers. An additional irrigation well

³ Monitoring data indicate that MW-5S is screened in a perched aquifer above the DSA. Therefore, the monitoring well has been re-designated as MW-5S(P) to indicate that it is representative of a local perched aquifer. Similarly, MW-6D is screened in the lower portion of the 180-Foot Aquifer and has been re-designated as MW-6M(L) to indicate that it represents the 180-Foot Aquifer.

that extracts groundwater from the Deep Aquifer is located within approximately 1.4 miles of the MGSA Area.

2.2.3 GROUNDWATER QUALITY MONITORING

2.2.3.1 PROPOSED MONTEREY PENINSULA WATER SUPPLY PROJECT MONITORING

The monitoring well clusters installed within and near the MGSA Area for the proposed MPWSP are used to collect quarterly water quality data. In addition, specific conductance sensors have been deployed in the wells to monitor conductivity (correlated with salinity) continuously. As discussed above, MCWRA will assume monitoring responsibility for these wells and plans to install five additional monitoring well clusters at the locations shown on Figure 2-13.

2.2.3.2 MCWRA SEAWATER INTRUSION MONITORING

MCWRA monitors seawater intrusion in the Salinas Valley with a network of 121 monitoring wells in the Subbasin. Of those, 96 wells are agricultural production wells that are sampled annually in June and August (during peak pumping), and 27 wells are dedicated monitoring wells that are owned by MCWRA and monitored at regular intervals. Water quality samples from the wells are analyzed for major anions and cations, and conductivity. The data are used to develop time-series plots of chloride and conductivity trends, to create Stiff and Piper diagrams, and to compute molar ratios of chloride to sodium. The data are also used to prepare maps of seawater intrusion in the 180-Foot and 400-Foot Aquifers in odd-numbered years. Additional information about the occurrence and extent of seawater intrusion in both the 180-Foot and 400-Foot Aquifers is provided in Section 3.2.3.

2.2.3.3 OTHER PROGRAMS

Groundwater quality is monitored under several different programs and by different agencies as follows:

- Municipal and community water purveyors, such as MCWD, collect water quality samples on a routine basis for compliance monitoring and reporting to California DDW.
- USGS collects water quality data on a routine basis under the GAMA Program. These data are accessible in the SWRCB GeoTracker GAMA database, which also includes data from other water quality monitoring programs. Figure 2-14 shows the location of wells in the California GAMA GeoTracker database for which water quality data are available within the Subbasin in the vicinity of the MGSA Area. One well is located within approximately 2 miles of the MGSA Area.
- The Army conducts groundwater quality monitoring in the “A-Aquifer” (the local equivalent of the DSA) and 180-Foot Aquifer at Fort Ord.
- Multiple sites are monitoring groundwater quality as part of investigation or compliance monitoring programs through the Central Coast Regional Water Quality Control Board (CCRWQCB).

2.2.4 SURFACE WATER MONITORING

Streamflow gages operated by the USGS in the vicinity of the MGSA Area include the following:

- Reclamation Ditch near Salinas (USGS Site #11152650)
- Salinas River near Spreckels (USGS Site #11152500)

Water levels (stage) in the Salinas River Lagoon are measured by MCWRA at Monte Road and near the slide gate to the Old Salinas River. Monitoring river flow allows MCWRA to manage reservoir releases as well as operations at the SRDF throughout the year. The locations of the surface-water monitoring gages are depicted in Figure 2-15.

2.2.5 WILDLIFE PRESERVE AND CRITICAL HABITAT MONITORING

National wildlife refuges, coastal preserves, sensitive habitats, and critical riparian and aquatic habitat areas are managed and monitored under the oversight of the relevant agencies (United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and local entities, which conduct monitoring as necessary. Critical habitat for Western snowy plover exists along the western shoreline of the MGSA Area, extending to the north and south (USFWS 2019). Critical habitat for tidewater goby (*Eucyclogobius newberryi*) lies to the north within the Salinas River National Wildlife Refuge and mouth of the Salinas River. MGSA will coordinate GSP implementation, monitoring, and management efforts with these responsible agencies as necessary to avoid the occurrence of undesirable results.

2.2.6 EXISTING WATER MANAGEMENT PROGRAMS AND PLANS

2.2.6.1 MONTEREY COUNTY GROUNDWATER MANAGEMENT PLAN

MCWRA developed a Groundwater Management Plan (GMP) that is compliant with Assembly Bill (AB) 3030 and Senate Bill (SB) 1938 legislation (MCWRA 2006) and covers the Salinas Valley Groundwater Basin in Monterey County (exclusive of the Seaside and Paso Robles Subbasins). In the 180/400 Foot Subbasin, this GMP will be superseded by this GSP and by the SVBGSA GSP covering the remainder of the Subbasin. The GMP is predicated in the finding that management of the County's natural water resources is critical to ensuring a long-term sustainable, reliable, and good quality water supply, and includes objectives and plan elements that are incorporated into these GSPs.

The GMP identifies three groundwater management objectives:

- Objective 1: Development of Integrated Water Supplies to Meet Existing and Projected Water Requirements;
- Objective 2: Determination of Sustainable Yield and Avoidance of Overdraft; and
- Objective 3: Preservation of Groundwater Quality for Beneficial Use.

To accomplish these objectives, the GMP identifies 14 elements that include a number of effective ongoing water management activities and new activities for expanded conjunctive use of supplemental

surface water and recycled water with groundwater. The elements reflect the wider focus on groundwater management, which includes continued cooperation among groundwater suppliers and groundwater users in the basin. Plan elements to be implemented by MCWRA include the following:

- Plan Element 1: Monitoring of Groundwater Levels, Quality, Production, and Subsidence;
- Plan Element 2: Monitoring of Surface Water Storage, Flow, and Quality;
- Plan Element 3: Determination of Basin Yield and Avoidance of Overdraft;
- Plan Element 4: Development of Regular and Dry Year Water Supply;
- Plan Element 5: Continuation of Conjunctive Use Operations;
- Plan Element 6: Short-Term and Long-Term Water Quality Management;
- Plan Element 7: Continued Integration of Recycled Water;
- Plan Element 8: Identification and Mitigation of Groundwater Contamination;
- Plan Element 9: Identification and Management of Recharge Areas, Wellhead Protection Areas;
- Plan Element 10: Identification of Well Construction, Abandonment, and Destruction Policies;
- Plan Element 11: Continuation of Local, State, and Federal Agency Relationships;
- Plan Element 12: Continuation of Public Education and Water Conservation Programs;
- Plan Element 13: Groundwater Management Reports; and
- Plan Element 14: Provisions to Update the Groundwater Management Plan.

2.2.6.2 INTEGRATED REGIONAL WATER MANAGEMENT PLAN

The Greater Monterey County Integrated Regional Water Management Plan (IRWMP) was developed by the Greater Monterey County Regional Water Management Group (RWMG) (RWMG 2018), which consists of government agencies, nonprofit organizations, educational organizations, water service districts, private water companies, and organizations representing agricultural, environmental, and community interests. The MGSA Area of the Subbasin falls within the IRWMP area.

Goals and objectives identified by RWMG as critical to address water resource issues within the IRWMP area encompass the following:

- Water supply;
- Water quality;
- Flood protection and floodplain management;
- Environment;
- Regional communication and cooperation;
- DACs; and
- Climate change.

The IRWMP includes more than 25 projects related to regional groundwater management.

2.2.6.3 MCWD URBAN WATER MANAGEMENT PLAN

The MCWD Urban Water Management Plan (UWMP) (Schaaf & Wheeler 2016) describes MCWD’s service area; reports historical and projected populations; identifies historical and projected water demand by category (single-family, multi-family, commercial, industrial, institutional/government, and other); identifies water supplies, and describes the distribution system and associated losses. MCWD currently relies solely on groundwater. MCWD has two separate service areas: Central Marina, which encompasses the portion of the City of Marina outside former Fort Ord, and the Ord Community. There are three municipal water production wells in the Central Marina service area completed in the 900-Foot Aquifer (Deep Aquifer). Five municipal production wells are located in the Ord Community service area, three completed in the lower 180/400-Foot Aquifer (Wells 29, 30, and 31), one in the 400-Foot/Deep Aquifer (Well 35), and one in the Deep Aquifer (Well 34) (MCWD 2019b). MCWD also has a small seawater desalination plant located at its main office adjacent to Marina State Beach. Although the facility is not currently in use, it has a design capacity of 300 AFY (Schaaf & Wheeler 2016).

Water use during 2015 for both the Marina and Ord communities was about 3,200 AFY. Based on estimates in the MCWD UMWP, there will be a shortfall of approximately 3,000 AFY in allocated supplies for MCWD’s combined Central Marina and Ord Community service systems to meet projected demand by 2035. To address the shortfall, MCWD is looking at various methods of enhancing the water supply including stormwater capture, water recycling, desalination, and conservation and efficient use of water. These water supply projects are described in Section 2.2.10. MCWD’s Board of Directors has also considered purchasing surface water rights in the Salinas River Basin as a means of meeting long-term (beyond 2030) demands. In addition, MCWD is conducting a three-party planning process (with Fort Ord Reuse Authority [FORA] and M1W) to identify new water supply options for development in the Fort Ord area (MCWD 2019c). The study began in October 2018 and is anticipated to be completed in early 2020. The study will identify and evaluate water supply alternatives for Fort Ord based on technical/regulatory feasibility, cost/benefit, effectiveness, among a set of criteria that align with the programs’ strategic goal.

2.2.6.4 ANNEXATION AGREEMENTS

In 1993, the United States Government, represented by the Army, and MCWRA entered into an agreement entitled *Annexation of Fort Ord into Zones 2 and 2A of the Monterey County Water Resources Agency* (1993 Annexation Agreement). The purpose of the 1993 Annexation Agreement was to provide terms and conditions under which the Fort Ord Lands could be annexed to MCWRA zones to become part of MCWRA’s regional water supply system and to mitigate the effects of seawater intrusion in the Salinas Valley Basin.

In 1996, the City of Marina and other parties entered into an agreement with RMC Lonestar (the owner of the CEMEX Property that now comprises the MGSA Area) entitled *Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands* (1996 Annexation Agreement). The purpose of the 1996 Annexation Agreement is to “help reduce seawater intrusion and protect the groundwater resource and preserve the environment of the Salinas River Groundwater Basin” and to provide

conditions for annexation of the CEMEX and other properties to MCWRA zones. *Id.* § 1.1. One key Annexation Agreement condition is that “[c]ommencing on the effective date of this Agreement and Framework, Lonestar shall limit withdrawal and use of groundwater from the Basin to Lonestar’s historical use of 500 AFY of groundwater.” *Id.* § 7.2

Under 1993 and 1996 Annexation Agreements, MCWRA allocated groundwater pumping rights of 3,020 AFY to MCWD and the City of Marina, and 6,600 AFY to the Army for the Ord community (Schaaf & Wheeler 2016). Under the 1996 Annexation Agreement, 920 AFY of groundwater was allocated to Armstrong Ranch development, and 500 AFY (of brackish water) to CEMEX in the MGSA Area.

2.2.7 EXISTING GROUNDWATER REGULATORY PROGRAMS

2.2.7.1 GROUNDWATER EXPORT PROHIBITION

The Monterey County Water Resources Agency Act § 52.21 prohibits the export of groundwater from any part of the Salinas Valley Groundwater Basin, including the 180/400 Foot Subbasin. In particular, the Act states:

For the purpose of preserving [the balance between extraction and recharge], no groundwater from that basin may be exported for any use outside the basin, except that use of water from the basin on any part of Fort Ord shall not be deemed such an export. If any export of water from the basin is attempted, the Agency may obtain from the superior court, and the court shall grant, injunctive relief prohibiting that exportation of groundwater.

2.2.7.2 AGRICULTURAL ORDER

In 2017, the CCRWQCB issued Agricultural Order No. R3-2017-0002, a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Agricultural Order). The permit requires that growers implement practices to reduce nitrate leaching into groundwater and improve surface-receiving water quality. Negotiations with the CCRWQCB staff and Board Members for the next iteration of the Agricultural Order are ongoing; they are expected to conclude in March 2020 with the adoption of a new ILRP Waste Discharge Requirement (WDR) for farming operations in the Salinas Valley Groundwater Basin area (and the entire Central Coast region). There is no agricultural land use within the MGSA Area.

2.2.7.3 WATER QUALITY CONTROL PLAN FOR THE CENTRAL COAST BASINS

The Water Quality Control Plan for the Central Coastal Basin (Basin Plan) was most recently updated in September 2017 (CCRWQCB 2017). The objective of the Basin Plan is to outline how the quality of the surface water and groundwater in the Central Coast Region should be managed to provide the highest water quality reasonably possible. The Basin Plan lists beneficial users, describes the water quality that must be maintained to allow those uses, provides an implementation plan, and details SWRCB and CCRWQCB plans and policies to protect water quality and statewide and regional surveillance and monitoring programs. The SWRCB’s Sources of Drinking Water Policy — adopted in Resolution No. 88-63 and incorporated in its entirety into the CCRWQCB’s Basin Plan — provides that water with water quality equal to or less than 3,000 milligrams per liter (mg/L) Total Dissolved Solids (TDS) is considered

suitable or potentially suitable as a municipal and domestic water supply. SWRCB Resolution No. 68-16, which is also incorporated into the Basin Plan, requires that the existing high quality of groundwater be maintained unless it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use, and will not result in water quality less than applicable standards.

Present and potential future beneficial uses for surface waters in the Central Coast Basin are: municipal supply (water for community, military, or individual water supplies); agricultural; groundwater recharge; recreational water contact and non-contact; sport fishing; warm fresh water habitat; wildlife habitat; rare, threatened, or endangered species; and spawning, reproduction, and/or early development of fish. Present and potential future beneficial uses for groundwater are municipal supply, agricultural supply, and industrial supply. Groundwater in the MGSA Area is currently used for industrial supply at the CEMEX Lapis Plant sand mine site. The extracted groundwater is reported to contain a concentration of approximately 19,000 mg/L TDS. In addition, groundwater containing less than 3,000 mg/L TDS has a designated potential beneficial use as a source of domestic and municipal supply as noted above.

2.2.7.4 TITLE 22 DRINKING WATER PROGRAM

The SWRCB Division of Drinking Water (DDW) regulates public water systems in the state to ensure the delivery of safe drinking water to the public. A public water system is defined as a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. Private domestic wells, wells associated with drinking water systems with less than 15 residential service connections, industrial wells, and irrigation wells are not regulated by the DDW.

DDW enforces the monitoring requirements established in CCR Title 22 for public water system wells, and all the data collected must be reported to DDW. Title 22 also designates the Maximum Contaminant Levels (MCLs) for various waterborne contaminants, including volatile organic compounds, non-volatile synthetic organic compounds, inorganic chemicals, radionuclides, disinfection byproducts, general physical constituents, and other parameters.

2.2.8 INCORPORATION OF REGULATORY PROGRAMS INTO THE GSP

Information from the management plans and monitoring programs described in this section has been incorporated into this GSP, and was considered in establishing the sustainability goal provided in Section 4.2, when setting minimum thresholds and measurable objectives (as described in Chapter 4), and during development of projects and management actions described in Chapter 6.

The existing monitoring programs and monitoring networks constitute a well-developed and broadly distributed system that provides representative data throughout the Subbasin and in the vicinity of the MGSA Area. As discussed in Chapter 5 (Monitoring Networks), the monitoring program of this GSP will incorporate the groundwater level and quality data collected by MCWRA from the nested monitoring wells installed in the vicinity of the MGSA Area under the MMRP adopted for the MPWSP. MCWRA also monitors the nested Deep Aquifer wells installed by USGS about ½-mile south of the MGSA Area, and a

number of other wells in the 180-Foot, 400-Foot, and Deep Aquifers. Water level and quality data collected from these wells will also be incorporated into the monitoring program of this GSP. MCWRA’s and SVBGSA’s regional monitoring programs will be considered in interpreting the local monitoring data, but will not be a formal component of MGSA’s more locally-focused monitoring network.

Plans are in progress by MCWRA to expand the network of nested groundwater monitoring wells in the vicinity of the MGSA Area and incorporate additional wells into this monitoring program. It is anticipated that groundwater level and quality monitoring of the Deep Aquifer will be expanded and improved in the future under programs implemented by MCWRA and MCWD GSA. Applicable program improvements and expansions of these monitoring programs in the vicinity of the MGSA Area will also be incorporated into this GSP as described in Chapter 5 (Monitoring Networks).

The incorporation of these regulatory programs during implementation of this GSP is described in Chapter 7 (Plan Implementation).

2.2.9 LIMITS TO OPERATIONAL FLEXIBILITY

This GSP has been developed to be coordinated with the requirements, management plans and monitoring programs administered by other jurisdictions in the area, including SVBGSA, MCWRA, MCWD GSA, and CCRWQCB. Some of the existing management plans and ordinances include well registration, extraction monitoring, new well restrictions, pumping allowances and restrictions, recharge requirements, and/or water quality protection standards that will limit operational flexibility. However, the limits imposed by these programs and plans have already been considered in the sustainable management criteria, monitoring networks, and projects and management actions described in Chapters 4, 5, and 6, respectively. As such, they are not expected to further limit operational flexibility under this GSP. No other limits to operational flexibility have been identified.

2.2.10 CONJUNCTIVE USE PROGRAMS

Regulation Requirements:

§354.8(e) A description of conjunctive use programs in the basin.

MCWRA is engaged in a number of conjunctive use projects to help eliminate basin overdraft and seawater intrusion. MCWD works in cooperation with MCWRA to further water supply development and resource management, and is exploring alternative water sources to augment groundwater supplies. The MPWSP will draw groundwater from the Subbasin with subsurface slant intake wells as the water source for the desalination plant. Under the terms of the June 14, 2016 Return Water Settlement Agreement (CalAm 2016), CalAm proposes to replace some of the groundwater it withdraws from the Subbasin by delivering a portion of the "return water" from its desalination treatment plant by providing a portion of the treated water from its desalination plant to Castroville Community Services District (CCSD). The program has not received final approvals or begun operating, and currently lacks any water rights. If it is ever approved, begins operation, and the "return water" program is implemented, the GSP will be revised with further information on the agreement.

2.2.10.1 MONTEREY COUNTY WATER RECYCLING PROJECTS (CSIP/SVRP)

In 1995, MCWRA began construction of the Monterey County Water Recycling Projects to deliver recycled wastewater for irrigation use in the Castroville area in order to reduce groundwater pumping (MCWRA 2019a). The CSIP produces recycled water which is used along the coast instead of pumping groundwater for agricultural irrigation. The CSIP has operated successfully since 1998, reducing groundwater pumping and the rate of seawater intrusion. The success of the CSIP led to the development and implementation of the Salinas Valley Reclamation Project (SVRP) to further address basin overdraft and seawater intrusion. A rubber dam (i.e., the SRDF) was installed on the Salinas River approximately 5 river miles upstream of the river mouth near Marina (MCWRA 2019a). The SRDF was constructed to provide seasonally stored and treated (filtered and chlorinated) river water for irrigation, significantly reducing the need to pump groundwater except in periods of extremely high demand. Recycled water from the SVRP is distributed to approximately 12,000 acres of farmland within the Subbasin via the CSIP distribution system (MCWRA 2019a). The current CSIP distribution area is shown in Figure 2-6. M1W operates a large treatment plant located in the County Environmental Park north of Marina off Del Monte Boulevard. This plant will produce 19,500 AFY of recycled water for irrigation in the Castroville area to contain seawater intrusion. The farmers in this area will be able to reduce groundwater pumping from the aquifer and thereby fight seawater intrusion. This plant will provide recycled water for some landscaped areas in Marina.

2.2.10.2 PURE WATER MONTEREY PROJECT

The PWM Project, which is completing construction and expected to begin delivering water in about October 2019, is an advanced water recycling project that will provide a safe, reliable, and sustainable drinking water supply and will reduce water taken from the Carmel River and the Seaside Subbasin (PWM 2019). The PWM Project will also provide a source of tertiary treated water for the Salinas Valley agricultural industry and provide treatment for impaired surface water. By supplying additional tertiary treated water for CSIP, PWM will reduce the reliance on groundwater pumping, thereby helping to combat the effects of seawater intrusion.

The project is expected to deliver approximately 3,500 AFY of potable water for the Monterey Peninsula and off-set approximately 2,000 AFY of groundwater pumping in the Subbasin (PWM 2019). MPWMD and M1W are also completing a supplemental Environmental Impact Report for a major expansion of the Project that could deliver up to an additional 2,250 AFY of water for Monterey Peninsula water users by fall 2021 (Johnson 2019).

2.2.10.3 MCWD REGIONAL URBAN WATER AUGMENTATION PROJECT

In February 2018, MCWD received a \$10.5M Proposition 1 low-interest loan and grant for the RUWAP, a recycled water transmission and distribution system (MCWD 2019b). MCWD and M1W partnered to build a transmission pipeline spanning 10 miles for the purified recycled water. In addition, MCWD constructed a storage reservoir (Blackhorse Recycled Water Reservoir) and distribution pipes to deliver advanced treated water to existing and planned urban irrigation facilities.

The goal of the RUWAP Recycled Water Project is to provide 1,427 AFY of water from sources other than groundwater within the District and up to 3,700 acre-feet (AF) of water to the PWM (MCWD 2019b). The pipeline will initially deliver 600 AF of advanced treated water to MCWD customers in Marina and the Ord Community (MCWD 2019b). The advanced treated water will be suitable for use in Seaside Basin and elsewhere. This water will be of higher quality than tertiary treated and disinfected recycled water, and may be used for urban landscape irrigation reducing the District's reliance on groundwater.

2.2.10.4 MCWD RECYCLED WATER PROJECT

To meet future demands, MCWD is working to maximize existing water supplies and is investing in infrastructure to deliver tertiary treated recycled water (MCWD 2019a). Recycled water is wastewater that is treated, filtered, and disinfected to SWRCB Standards. Recycled water is used to irrigate large landscaped areas (parks, golf courses, and playgrounds) and crops. MCWD currently uses about 600 AFY of recycled water for landscaping in the Marina and Seaside areas. The use of recycled water reduces the amount of groundwater that is pumped from aquifers. In the Salinas Valley, where aquifers are over pumped, reduced pumping decreases the rate of seawater intrusion. MCWD will receive recycled water from M1W (described above) for some landscaped areas in Marina. Presently in Marina, Gloria Jean Tate Park is piped for recycled water. The external landscape of some of the other commercial businesses nearby have also been piped for recycled water.

MCWD is also conducting an indirect potable reuse (IPR) feasibility study to assess using advanced treated recycled water from M1W for groundwater augmentation (EKI 2019). A groundwater-flow model is being developed as part of this study to identify a preferred project for injection of purified recycled water into the Monterey Subbasin for future extraction by MCWD's municipal production wells. The IPR is intended to both supplement MCWD's groundwater supplies, as well as to protect production wells from saline water intrusion.

2.3 GENERAL PLANS AND OTHER LAND USE PLANS

2.3.1 PLAN SUMMARIES

Regulation Requirements:

§354.8(f) A plain language description of the land use elements or topic categories of applicable general plans that include the following:

(1) A summary of general plans and other land use plans governing the basin.

The City of Marina has land use authority over the incorporated areas of the City of Marina, which includes the Coastal Zone and the MGSA Area. Marina has developed and adopted both a General Plan and a Local Coastal Land Use Plan. Land use is an important factor in water management as described below. Monterey County has land use authority over the unincorporated areas of the county and considers the general plans of all cities within the county to allow for cooperative planning. The following sections provide a general description of these land use plans and how implementation may affect groundwater and its beneficial uses in the MGSA Area and its vicinity.

2.3.1.1 CITY OF MARINA GENERAL PLAN

The City of Marina was founded in 1915 and incorporated in 1975, and the first General Plan was adopted in 1978. The overall goal of the Marina General Plan is “the creation of a community which provides a high quality of life for all its residents; which offers a broad range of housing, transportation, and recreation choices; and which conserves irreplaceable natural resources” (City of Marina 2010). One of the general framework goals of the plan is particularly relevant to this MGSP—“Community development which avoids or minimizes to the greatest extent possible the consumption or degradation of nonrenewable natural resources including natural habitats, water, energy, and prime agricultural land” [1.18.2].

The General Plan specifies open space policies to ensure retention of land with significant natural resource values [2.3.3] and include habitat reserves and other open space for the protection of important habitat and scenic areas [2.7.1]. Habitat reserve and open space include coastal strand and dune areas adjacent to Monterey Bay and wetlands, which provide habitat for rare, threatened wildlife and plant species. Some of the lands designated as “Habitat Reserve and Other Open Space” in the General Plan are as follows (Figure 2-7):

- Approximately 1,600 acres west of Highway 1 are designated as habitat reserve for this purpose [2.10.2].
- An area of 80 acres on the Armstrong Ranch property between Del Monte Boulevard and Highway 1 is designated as Habitat Reserve due to the presence of “vernal ponds” [2.10.4].

The General Plan recognizes that future water demands will require changes in the management of water resources in the area, and water conservation and water reclamation and reuse will constitute major components of future water management efforts. The policies and programs of the General Plan are designed to promote both water conservation and the use of recycled water to protect water quality and to ensure that the demand of future community development does not exceed the capacity to provide water in an environmentally acceptable way [3.42].

The General Plan includes the following measures related to water-supply planning.

- New developments must have identified water sources [3.45].
- A 15% reserve will be maintained between demand and supply. When demand exceeds 85% of the available supply, no new development will be allowed until supplemental water sources are identified [3.47].

The primary responsibility for water resource management in Marina rests with MCWD, as the water purveyor, and MCWRA, which is responsible for managing the surface water and groundwater resources of the Salinas Valley Groundwater Basin.

2.3.1.2 CITY OF MARINA LOCAL COASTAL PROGRAM

The California Coastal Act requires that local governments in the Coastal Zone create and implement Local Coastal Programs (LCPs) to conserve coastal dependent land use. City of Marina has an approved

LCP that consists of a Local Coastal Land Use Plan (LCLUP) and a Local Coastal Implementation Plan (LCIP) (City of Marina 2013a, 2013b). Under the California Coastal Act, City of Marina manages coastal development, including addressing the challenges presented by coastal hazards like storms, flooding, and erosion, and CCC has jurisdiction over such issues below the mean high tide line.

City of Marina’s Coastal Zone includes Highway 1 and all lands west of Highway 1 within the incorporated limits. In addition, the Coastal Zone includes two other areas: vacant lands west of Del Monte Boulevard between Reservation Road and the City’s southern boundary, including coastal dunes, cultivated acreage, and some substantial “vernal ponds” with associated wetlands; and a narrow strip about 2 miles long west of Highway 1 within the Ford Ord boundary, including the coastal bikeway and the Southern Pacific Railroad tracks. The MGSA Area is within the Coastal Zone.

The critical coastal planning issues in Marina focus on the future of the dunes now that sand mining will cease in December 2020; the future of the vernal ponds; and on establishing uses that would be compatible with the existing ESHA constraints present in the City’s Coastal Zone. The policies of the LCLUP as well as the land use designations address these concerns and resolve them in terms of the mandates of the California Coastal Act for the beach, dunes, and vernal ponds. Policies related to habitat management relevant to this GSP are as follows:

- **Vernal Ponds** – To protect and encourage the restoration of the vernal ponds to their original state and allow only those uses adjacent, which will reinforce and conserve the unique habitat qualities of these ponds [24].
- **Dunes** – To protect the habitat of recognized rare and threatened/endangered species found in the coastal dune area [25].

The emphasis of the LCLUP is to maximize public access consistent with the environmental sensitivity of the dune habitat and resident rare and threatened/endangered plants and animals. Coordination with PARKS was initiated to identify areas for park access. However, direct access to the dune vegetation is limited due to the level of use that the vegetation can withstand.

Because Marina is a coastal city, global warming and associated sea level rise are important areas of concern. The City addresses these issues as part of its Local Coastal Program and in connection with its issuance of coastal development permits.

Amendments were made to the City’s Open Space Zoning district, and established recreation areas were rezoned as Open Space. The addition of a reclassification section to the Open Space district will allow future areas designated for development to be subsequently rezoned as Open Space and clearly held for the future.

The City has identified that the biodiversity and unique features of coastal vernal ponds in the vicinity of the MGSA Area need to be preserved. The City of Marina LCP, certified by the Coastal Commission on April 20, 1982, guides development within the coastal zone in Marina. A request for a Comprehensive Management Plan (CMP) was initiated in 1990 by the Coastal Commission in response to development

pressures around the City’s vernal pond resources. The City of Marina engaged stakeholders in a collaborative effort to prepare the CMP. A Technical Advisory Committee, comprised of representatives from the City of Marina, MPRPD, California Department of Fish and Game (CDF&G), Coastal Commission, Coastal Conservancy, Sierra Club, and other interested residents, was also established to guide development of the plan. Four meetings were held with the Technical Advisory Committee. A public meeting was held on March 18, 1993, to present preliminary findings on the resources of the ponds and solicit comments from the public on management issues. A second public meeting was held on November 18, 1993, to present the draft plan and solicit comments on the proposed management plan recommendations. The final plan was adopted on February 15, 1994 (The Habitat Restoration Group 1994).

City of Marina is preparing an updated CMP for the coastal and/or vernal ponds that will identify guidelines for the preservation, management, and enhancement of the region’s wetland resources (City of Marina 2013a). The plan will include both public and privately owned ponds, including those owned and managed by City of Marina, PARKS, and MCWD.

2.3.1.3 MONTEREY COUNTY GENERAL PLAN

Planning in Monterey County began in 1930 when the Planning Commission was created. The Planning Department was established in the 1950s, and the first General Plan was completed in 1968 and updated in 1982. Planning efforts have resulted in growth primarily in and around existing population areas and cities; however, the main objectives are to “provide direction for growth that supports continued viability of agricultural production and preserves as much of the county’s scenic and environmental resources as possible.” The current Monterey County General Plan was completed in 2010 and the objectives remain the same (Monterey County 2010).

The Monterey County General Plan includes the following goals and policies related to land use, conservation and open space, public water supply and agriculture that are relevant to this GSP:

- Promote appropriate and orderly growth and development while protecting desirable existing land uses [GOAL LU-1].
 - Land uses shall be designated to achieve compatibility with adjacent uses [LU-1.5].
- Encourage the provision of open space lands as part of all types of development including residential, commercial, industrial, and public [GOAL LU-8].
 - Creation of private, nonprofit land trusts and conservation organizations to receive development rights on any lands to be preserved and maintained as open space shall be supported [LU-8.6].
- Conserve listed species, critical habitat, habitat and species protected in area plans; avoid, minimize and mitigate significant impacts to biological resources [GOAL OS-5].
 - Conservation of listed species shall be promoted [OS-5.1].
 - Conservation of species shall be promoted as provided in the Area Plans [OS-5.2].

- Development shall be carefully planned to provide for the conservation and maintenance of critical habitat [OS-5.3].
- Development shall avoid, minimize, and mitigate impacts to listed species and critical habitat to the extent feasible [OS-5.4].
- Efforts to obtain and preserve natural areas of particular biologic, scientific, or educational interest, and restrict incompatible uses from encroaching upon them, shall be encouraged [OS-5.13].
- The County shall prepare, adopt, and implement a program that allows projects to mitigate the loss of critical habitat [OS-5.17].
- Prior to disturbing any federal or state jurisdictional areas, all applicable federal and state permitting requirements shall be met, including all mitigation measures for development of jurisdictional areas and associated riparian habitats [OS-5.18].
- In order to preserve riparian habitat, conserve the value of streams and rivers as wildlife corridors and reduce sediment and other water quality impacts of new development, the county shall develop and adopt a Stream Setback Ordinance [OS-5.22].
- Assure an adequate and safe water supply to meet the county’s current and long-term needs [GOAL PS-2].
 - Coordination among, and consolidation with, those public water service providers drawing from a common water table to prevent overdrawing the water table [PS-2.1].
- Ensure that new development is assured a long-term sustainable water supply [GOAL PS-3].
 - Specific criteria for proof of a Long-Term Sustainable Water Supply and an Adequate Water Supply System for new development requiring a discretionary permit shall be developed by ordinance. The following factors shall be used [PS-3.2]:
 - Water quality
 - Production capacity
 - Capability of the water purveyor
 - Source of the water supply and nature of the water rights
 - Cumulative impacts of existing and projected future water demand, and the ability to reverse trends contributing to an overdraft condition
 - Effects of additional extraction or diversion of water on the environment including on in-stream flows necessary to support riparian vegetation, wetlands, fish or other aquatic life
 - Projects or best management practices to renew or sustain aquifer functions.
 - Specific criteria shall be developed by ordinance for use in the evaluation and approval of adequacy of all domestic wells [PS-3.3].
 - The County shall request an assessment of impacts on adjacent wells and instream flows for new high-capacity wells where there may be a potential to affect existing adjacent domestic or water system wells adversely or in-stream flows necessary to support riparian vegetation, wetlands, fish, and other aquatic life [PS-3.4].

- The Monterey County Health Department shall not allow construction of any new wells in known areas of saltwater intrusion. [PS-3.5].
- The County shall coordinate and collaborate with all agencies responsible for the management of existing and new water resources [PS-3.6].
- A program to eliminate overdraft of water basins shall be developed [PS-3.7].
- In order to maximize agricultural water conservation measures to improve water use efficiency and reduce overall water demand, the county shall establish an ordinance identifying conservation measures that reduce agricultural water demand [PS-3.10].
- In order to maximize urban water conservation measures to improve water use efficiency and reduce overall water demand, the county shall establish an ordinance identifying conservation measures that reduce potable water demand [PS-3.11].
- The County shall maximize the use of recycled water [PS-3.12].
- Ensure adequate treatment and disposal of wastewater [GOAL PS-4].
 - The County shall encourage groundwater recharge through the use of reclaimed wastewater, not including primary treated wastewater, in accordance with federal, state, and local laws, regulations and ordinances [PS-4.4].
- Ensure compatibility between the county’s agricultural uses and environmental resources [GOAL AG-5].
 - Policies and programs to protect and enhance surface water and groundwater resources shall be promoted but shall not be inconsistent with state and federal regulations [AG-5.2].

The Monterey County General Plan requires discretionary development to provide proof of a long-term sustainable water supply prior to approval. Discretionary development will not be able to proceed in areas wherein new water demands would exacerbate existing seawater intrusion or groundwater overdraft.

2.3.2 IMPACT OF GENERAL PLANS AND LAND USE PLANS ON WATER DEMANDS

Regulation Requirements:

§354.8(f) (2) A general description of how implementation of existing land use plans may change water demands within the basin or affect the ability of the Agency to achieve sustainable groundwater management over the planning and implementation horizon, and how the Plan addresses those potential effects.

The current designated land use of the MGSA Area is Habitat Preserve and Other Open Space. Permitted use of the CEMEX plant will cease in December 2020 and the impacted area will be reclaimed and restored by CEMEX according to its filed reclamation plan. Any new developments in this area should be consistent with the designated land use and therefore should have limited water demand.

CalAm is under court order to cease illegal diversions from the Carmel River and provide an alternative water supply, and requires additional water supplies to address long-term overdraft in the adjudicated

Seaside Subbasin. The proposed MPWSP would provide up to approximately 6,252 AFY of desalinated water to CalAm’s service area (CPUC 2018). The proposed MPWSP, if implemented, would consist of a desalination plant that receives source water from five subsurface slant wells (plus two standby wells) near the shore at the CEMEX site (ESA 2018). The slant wells would extract a combined volume of approximately 17,400 AFY (HWG 2017) of groundwater consisting of a combination of saline groundwater (some of which originated in the ocean) and low total dissolved solids (TDS) groundwater from the Dune Sand and 180-Foot Aquifers within the Subbasin. If the proposed MPWSP is fully approved and implemented, or if well extractions by others are proposed, such extractions of groundwater potentially may cause exceedances of measurable objectives established for the MGSA Area and trigger the need for management actions. The monitoring program described in Chapter 5 and the management actions described in Chapter 6 would address this occurrence.

2.3.3 IMPACT OF THE GSP ON LAND USE PLAN ASSUMPTIONS

Regulation Requirements:

§354.8(f) (3) A general description of how implementation of the Plan may affect the water supply assumptions of relevant land use plans over the planning and implementation horizon.

Implementation of this GSP is consistent with the goals and policies of the City of Marina and Monterey County General Plans, and is expected to aid in their achievement. The designated land use of the MGSA Area is Habitat Preserve and Other Open Space. Permitted use of the CEMEX plant will cease in December 2020. Any future development in this area should be consistent with this designation and should have limited water demand.

The MPWSP is proposed to provide up to approximately 6,252 AFY of desalinated water to CalAm’s service area (CPUC 2018). A recent analysis of supply options and demand forecasts indicates that a proposed expansion of the Pure Water Monterey project could provide sufficient water for the Monterey Peninsula for the next 20 years or more, even in the absence of the MPWSP (Stoldt 2019). Current planning data do not extend to the SGMA planning horizon of 50 years; however, this analysis indicates that sufficient long-term water supplies should be available as supply strategies are developed to meet future demands through the SGMA planning and implementation horizon. Demand and supply forecasts will be updated as new information becomes available.

The General Plans for other cities within the Subbasin and for Monterey County provide guidelines to facilitate anticipated growth within the sustainable capacity of existing water resources. Successful land use planning also promotes sustainable water supply, supply development, and use within the Central Coast region. The goals and policies in the General Plans complement this GSP and support the ability of the GSA to achieve sustainability. Implementation of this GSP, including changes in groundwater management, may result in changes in water supplies; however, current projects are anticipated to be able to meet forecast water demands within the General Plan planning horizons.

2.3.4 PERMITTING NEW OR REPLACEMENT WELLS

Regulation Requirements:

§354.8(f) (4) A summary of the process for permitting new or replacement wells in the basin, including adopted standards in local well ordinances, zoning codes, and policies contained in adopted land use plans.

The Monterey County Health Department, Drinking Water Protection Services (DWPS) well program is responsible for the well permitting process for all domestic, irrigation, agricultural, cathodic protection, monitoring, or heat exchange wells (Monterey County 2019). Under California Water Code (CWC) § 7.70.030, a written permit is required from the Monterey County Health Officer for any new or replacement wells installed under this GSP. In addition, a coastal development permit is required for any well proposed to be drilled in the Coastal Zone. The MGSA Area is located entirely within the California Coastal Zone.

Under CWC § 7.70.060, construction, repair, and destruction of all wells requires the use of a licensed contractor with a current C57 license from the State of California. Similarly, other parties proposing to abandon a well within the MGSA Area will be required to obtain such a permit. The fundamental State Well Standard is augmented in the Salinas Valley by Specifications for Wells in Zone 6 of the Monterey County Flood Control and Water Conservation District, which were adopted by County Health Department in 1988 to protect groundwater quality and prevent corrosion of well casing caused by seawater intrusion in the coastal (Zone 6) portion of the basin (MCWRA 2006). MCWRA collaborates with Monterey County Health Department during the application and review process for permitting new water supply wells.

Wells must meet a 2.5-acre minimum lot size requirement for on-site sewage disposal. If sewage disposal is or will be by an onsite waste disposal system and the lot can be served by a water system, the property must be at least 2.5 acres in order to obtain a permit to construct. Prior to placement of a well seal, the driller must submit a seal proposal to Monterey County Environmental Health Bureau (EHB) for review and approval (see Section 2.4.2).

In the future, SGMA allows that GSAs be consulted to verify that groundwater extraction from new proposed wells is consistent with adopted GSPs prior to issuing well construction permits. MGSA will respond to any requests to comment on applications to construct new wells within its jurisdiction.

2.3.5 LAND USE PLANS OUTSIDE THE MGSA AREA

Regulation Requirements:

§354.8(f) (5) To the extent known, the Agency may include information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management.

Applicable land use plans outside the Subbasin include the General Plan for the City of Marina and the County General Plan. This GSP has considered and is aligned with the goals and implementation strategies for these general plans as well as other applicable land use plans, such as the local coastal plan. These land use plans are in alignment with the concerns and plans of the MGSA and should not affect the ability of the MGSA to achieve sustainable groundwater management within the MGSA Area.

Several amendments to the County General Plan, which were approved by the Board of Supervisors in February 2013 (Resolution No. 13-028) require Monterey County to develop a study of a portion of the Salinas Valley Groundwater Basin’s water supplies that includes, among other items:

- An assessment of whether the total water demand for all uses designated in the General Plan for 2030 are likely to be reached or exceeded;
- An evaluation and conclusions regarding future expected trends in groundwater elevations; and
- An evaluation and conclusions regarding expected future trends in seawater intrusion.

Should the study conclude that total water demand for all uses is likely to be exceeded by 2030, groundwater elevations are likely to decline by 2030, or the seawater intrusion front is likely to advance inland by 2030, then the study shall make recommendations on how to address those conditions. The settlement agreement furthermore required the development of the Salinas Valley Integrated Hydrologic Model (SVIHM), a pre-released version of which was used for the SVBGSA GSP and which will be used to facilitate implementation and updating of this GSP. Implementation of this GSP is consistent with the above requirements and objectives, and is expected to aid in their achievement.

The City of Marina General Plan contemplates growth and water demand increase at levels that were incorporated into the City’s UWMP, discussed in Section 2.2.6.3. The projected increase in the City’s water demand is within the groundwater pumping allocations for the Central Marina service system and Armstrong Ranch under the 1993 and 1996 Annexation Agreements (Schaaf & Wheeler 2016). This groundwater extraction will occur from resources within the adjacent Monterey Subbasin. MGSA will coordinate its monitoring program and any necessary management actions MCWD GSA.

2.4 ADDITIONAL GSP COMPONENTS

Regulation Requirements:

§354.8(g) A description of any of the additional Plan elements included in the Water Code Section 10727.4 that the Agency determines to be appropriate.

The Additional GSP Components section of this MGSP provides discussion of additional GSP elements included in CWC § 10727.4 that MGSA has determined are appropriate for this GSP.

2.4.1 SEAWATER INTRUSION

The 180/400 Foot Aquifer Subbasin (Subbasin) is subject to seawater intrusion due largely to long-term groundwater extraction in the inland portions of the Subbasin in excess of the sustainable yield. As a result, it has been identified by DWR as being in a critical condition of overdraft (DWR 2016a). Seawater intrusion was first identified in the MGSA Area in the 1940s, and over the following decades progressed inland for a distance of over 7 miles in some areas. The purpose of this GSP is to support regional efforts to address this undesirable result and return to Subbasin to sustainable groundwater management within 20 years, as required by the Sustainable Groundwater Management Act (SGMA). MGSA will achieve this by supporting the projects and management actions that will be implemented by Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) under its regional Groundwater Sustainability

Plan (GSP), and by assuring that local groundwater resources are managed sustainably to protect local and regional beneficial uses and users.

Seawater intrusion in the Subbasin and in the MGSA Area is described in Section 3.2.3. Section 4.6 addresses seawater intrusion as a sustainability indicator and identifies minimum thresholds, measurable objectives, and interim milestones. Actions to monitor for and identify seawater intrusion early are described in Chapter 5. Proposed projects to control seawater intrusion are described in Chapter 6.

2.4.2 WELLHEAD PROTECTION

Water supply wells and monitoring wells in Monterey County must be constructed in accordance with California Well Standards Bulletin No. 74-81 and No. 74-90 (DWR 1981, 1991), and Monterey County Code Chapter 15.08. Pursuant to Chapter 15.04.120 of the Monterey County Code, the annular well seal is required to:

- Restore, as far as feasible, the controlling hydrological conditions that existed before the well was drilled and constructed, including the elimination of physical hazards.
- Prevent pollution of groundwater and conserve the yield and hydrostatic head of aquifers.
- Prevent intermingling of desirable and undesirable waters.

For any well installed as part of this GSP, the driller must submit the seal proposal to Monterey County EHB for approval and EHB will witness placement of the seal (Monterey County 2019).

The designated land use of the MGSA Area is Habitat Preserve and Other Open Space, so the Wellhead Protection requirements from California Department of Pesticide Regulation (CDPR 2019) will not apply.

2.4.3 MIGRATION OF CONTAMINATED GROUNDWATER

The MMRP adopted for the proposed MPWSP requires that project to incorporate groundwater level and quality monitoring data for the Fort Ord Superfund site Operable Unit Carbon Tetrachloride Plume (OUCTP) in the A-Aquifer and 180-Foot Aquifer into its monitoring program to assure that the proposed groundwater extraction from the project slant intake wells will result in the further migration of that plume (CPUC 2018). These plumes are located approximately 7,000 feet southeast of the MGSA Area. Monterey County established well prohibition/consultation zones at Fort Ord, in areas where groundwater extraction may be impacted by contaminated plumes (Ordinance No. 04011, Monterey County 1999). No other known contamination exists within or near the MGSA Area.

2.4.4 WELL ABANDONMENT/WELL DESTRUCTION PROGRAM

To protect groundwater quality, the Monterey County Health Department DWPS well program is responsible for permitting the abandonment and/or destruction of domestic, irrigation, agricultural, cathodic protection, monitoring, or heat exchange wells. The well program works closely with Monterey County Planning, the cities, MCWRA, and MPWMD. If any wells will be abandoned or destroyed as part

of this GSP, MGSA will obtain a permit and use a contractor with a current C57 license from the State of California, as required by the County (Monterey County 2019). Similarly, other parties proposing to abandon a well within the MGSA Area will be required to obtain such a permit.

2.4.5 REPLENISHMENT OF GROUNDWATER EXTRACTIONS

Replenishment of groundwater extractions is not contemplated under this GSP.

2.4.6 CONJUNCTIVE USE

Existing conjunctive use projects are identified in Section 2.2.10. Chapter 6 describes several conjunctive use projects that are being implemented or proposed by other parties, with which the MGSA will cooperate. This chapter describes the proposed projects and management actions that will address implementing, opportunities for, and removing impediments to conjunctive use or underground storage projects in the Subbasin near the MGSA Area.

2.4.7 WELL CONSTRUCTION POLICIES

Regulatory oversight over sustainable groundwater management expanded when SB 252 was signed into law on October 7, 2017. New proposed wells located in the Subbasin, designated by DWR as a critically overdrafted basin, are subject to the requirements of SB 252. The well applicants must provide the following information as part of the well application:

- A map of the location, including global positioning system (GPS) coordinates and elevation
- Proposed capacity, estimated pumping rate, anticipated pumping schedule, and estimated annual extraction volume
- Geologic siting information (water table depth, seasonal fluctuations, recharge area, recharge rate, location to floodplain)
- Distance from ponds, lakes, and streams within 300 feet
- Estimated cumulative extraction volume before January 1, 2020
- Size of area (acres) to be served by the well

SB 252 is only a temporary measure, meant to expire when GSPs for critically overdrafted basins are submitted to DWR by January 31, 2020. It is expected that further coordination of well permitting procedures with the adopted GSPs will occur after that time.

On May 22, 2018, the Monterey County Board of Supervisors adopted Interim Emergency Ordinance No. 5302 pursuant to Government Code § 65858, which temporarily prohibits new wells in seawater-intruded aquifers pending the County's study and consideration of regulations. The ordinance imposed a moratorium on County Health Department accepting and processing new well permits; it is not a moratorium on additional groundwater pumping from existing wells. The ordinance prohibits the acceptance or processing of any permit applications for new wells in the defined Area of Impact within the Subbasin until May 21, 2020, with exceptions for municipal wells and replacement wells.

2.4.8 GROUNDWATER PROJECTS

Groundwater projects and management actions, including measures to address seawater intrusion, groundwater recharge, in-lieu use, diversions to storage, conservation, water recycling, conveyance, and/or extraction projects, are described in Chapter 6.

2.4.9 EFFICIENT WATER MANAGEMENT PRACTICES

Ongoing efforts to implement efficient water management practices, as defined in CWC § 10902, for the delivery of water and water conservation methods to improve the efficiency of water use will be consistent with MCWD UWMP, and are described in Section 2.2.6.3.

2.4.10 RELATIONSHIPS WITH STATE AND FEDERAL AGENCIES

A strong relationship between MGSA and federal and state agencies is vital to the success of this GSP. Efforts to develop this relationship are described in Chapter 7 (Plan Implementation).

2.4.11 LAND USE PLANNING

Efforts will be made at the local level to develop a formal opportunity for coordination with other GSAs and planning entities to provide input on the land use and water-related elements of future General Plans and California Environmental Quality Act (CEQA) documentation to promote consistency with this GSP.

2.4.12 GROUNDWATER-DEPENDENT ECOSYSTEMS

The GSP Regulations include specific requirements to identify and consider Groundwater-Dependent Ecosystems (GDEs) (23 CCR § 354.16(g)) when determining whether groundwater conditions are having potential effects on beneficial uses and users. GSAs must also assess whether sustainable management criteria may cause adverse impacts to beneficial uses, which include environmental uses, such as plants and wildlife. As discussed further in Section 3.2.7, there are no GDEs directly within the MGSA Area, but an analysis following guidelines developed by The Nature Conservancy for identification of GDEs (TNC, 2018) identified several likely GDEs in the area east of the MGSA Area. Similar GDEs occur north and south of the MGSA Area. These GDEs have been identified as coastal or vernal ponds, and consist of palustrine and emergent wetlands. They are ESHAs under the Marina LCP and are designated protected areas within the Coastal Zone of California under the California Coastal Act. Groundwater development within the MGSA Area could affect these GDEs. The biodiversity and unique features of coastal vernal ponds in the vicinity of the MGSA Area are protected under the 1994 City of Marina CMP (The Habitat Restoration Group 1994).

2.5 NOTICE AND COMMUNICATION

Regulation Requirements:

§ 354.10. Notice and Communication

Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:

- (a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.
- (b) A list of public meetings at which the Plan was discussed or considered by the Agency.
- (c) Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.
- (d) A communication section of the Plan that includes the following:
 - (1) An explanation of the Agency’s decision-making process.
 - (2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.
 - (3) A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.
 - (4) The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

MGSA and City of Marina have developed and followed an open and inclusive process to implement SGMA. Interested parties have opportunities, both formal and informal, to provide input to MGSA throughout the process of developing, operating, and implementing this GSP. Such opportunities include, but are not limited to, public comment periods required by SGMA (CWC § 10728.4), as well as opportunities for public comment during regular and special City Council meetings, and at other times to be determined and noticed pursuant to CWC § 10727.8(a).

Public Meetings/Public Comment Opportunities

- March 20, 2018, General City Council Meeting:
 - Public hearing regarding the City’s intent to become a GSA
 - Floor open for public comments concerning adoption of Resolution
 - Resolution 2018-25 adopted (vote unanimous)
- August 7, 2019, General City Council Meeting:
 - Presentation and public meeting/workshop to discuss preparation of a locally focused GSP for a portion of the Subbasin
 - Floor open for public comments concerning preparation of a GSP
- October 8, 2019, Special City Council Meeting:
 - Presentation and public meeting/workshop to filing of a Notice of Intent to adopt a GSP for the MGSA Area of the 180/400 Foot Subbasin
 - Floor open for public comments concerning filing of the Notice of Intent and public review of the draft GSP
- October 11, 2018 – November 25, 2019, 45-Day Public Comment Period
 - Public comment period for interested parties to provide written comments on the public review draft GSP via mail or email
 - Hard copies available at City of Marina City Hall and the Marina Branch Library

- Responses to comments received during the public comment period are provided in Volume II of this MGSA GSP
- October 29, 2019, Special City Council Meeting:
 - Presentation and public meeting/workshop to discuss the public review draft of the GSP for the MGSA Area of the 180/400 Foot Subbasin
 - Floor open for public comments concerning the public review draft GSP
- January 7, 2020, Special City Council Meeting:
 - Public meeting/hearing to discuss adoption of the GSP for MGSA Area of the 180/400 Foot Subbasin
 - Floor open for public comments concerning the GSP and its adoption
- January 14, 2020, General City Council Meeting:
 - Public meeting/hearing to discuss adoption of the GSP for MGSA Area of the 180/400 Foot Subbasin
 - Floor open for public comments concerning the GSP and its adoption
 - Vote to adopt the GSP

Opportunities for public comments on the MGSA GSP and its implementation will be provided at future General City Council Meetings, which are generally held every second Tuesday. Special presentations may be made regarding implementation status, specific findings, management actions, and other activities related to GSP implementation.

2.5.1 DESCRIPTION OF BENEFICIAL USES AND USERS

Regulation Requirements:

§354.10 Each plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:

- (a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.

SGMA (CWC §§ 10720, *et seq.*) requires that GSAs consider the interests of all beneficial uses and users of groundwater. To meet this requirement (specifically CWC § 10723.4), City of Marina identified the following interested parties and environmental stakeholders:

1. Local water districts adjoining the MGSA Area
 - a. MCWD
 - b. Monterey One Water and MCWRA for the Castroville Seawater Intrusion Project
2. Holders of overlying groundwater rights (agricultural and domestic well owners, municipal well operators and public water systems)
 - a. Armstrong Ranch
 - b. CEMEX
3. Surface-water users
 - a. Monterey One Water and MCWRA for the Castroville Seawater Intrusion Project

4. Environmental users of groundwater
 - a. Fort Ord Dunes State Park
 - b. Marina Beach State Park
 - c. Salinas River National Wildlife Refuge
 - d. City of Marina
 - e. County of Monterey
5. Local land use planning agencies
 - a. City of Marina
 - b. County of Monterey
6. Federal government
 - a. No federal lands are within the MGSA Area
 - b. Salinas River National Wildlife Refuge
7. California Native American tribes
 - a. No Native American tribes are within or near the MGSA Area
8. DACs
 - a. Portions of the City of Marina
9. Entities listed in CWC § 10927 that are monitoring and reporting groundwater elevations or quality data near the MGSA Area
 - a. MCWRA
 - b. SVBGSA
10. Other Entities
 - a. MCWD GSA
 - b. California American Water Company

The list of interested parties will continue to be updated throughout the MGSA’s development and implementation of this GSP. MGSA will engage environmental and include environmental representation throughout development and implementation of this GSP. During development of this GSP, MGSA specifically requested review and input regarding identification, characterization, and management of GDEs located near the MGSA Area. Ongoing engagement during GSP implementation could include input from state and federal resource agencies, nonprofit organizations, and other environmental interests. By engaging these stakeholders, MGSA will benefit from access to additional data and resources, resulting in a more robust and inclusive GSP. As required by SGMA (CWC §§ 10720, *et seq.*), MGSA will consider all beneficial uses of groundwater and the interest of users and managers.

2.5.2 DECISION-MAKING PROCESS

Regulation Requirements:

§354.10 (d) A communication section of the Plan that includes the following:
An explanation of the Agency’s decision-making process.

City Council of the City of Marina administers MGSA and is responsible to consider and approve policy decisions for the development, adoption, and implementation of this GSP. MGSA board meetings are held concurrently with City Council meetings on the first and third Tuesdays of each month in

accordance with the Marina Municipal Code (Chapter 2.04) and City Ordinances: 2001-11 § 1 (2001), 78-12 § 1 (1978), and 75-2 § 1 (1975). The meetings are publicly noticed and agendas are made available on the City’s website (<https://www.cityofmarina.org/AgendaCenter>).

Open meetings may be preceded by a closed session if necessary and appropriate. As described in Section 1.5.2, resolutions presented to the City Council are voted on and require a majority vote of a quorum to be passed and adopted. Open public hearings on specific resolutions may be held during meetings to allow for testimony from the public. City Council Members will consider public testimony prior to voting on specific resolutions.

2.5.3 PUBLIC ENGAGEMENT/PUBLIC OUTREACH PLAN

Regulation Requirements:

§354.10 (d)(2) Identification of opportunities for public engagement and a discussion of how public input and response will be used.

Federal, state, and local agencies, water providers, property owners, environmental stakeholders, and other interested parties will have opportunities, both formal and informal, to provide input to MGSA throughout the process of developing, operating, and implementing the MGSA GSP. Such opportunities include, but are not limited to, public comment periods required by SGMA (e.g., CWC § 10728.4) as well as opportunities for public comment during regular and special Marina City Council meetings, and at other times to be determined and noticed pursuant to CWC § 10727.8 (a).

The above-referenced agencies, water providers, and other interested stakeholders will be contacted to determine how best to consider and protect their interests and will be invited to participate in evaluating and defining roles and responsibilities during the GSP planning and implementation process.

The MGSA webpage is maintained on a regular basis at <https://cityofmarina.org/918/Groundwater-Sustainability-Plan>. The webpage includes a brief history of the formation of MGSA, a description of the MGSP groundwater area, and plans for the future. Contact information for the MGSA Plan Manager is provided, as well as background information and related documents. MGSA will post information and updates regarding GSP preparation and the Draft MGSA GSP on this webpage.

2.5.4 ENCOURAGING ACTIVE INVOLVEMENT

Regulation Requirements:

§354.10 (d)

- (3)** A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of population within the basin.
- (4)** The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.

The City of Marina is a diverse, working-class community that is focused on development, sustainability, and recreation. MGSA and City Council will work together to encourage the active involvement of diverse social, cultural, and economic elements of the community by keeping the community informed about progress implementing projects and management actions under this GSP.

Before any project or management action is implemented under this GSP, it will go through a public notice process to ensure that all groundwater users and other stakeholders have an opportunity to comment prior to adoption and implementation. The general steps in the public notice process will include the following:

- The MGSA GSP Plan Manager will bring an assessment of the need for the project to the Marina City Council in a publicly noticed meeting. This assessment will include:
 - a description of the undesirable result(s) that may occur if action is not taken;
 - a description of the proposed project or management action;
 - an estimated cost and schedule for the proposed project or management action; and
 - any alternatives to the proposed project or management action.
- Marina City Council will notify stakeholders in the area of the proposed project or management action, and allow at least 30 days for public response.
- After the 30-day public response period, Marina City Council will vote whether or not to approve design and construction of the project, or the implementation of the management action.

In addition to the public noticing detailed above, all projects will follow any environmental review and public notice provisions required by the California Environmental Quality Act (CEQA). Management actions are presumed to be exempt from CEQA since they are regulatory actions intended to protect the environment.

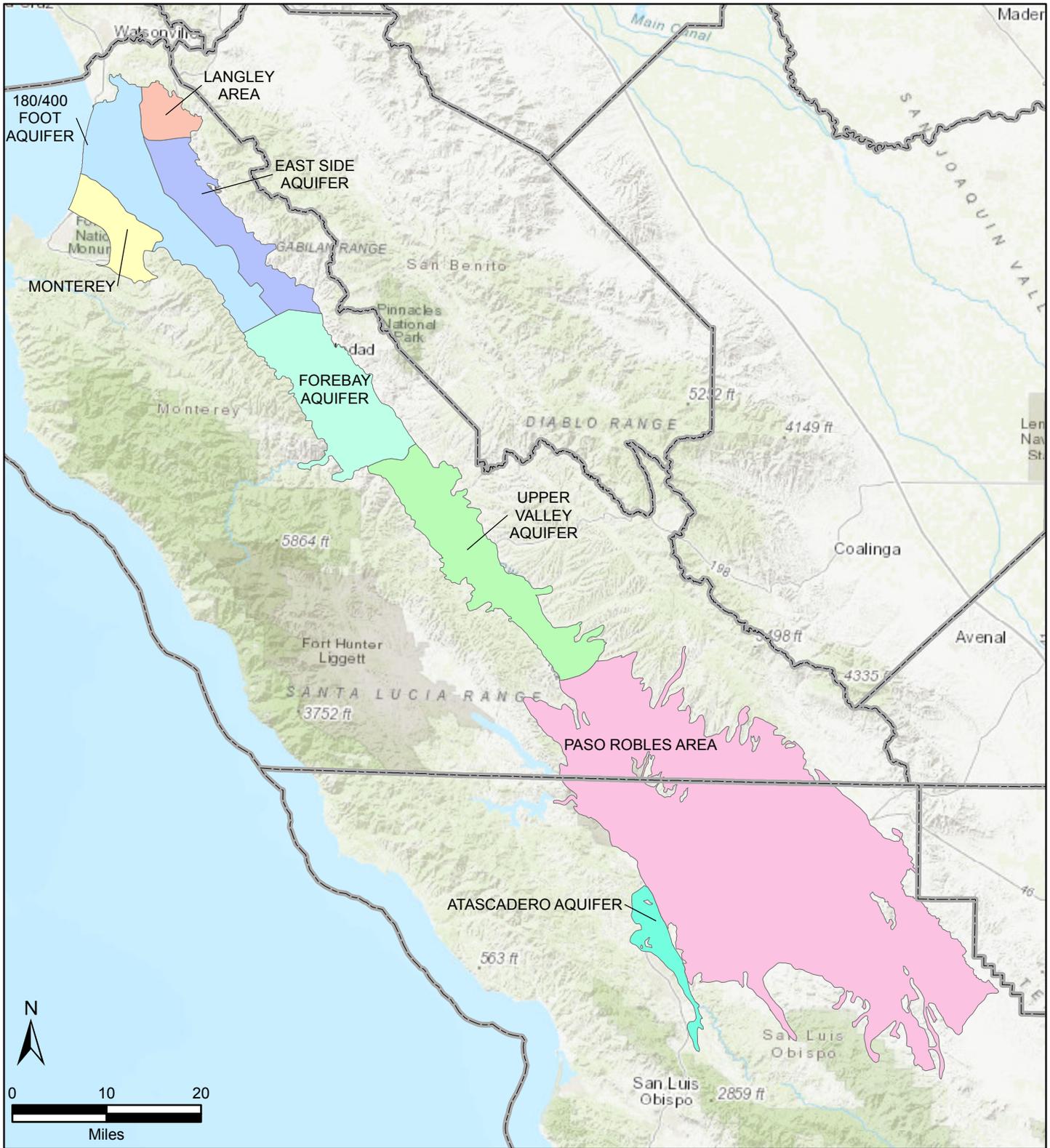


FIGURE 2-1

Salinas Valley Basin and Subbasins

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- | | | |
|------------------------------|-------------------|----------------------|
| Groundwater Subbasins | East Side Aquifer | Monterey |
| 180/400 Foot Aquifer | Forebay Aquifer | Paso Robles Area |
| Atascadero Area | Langley Area | Upper Valley Aquifer |

Counties

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa-montereyco.opendata.arcgis.com>



DATE: DEC. 30, 2019

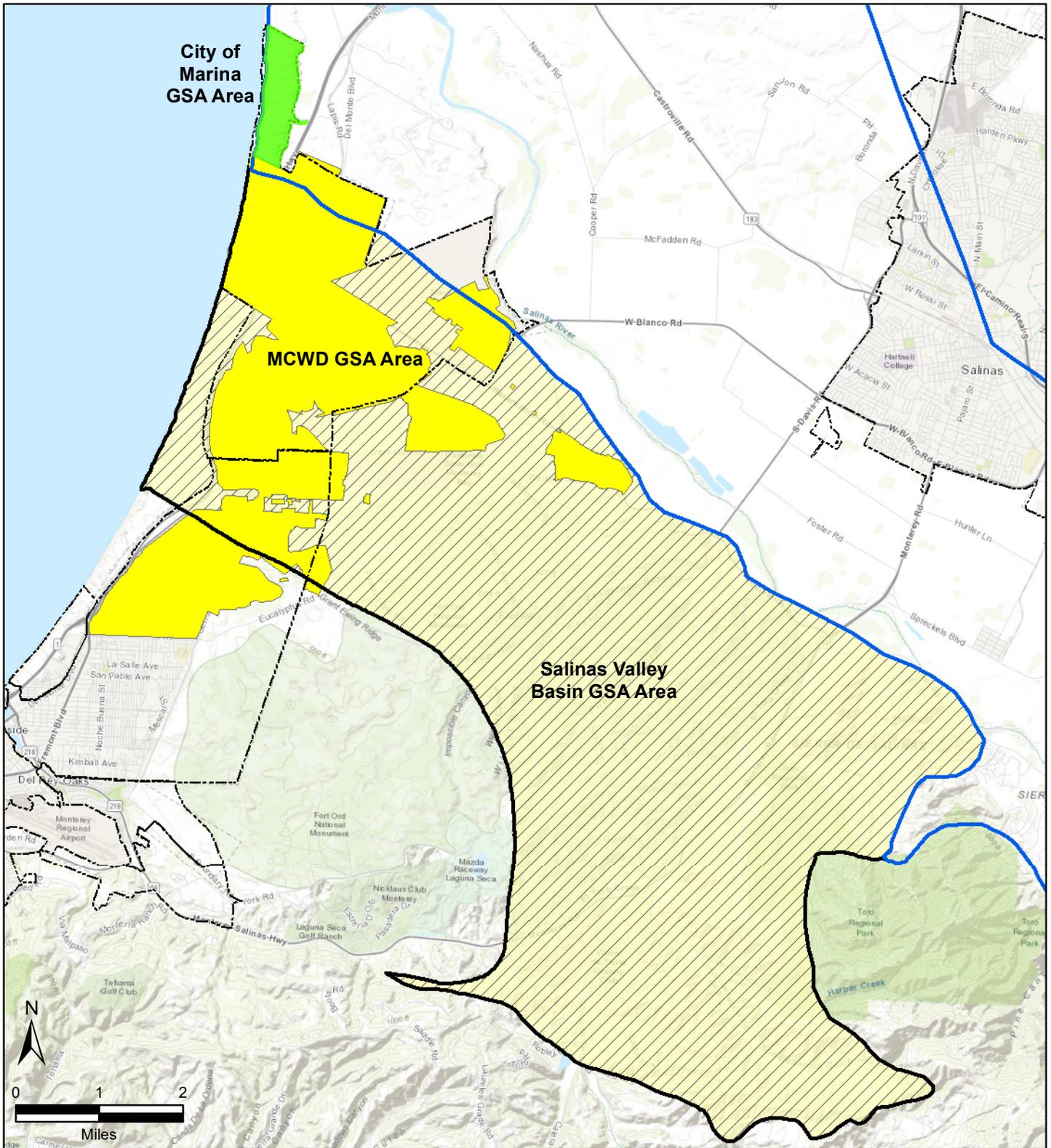


FIGURE 2-2

Monterey Subbasin GSA Areas

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- City of Marina GSA
- Marina Coast Water District (MCWD) GSA Areas
- Salinas Valley Basin (SVB) GSA Area
- Salinas Valley 180/400 Foot Aquifer Subbasin
- Cities
- Monterey Subbasin Area

Sources: ESRI Map Service Imagery, <https://sgma.water.ca.gov/portal/gsa>, <https://montereycountyopendata-12017-01-13t232948815z-montereyco.opendata.arcgis.com>

DATE: DEC. 31, 2019



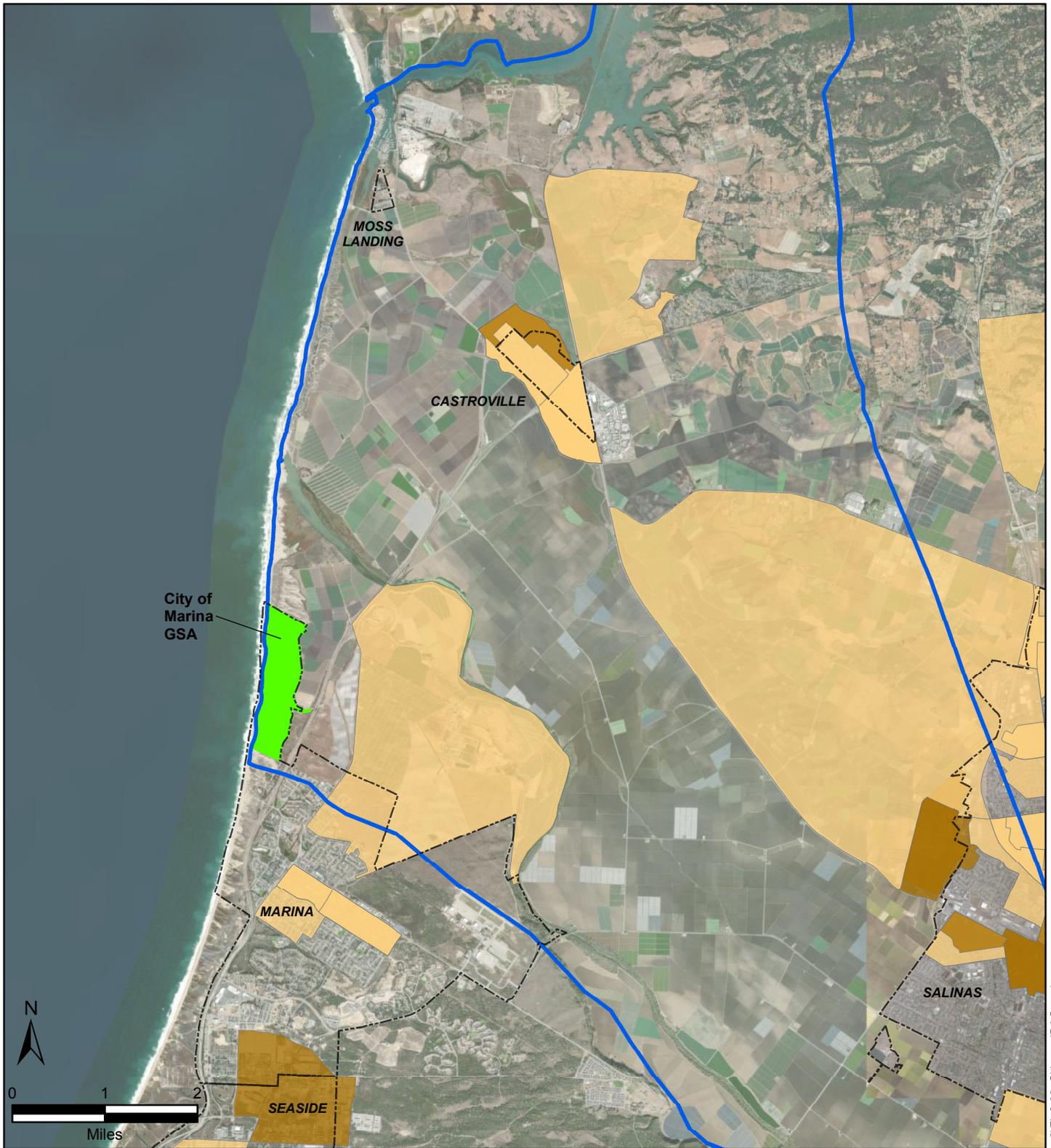


FIGURE 2-3

City Boundaries and Disadvantaged Communities (DACs)

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

Disadvantaged Communities 2016 Census

-  Severely Disadvantaged Communities (SDACs) (MHI < 38,270)
-  Disadvantaged Communities (DACs) (MHI \$38,270 - \$51,026)

-  City of Marina GSA Area
-  Cities
-  180/400 Foot Aquifer Subbasin

Sources: ESRI Map Service Imagery,
<https://gis.water.ca.gov/app/dacs/>
https://atlas-dwr.opendata.arcgis.com/datasets/6c8eedc1562e4d8b9d5232e23460d0bf_0
https://atlas-dwr.opendata.arcgis.com/datasets/4924738d96794286bf1c95db941d54fe_0
https://atlas-dwr.opendata.arcgis.com/datasets/4091ba7f52764aca868eb525ffadd69_0



DATE: DEC. 30, 2019

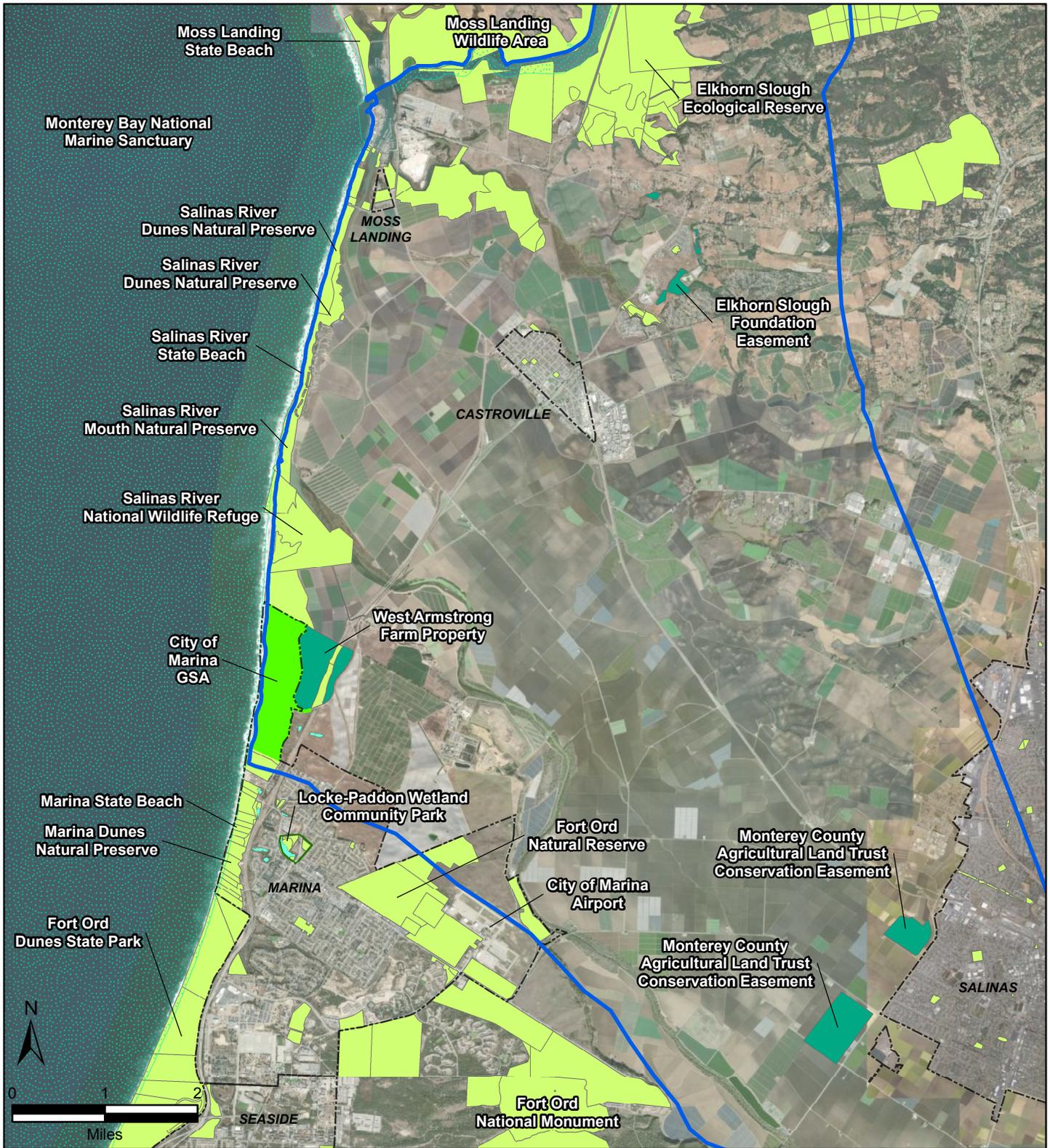


FIGURE 2-4

Federal, State and Local Managed Lands and Protected Areas

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- California Conservation Easements
- Protected Areas
- Vernal Ponds
- City of Marina GSA Area
- Cities
- 180/400 Foot Aquifer Subbasin
- Monterey Bay National Marine Sanctuary

Sources: ESRI Map Service Imagery, California Department of Water Resources, <https://www.calands.org>



DATE: DEC. 30, 2019

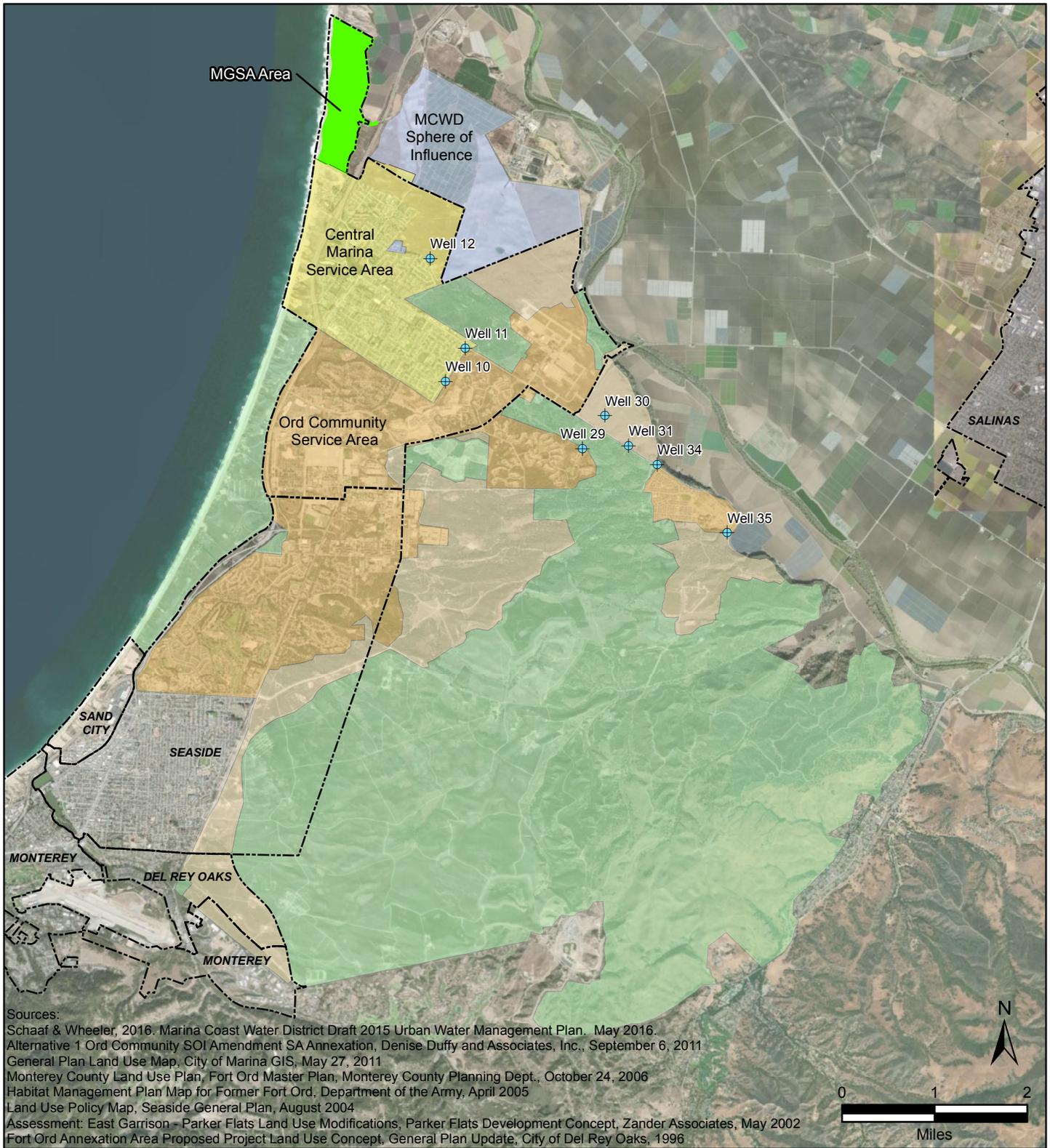


FIGURE 2-5

Water Agency Jurisdiction Areas

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

-  Water Supply Wells
-  City of Marina GSA Area
-  Cities
-  Habitat/Open Space/Parkland
-  MCWD Service Area - Central Marina
-  MCWD Service Area - Ord Community
-  MCWD Sphere of Influence
-  Ord Development Parcels



DATE: DEC, 30, 2019



FIGURE 2-6

Communities Dependent on Groundwater and the CSIP Distribution Area

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- City of Marina GSA Area
- Communities Dependent on Groundwater
- 180/400 Foot Aquifer Subbasin
- Castroville Seawater Intrusion Project (CSIP) Distribution Area

Sources: ESRI Map Service Imagery,
 California Department of Water Resources,
<https://montereycountyopendata-12017-01-13t232948815z-montereyco.opendata.arcgis.com>

DATE: DEC. 30, 2019



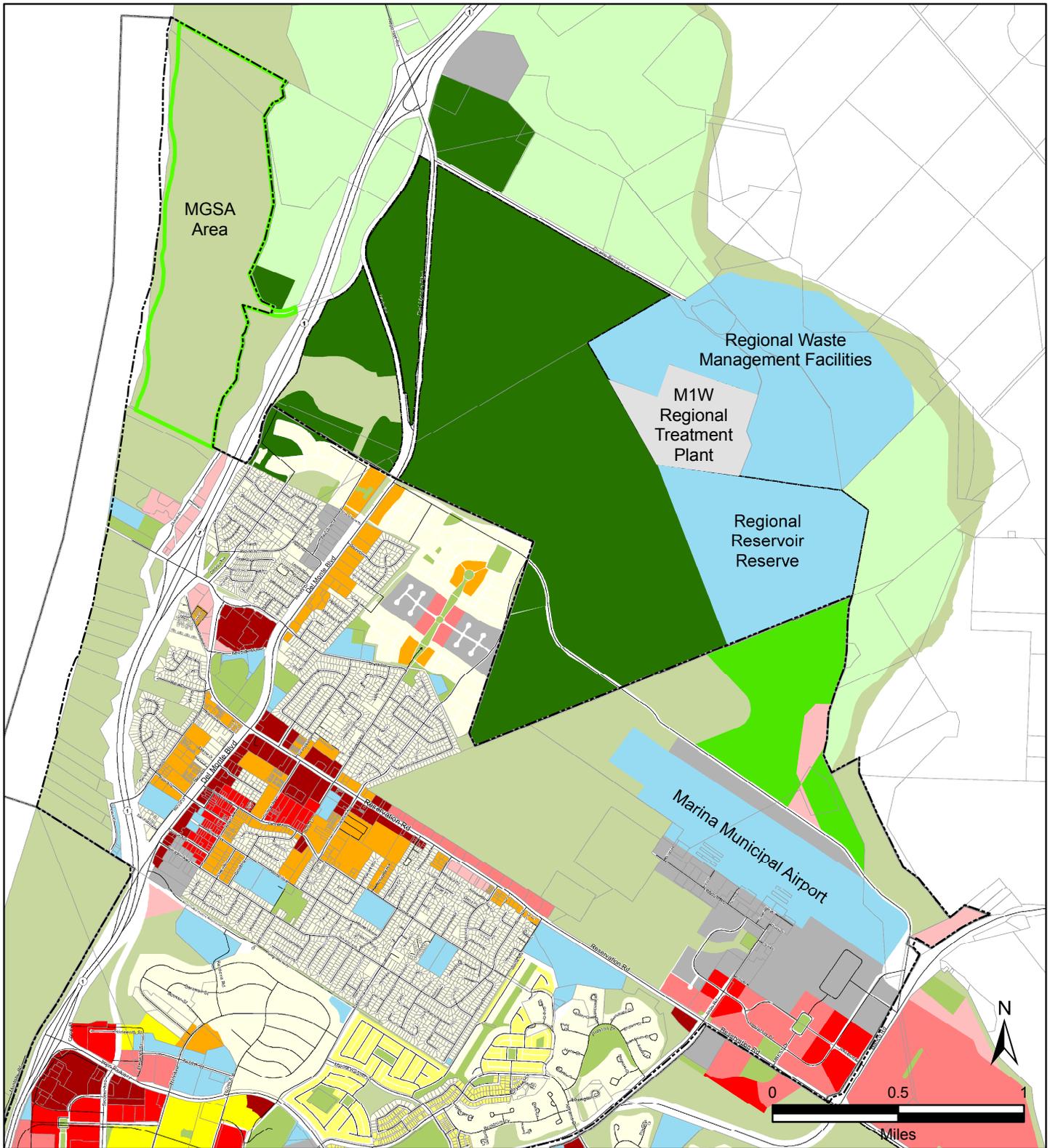


FIGURE 2-7

Land Use in the Vicinity of the MGSA Area

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

 City of Marina GSA Area	 Light Industrial/Service Commercial	 Public Facilities
 Multiple Use	 Agriculture	 Single Family Residential
 Retail/Service	 Parks & Recreation	 Marina Heights Residential
 Office/Research	 Habitat Preserve & Other Open Space	 University Villages Residential
 Visitor-Serving	 Golf Course	 Multi-Family Residential
	 UGB Open Space	 High Density Residential

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa>,
<https://montereycountyopendata-12017-01-131232948815z-montereyco.opendata.arcgis.com>
 M:\Marina\GIS\SourceFiles\CADWR_LandUse
 City of Marina GIS
 County of Monterey GIS

DATE: DEC. 30, 2019



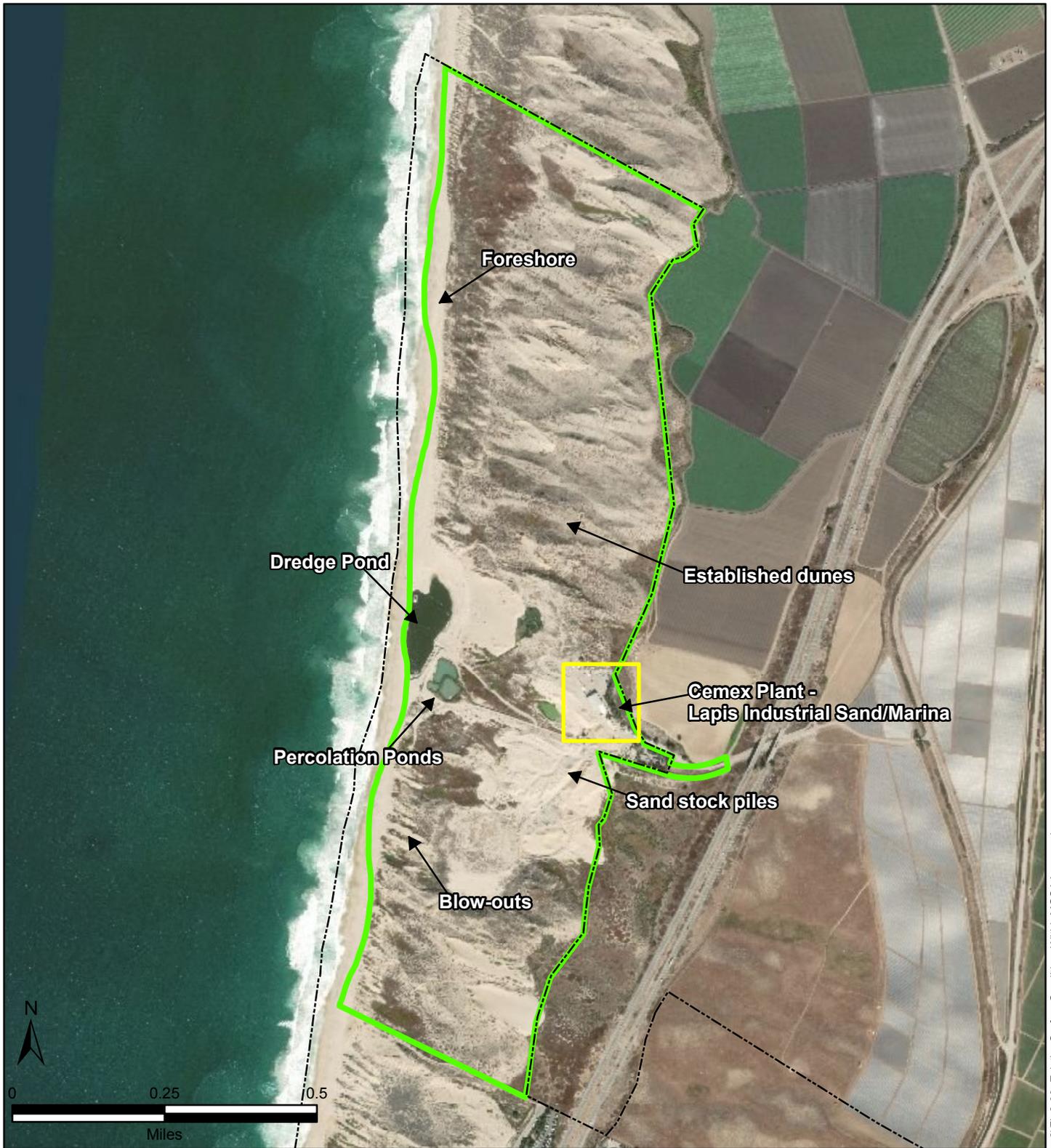


FIGURE 2-8

Existing Surface Conditions Within MGSA Area

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- City of Marina GSA Area
- City of Marina

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa>
montereyco.opendata.arcgis.com



DATE: DEC. 30, 2019

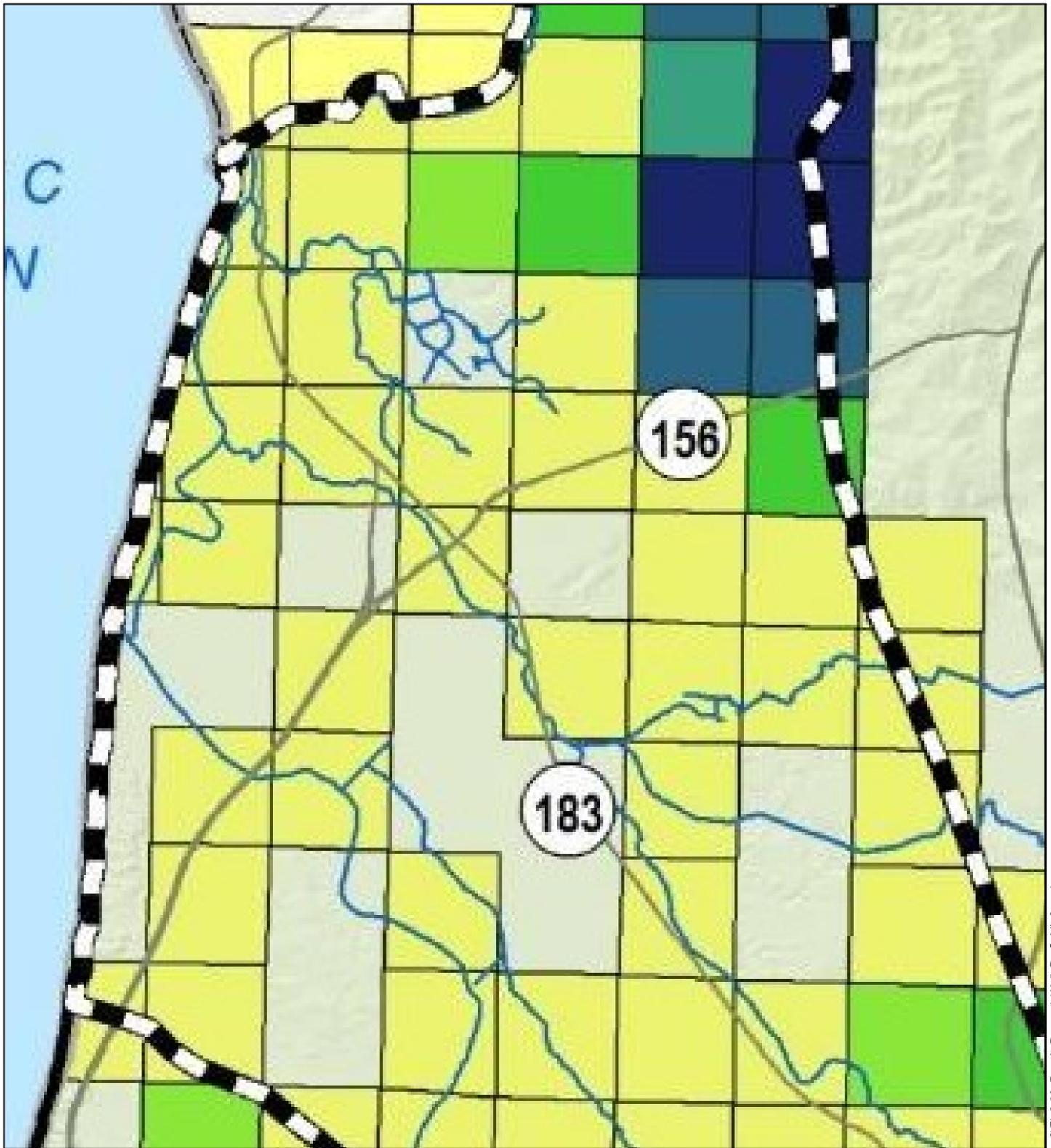


FIGURE 2-9

Density of Domestic Wells per Square Mile

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- Domestic Well Density
- 1 - 5
 - 6 - 10
 - 11 - 15
 - 16 - 20
 - 21 - 40
 - >40
 - 180/400-Foot Aquifer Subbasin

Source Report: Salinas Valley:
 180/400-Foot Aquifer Subbasin
 Groundwater Sustainability Plan
 November, 2018
 Figure 3-7



DATE: DEC. 30, 2019

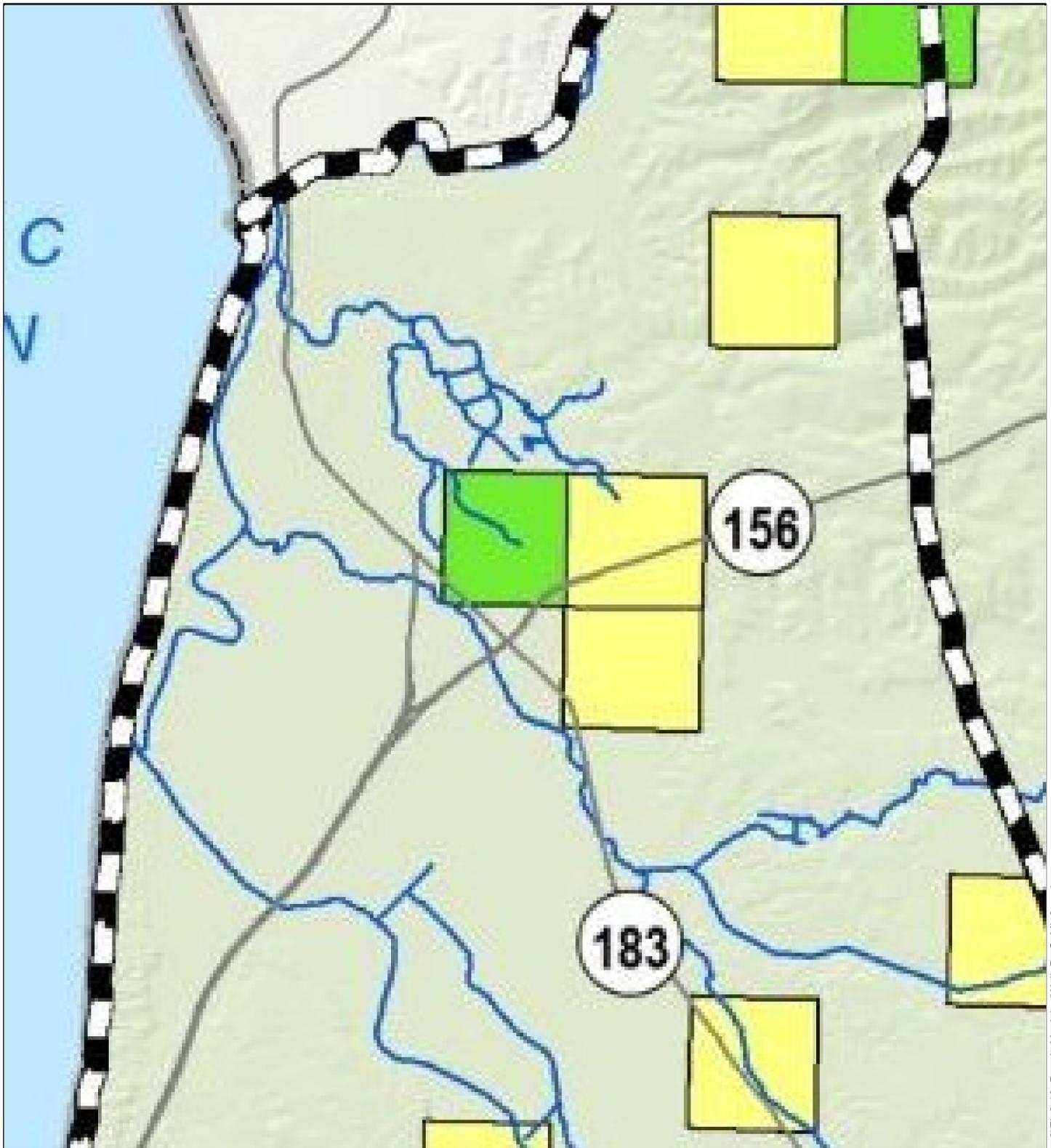


FIGURE 2-10

Density of Municipal Wells per Square Mile

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

Municipal Well Density

- | | |
|---|---|
|  1 |  3 |
|  2 |  4 |
|  >4 | |

 180/400-Foot Aquifer Subbasin

Source Report: Salinas Valley:
180/400-Foot Aquifer Subbasin
Groundwater Sustainability Plan
November, 2018
Figure 3-9



DATE: DEC. 30, 2019

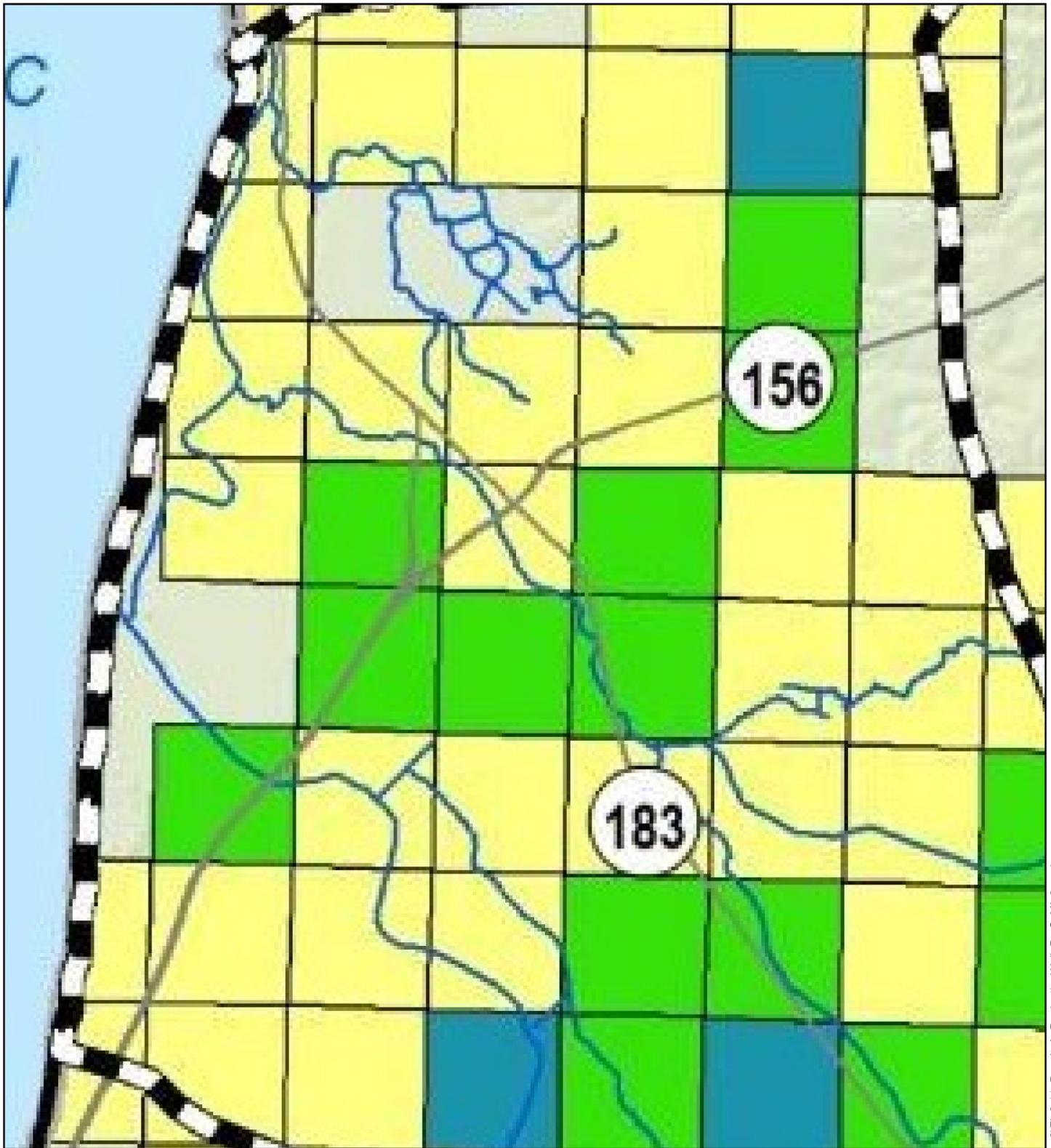


FIGURE 2-11

Density of Agricultural Production Wells per Square Mile

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

Agricultural (Production) Well Density

- 1 - 5
- 6 - 10
- 11 - 15
- >15

180/400-Foot Aquifer Subbasin

Source Report: Salinas Valley:
180/400-Foot Aquifer Subbasin
Groundwater Sustainability Plan
November, 2018
Figure 3-8



DATE: DEC. 30, 2019

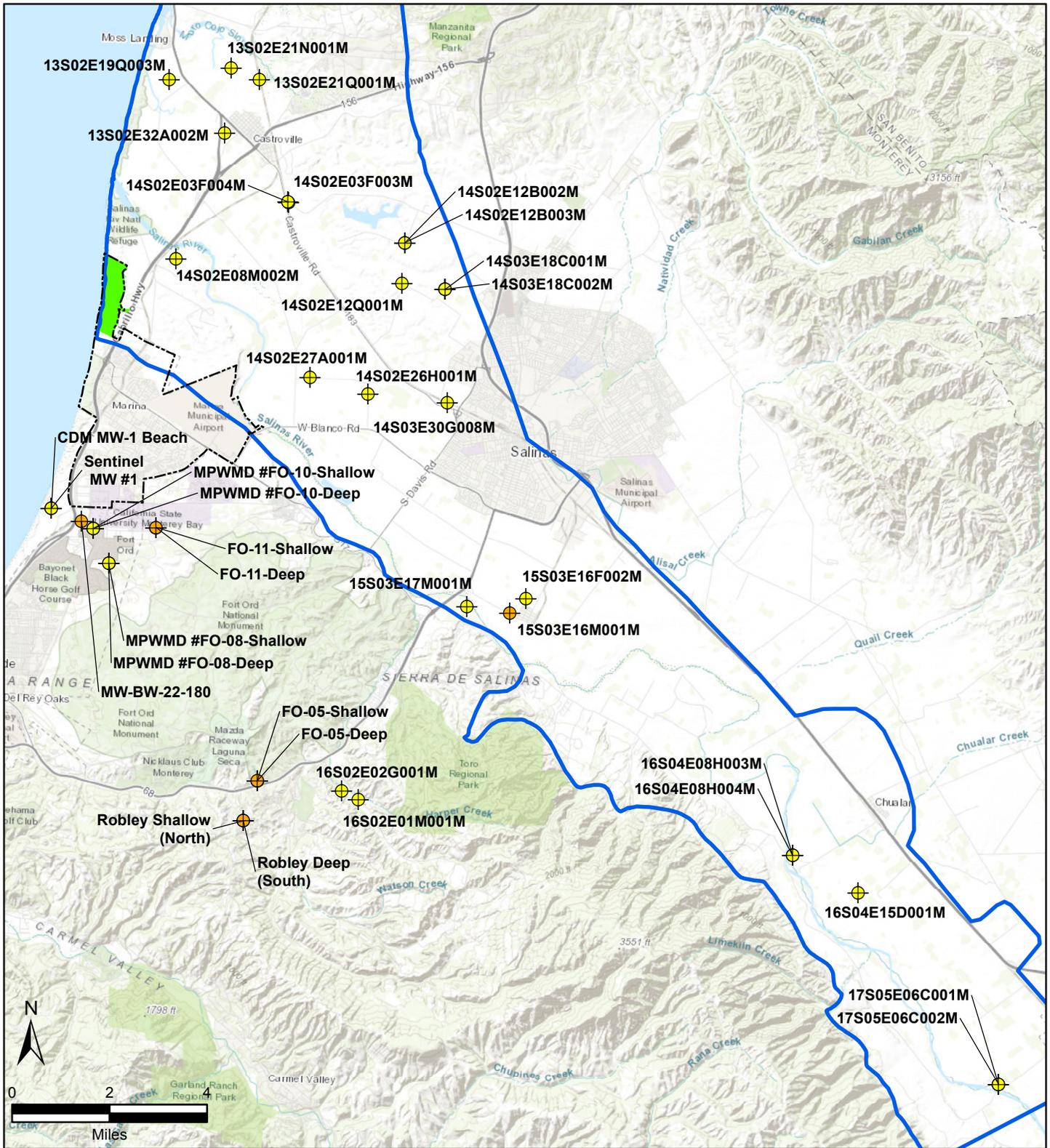


FIGURE 2-12

Locations of CASGEM Wells

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

Well Type

-  CASGEM Well
-  Participating Well

-  City of Marina GSA Area
-  City of Marina
-  180/400 Foot Aquifer Subbasin

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa>,
<https://www.casgem.water.ca.gov/OSS>



DATE: DEC. 30, 2019



FIGURE 2-13

Locations of MPWSP Wells

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

-  MPWSP Wells
-  City of Marina GSA Area
-  City of Marina
-  180/400 Foot Aquifer Subbasin

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa>,
 MPWSP Monitoring Report #160 2019



DATE: DEC. 30, 2019

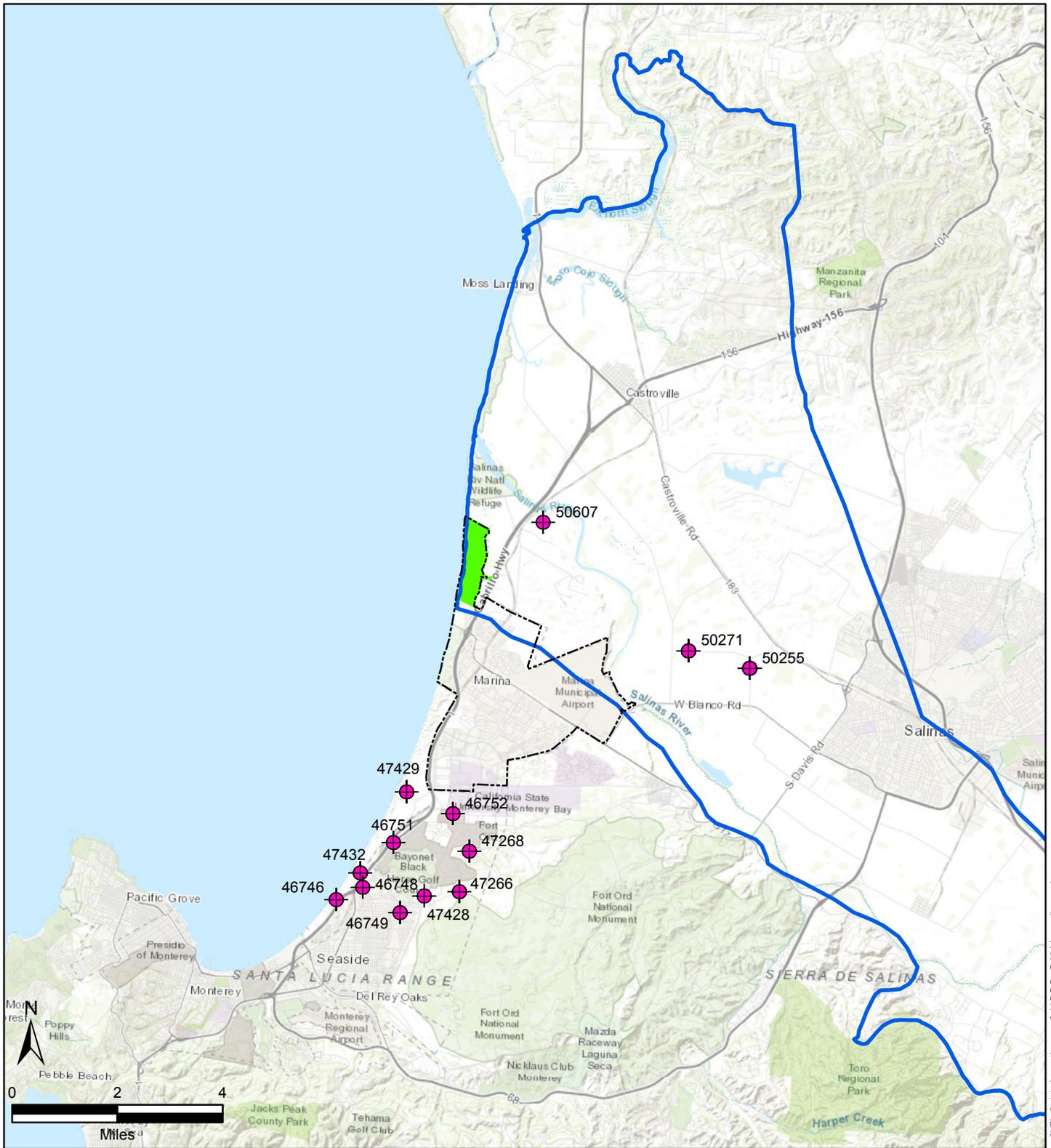


FIGURE 2-14

Locations of USGS GAMA Wells

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

-  USGS GAMA Wells
-  City of Marina GSA Area
-  City of Marina
-  180/400 Foot Aquifer Subbasin

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa>,
<https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/Default.asp>



DATE: DEC. 30, 2019

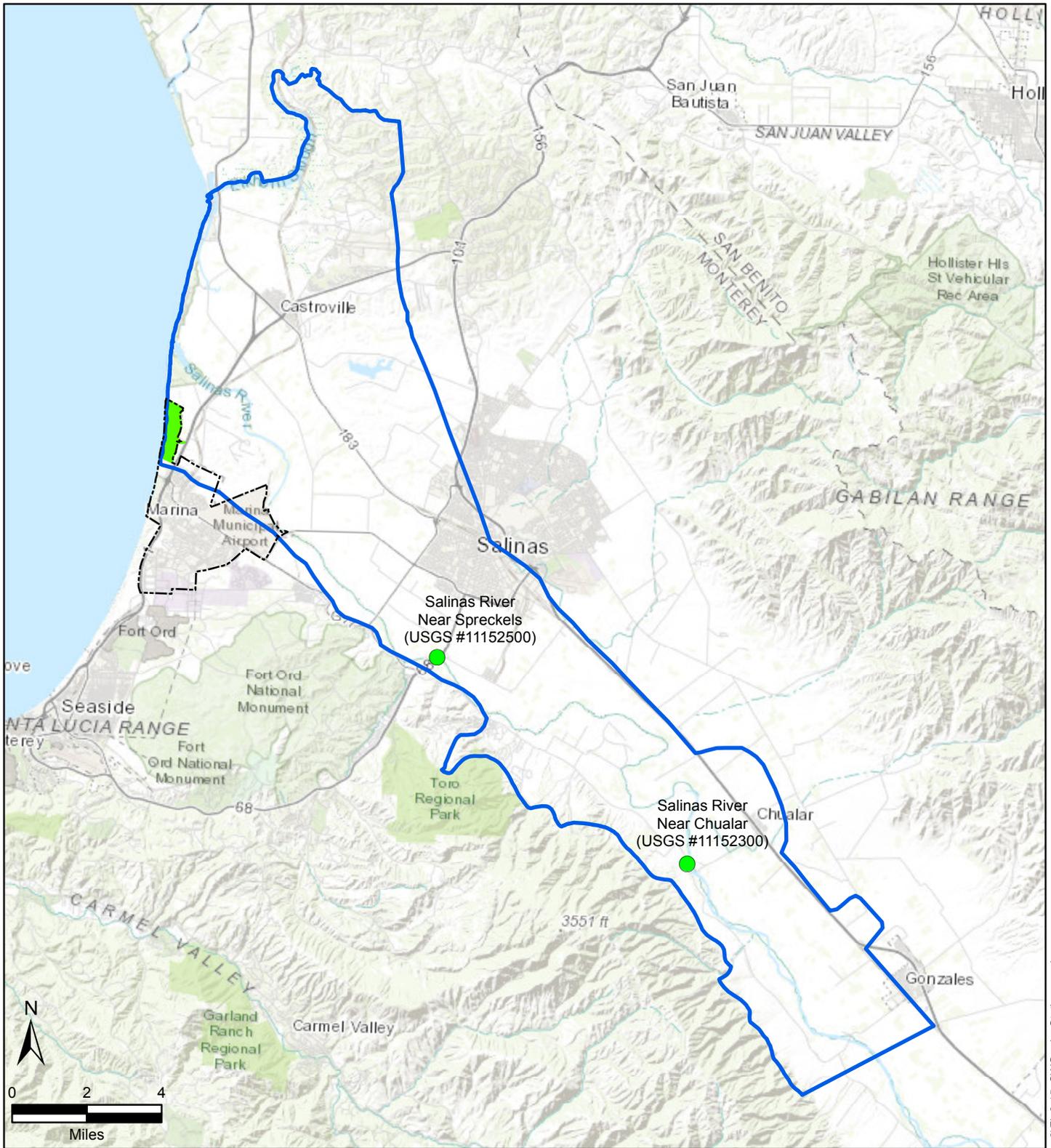


FIGURE 2-15

Surface Water Gaging Locations

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- USGS Stream Gage
- City of Marina GSA Area
- City of Marina
- 180/400 Foot Aquifer Subbasin

Sources: ESRI Map Service Imagery,
<https://sgma.water.ca.gov/portal/gsa>,
<https://waterdata.usgs.gov/ca/nwis>



DATE: DEC. 30, 2019

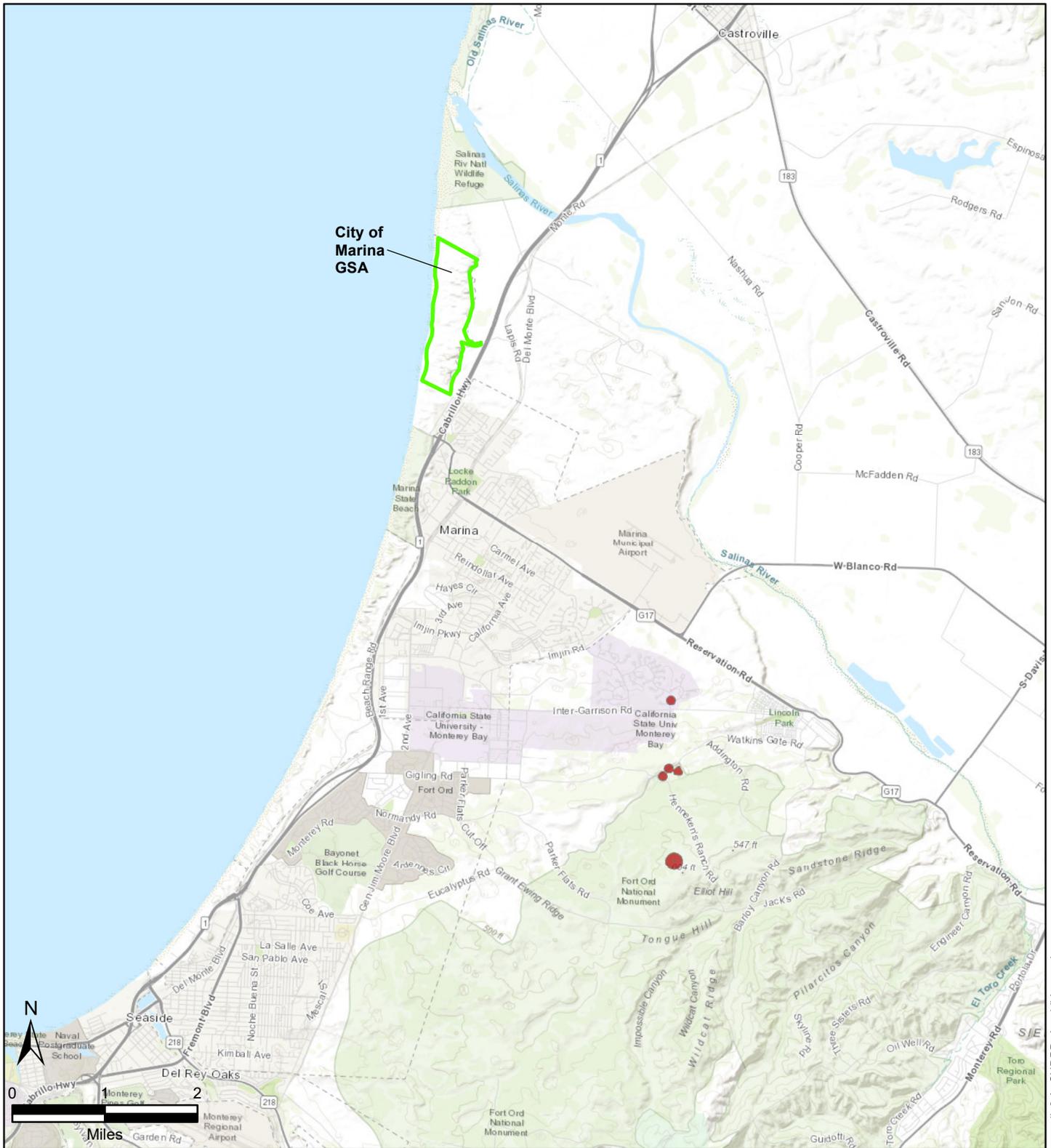
APPENDIX 2.A – CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDDB) QUERY RESULTS

This appendix provides the total occurrences of CNDDDB species within a 3-mile radius of the Marina GSP area from 1994 to 2019.

Scientific Name	Common Name	Total Occurrences	Federal Status	State Status	Rare Plant Rank	Other Status	Habitats	General Habitat	Micro-Habitat
AMPHIBIANS									
<i>Ambystoma californiense</i>	California tiger salamander	1205	Threatened	Threatened		CDFW_WL-Watch List IUCN_VU-Vulnerable	Cismontane woodland Meadow & seep Riparian woodland Valley & foothill grassland Vernal pool Wetland	Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma counties DPS federally listed as endangered.	Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.
BIRDS									
<i>Agelaius tricolor</i>	tricolored blackbird	955	None	Threatened		BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	Freshwater marsh Marsh & swamp Swamp Wetland	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.
<i>Athene cucularia</i>	burrowing owl	1988	None	None		BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	Coastal prairie Coastal scrub Great Basin grassland Great Basin scrub Mojavean desert scrub Sonoran desert scrub Valley & foothill grassland	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
<i>Buteo regalis</i>	ferruginous hawk	107	None	None		CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	Great Basin grassland Great Basin scrub Pinon & juniper woodlands Valley & foothill grassland	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats	Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	138	Threatened	None		CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	Great Basin standing waters Sand shore Wetland	Sandy beaches, salt pond levees & shores of large alkali lakes	Needs sandy, gravelly or friable soils for nesting.
<i>Eremophila alpestris actia</i>	California horned lark	94	None	None		CDFW_WL-Watch List IUCN_LC-Least Concern	Marine intertidal & splash zone communities Meadow & seep	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills.	Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.
<i>Riparia riparia</i>	bank swallow	298	None	Threatened		BLM_S-Sensitive IUCN_LC-Least Concern	Riparian scrub Riparian woodland	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.
PLANTS									
<i>Piperia yadonii</i>	Yadon's rein orchid	26	Endangered	None	1B.1		Chaparral Closed-cone coniferous forest Coastal bluff scrub	Closed-cone coniferous forest, chaparral, coastal bluff scrub	On sandstone and sandy soil, but poorly drained and often dry. 10-505 m.
<i>Arctostaphylos hookeri ssp. hookeri</i>	Hooker's manzanita	24	None	None	1B.2	BLM_S-Sensitive	Chaparral Cismontane woodland Closed-cone coniferous forest Coastal scrub	Chaparral, coastal scrub, closed-cone coniferous forest, cismontane woodland	Sandy soils, sandy shales, sandstone outcrops. 30-550 m.
<i>Arctostaphylos montereyensis</i>	Toro manzanita	18	None	None	1B.2	BLM_S-Sensitive SB_SBBG-Santa Barbara Botanic Garden	Chaparral Cismontane woodland Coastal scrub	Chaparral, cismontane woodland, coastal scrub	Sandy soil, usually with chaparral associates. 45-765 m.
<i>Arctostaphylos pajaroensis</i>	Pajaro manzanita	28	None	None	1B.1	BLM_S-Sensitive	Chaparral	Chaparral	Sandy soils. 30-170 m.
<i>Arctostaphylos pumila</i>	sandmat manzanita	17	None	None	1B.2	BLM_S-Sensitive SB_SBBG-Santa Barbara Botanic Garden	Chaparral Cismontane woodland Closed-cone coniferous forest Coastal dunes Coastal scrub	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal dunes, coastal scrub	On sandy soil with other chaparral associates. 3-210 m.
<i>Castilleja ambigua var. insalutata</i>	pink Johnny-nip	13	None	None	1B.1		Coastal bluff scrub Coastal prairie	Coastal bluff scrub, coastal prairie	Wet or moist coastal strand or scrub habitats. 3-135 m.
<i>Chorizanthe minutiflora</i>	Fort Ord spineflower	5	None	None	1B.2	SB_SBBG-Santa Barbara Botanic Garden	Chaparral Coastal scrub	Coastal scrub, chaparral (maritime)	Sandy, openings. 60-145 m.
<i>Chorizanthe pungens var. pungens</i>	Monterey spineflower	51	Threatened	None	1B.2	SB_SBBG-Santa Barbara Botanic Garden SB_UCBBG-UC Berkeley Botanical Garden	Chaparral Cismontane woodland Coastal dunes Coastal scrub Valley & foothill grassland	Coastal dunes, chaparral, cismontane woodland, coastal scrub, valley and foothill grassland	Sandy soils in coastal dunes or more inland within chaparral or other habitats. 3-270 m.
<i>Cordylanthus rigidus ssp. littoralis</i>	seaside bird's-beak	40	None	Endangered	1B.1	BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	Chaparral Cismontane woodland Closed-cone coniferous forest Coastal dunes Coastal scrub	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, coastal dunes	Sandy, often disturbed sites, usually within chaparral or coastal scrub. 30-520 m.
<i>Ericameria fasciculata</i>	Eastwood's goldenbush	23	None	None	1B.1	BLM_S-Sensitive	Chaparral Closed-cone coniferous forest Coastal dunes Coastal scrub	Closed-cone coniferous forest, chaparral (maritime), coastal scrub, coastal dunes	In sandy openings. 30-215 m.
<i>Erysimum ammophilum</i>	sand-loving wallflower	58	None	None	1B.2	BLM_S-Sensitive SB_CRES-San Diego Zoo CRES Native Gene Seed Bank SB_SBBG-Santa Barbara Botanic Garden	Chaparral Coastal dunes Coastal scrub	Chaparral (maritime), coastal dunes, coastal scrub	Sandy openings. 3-320 m.
<i>Erysimum menziesii</i>	Menzies' wallflower	19	Endangered	Endangered	1B.1	SB_RSABG-Rancho Santa Ana Botanic Garden SB_UCBBG-UC Berkeley Botanical Garden	Coastal dunes	Coastal dunes	Localized on dunes and coastal strand. 1-25 m.

Scientific Name	Common Name	Total Occurrences	Federal Status	State Status	Rare Plant Rank	Other Status	Habitats	General Habitat	Micro-Habitat
<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>	Monterey gilia	29	Endangered	Threatened	1B.2	SB_RSABG-Rancho Santa Ana Botanic Garden	Chaparral Cismontane woodland Coastal dunes Coastal scrub	Coastal dunes, coastal scrub, chaparral (maritime), cismontane woodland	Sandy openings in bare, wind-sheltered areas. Often near dune summit or in the hind dunes; two records from Pleistocene inland dunes. 5-245 m.
<i>Horkelia cuneata</i> var. <i>sericea</i>	Kellogg's horkelia	58	None	None	1B.1	SB_UCSC-UC Santa Cruz USFS_S-Sensitive	Chaparral Closed-cone coniferous forest Coastal dunes Coastal scrub	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral	Old dunes, coastal sandhills; openings. Sandy or gravelly soils. 5-430 m.
<i>Horkelia marinensis</i>	Point Reyes horkelia	36	None	None	1B.2		Coastal dunes Coastal prairie Coastal scrub	Coastal dunes, coastal prairie, coastal scrub	Sandy flats and dunes near coast; in grassland or scrub plant communities. 2-775 m.
<i>Monardella sinuata</i> ssp. <i>nigrescens</i>	northern curly-leaved monardella	25	None	None	1B.2	SB_SBBG-Santa Barbara Botanic Garden	Chaparral Coastal dunes Coastal scrub Lower montane coniferous forest	Coastal dunes, coastal scrub, chaparral, lower montane coniferous forest.	Sandy soils. 10-245 m.
<i>Trifolium buckwestiorum</i>	Santa Cruz clover	58	None	None	1B.1	BLM_S-Sensitive SB_SBBG-Santa Barbara Botanic Garden SB_UCSC-UC Santa Cruz SB_USDA-US Dept of Agriculture	Broadleaved upland forest Cismontane woodland Coastal prairie	Coastal prairie, broadleaved upland forest, cismontane woodland	Moist grassland. Gravelly margins. 30-805 m.
FISHES									
<i>Eucyclogobius newberryi</i>	tidewater goby	127	Endangered	None		AFS_EN-Endangered CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	Aquatic Klamath/North coast flowing waters Sacramento/San Joaquin flowing waters South coast flowing waters	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.
INSECTS									
<i>Bombus occidentalis</i>	western bumble bee	282	None	Candidate Endangered		USFS_S-Sensitive XERCES_IM-Imperiled		Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease	
<i>Euphilotes enoptes smithi</i>	Smith's blue butterfly	68	Endangered	None		XERCES_CI-Critically Imperiled	Coastal dunes Coastal scrub	Most commonly associated with coastal dunes & coastal sage scrub plant communities in Monterey & Santa Cruz counties	Hostplant: <i>Eriogonum latifolium</i> and <i>Eriogonum parvifolium</i> are utilized as both larval and adult foodplants.
REPTILES									
<i>Anniella pulchra</i>	northern California legless lizard	375	None	None		CDFW_SSC-Species of Special Concern USFS_S-Sensitive	Chaparral Coastal dunes Coastal scrub	Sandy or loose loamy soils under sparse vegetation	Soil moisture is essential. They prefer soils with a high moisture content.
<i>Emys marmorata</i>	western pond turtle	1375	None	None		BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	Aquatic Artificial flowing waters Klamath/North coast flowing waters Klamath/North coast standing waters Marsh & swamp Sacramento/San Joaquin flowing waters Sacramento/San Joaquin standing waters South coast flowing waters South coast standing waters Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
<i>Phrynosoma blainvillii</i>	coast horned lizard	781	None	None		BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	Chaparral Cismontane woodland Coastal bluff scrub Coastal scrub Desert wash Pinon & juniper woodlands Riparian scrub Riparian woodland Valley & foothill grassland	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes	Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.

Scientific Name	Common Name	Total Occurrences	Federal Status	State Status	Rare Plant Rank	Other Status	Habitats	General Habitat	Micro-Habitat
MAMMALS									
Reithrodontomys megalotis distichlis	Salinas harvest mouse	7	None	None			Marsh & swamp Wetland	Known only from the Monterey Bay region	Occurs in fresh and brackish water wetlands and probably in the adjacent uplands around the mouth of the Salinas River.
Sorex ornatus salarius	Monterey shrew	6	None	None		CDFW_SSC-Species of Special Concern		Riparian, wetland & upland areas in the vicinity of the Salinas River delta	Prefers moist microhabitats. feeds on insects & other invertebrates found under logs, rocks & litter.
Taxidea taxus	American badger	591	None	None		CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	Alkali marsh Alkali playa Alpine Alpine dwarf scrub Bog & fen Brackish marsh Broadleaved upland forest Chaparral Chenopod scrub Cismontane woodland Closed-cone coniferous forest Coastal bluff scrub Coastal dunes Coastal prairie Coastal scrub Desert dunes Desert wash Freshwater marsh Great Basin grassland Great Basin scrub Interior dunes Ione formation Joshua tree woodland Limestone Lower montane coniferous forest Marsh & swamp Meadow & seep Mojavean desert scrub Montane dwarf scrub North coast coniferous forest Oldgrowth Pavement plain Redwood Riparian forest Riparian scrub Riparian woodland Salt marsh Sonoran desert scrub Sonoran thorn woodland Ultramafic Upper montane coniferous forest Upper Sonoran scrub Valley & foothill grassland	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.
HABITAT TYPE									
Central Dune Scrub	Central Dune Scrub	24	None	None			Coastal dunes		
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	53	None	None			Marsh & swamp Wetland		
Central Maritime Chaparral	Central Maritime Chaparral	19	None	None			Chaparral		



APPENDIX 2.A-1

CNDDDB Amphibian Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

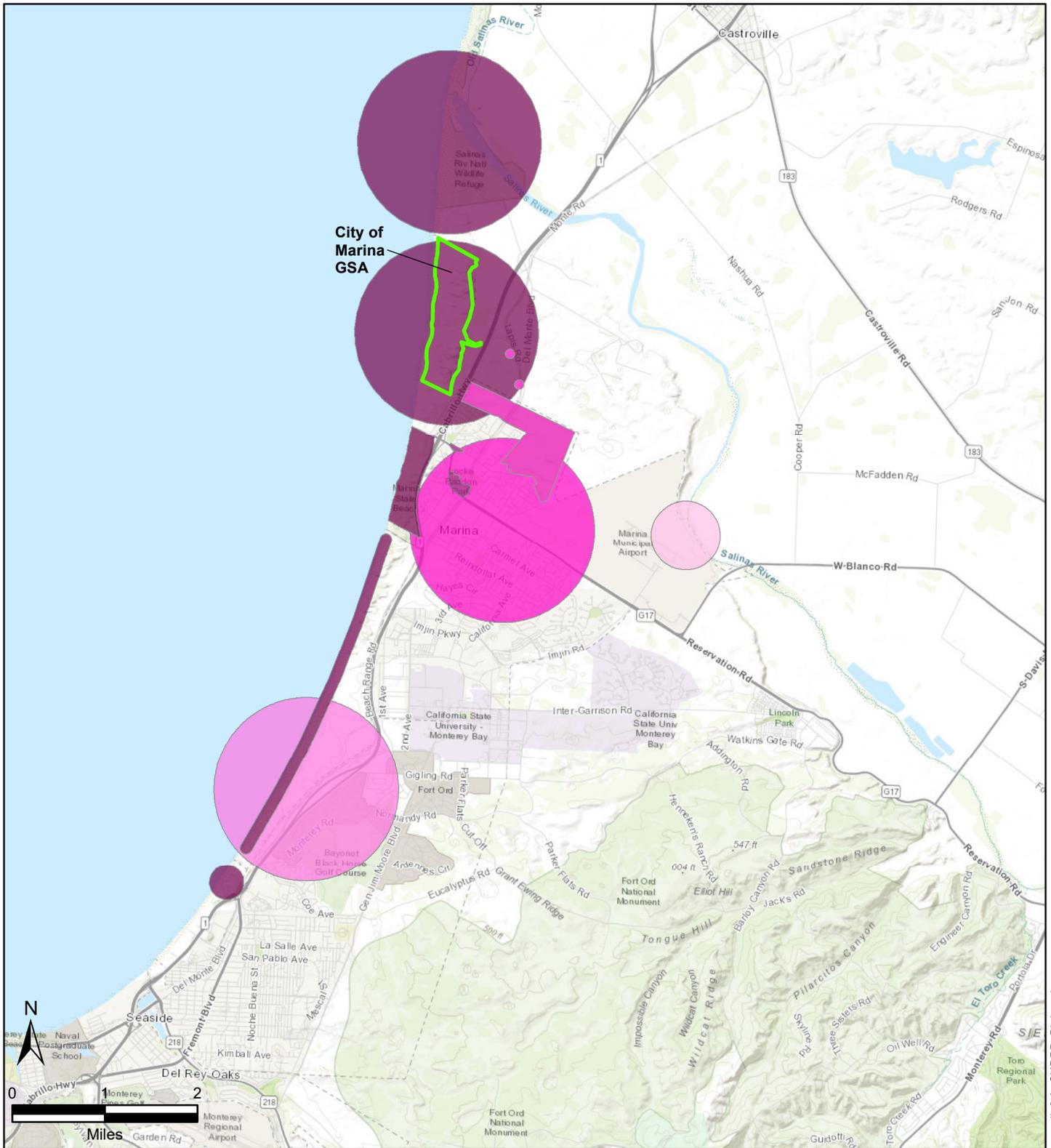
Legend

- City of Marina GSA Area
- Amphibians (Common Name)**
- California tiger salamander

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDDB>



DATE: DEC. 31, 2019



APPENDIX 2.A-2

CNDDB Bird Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

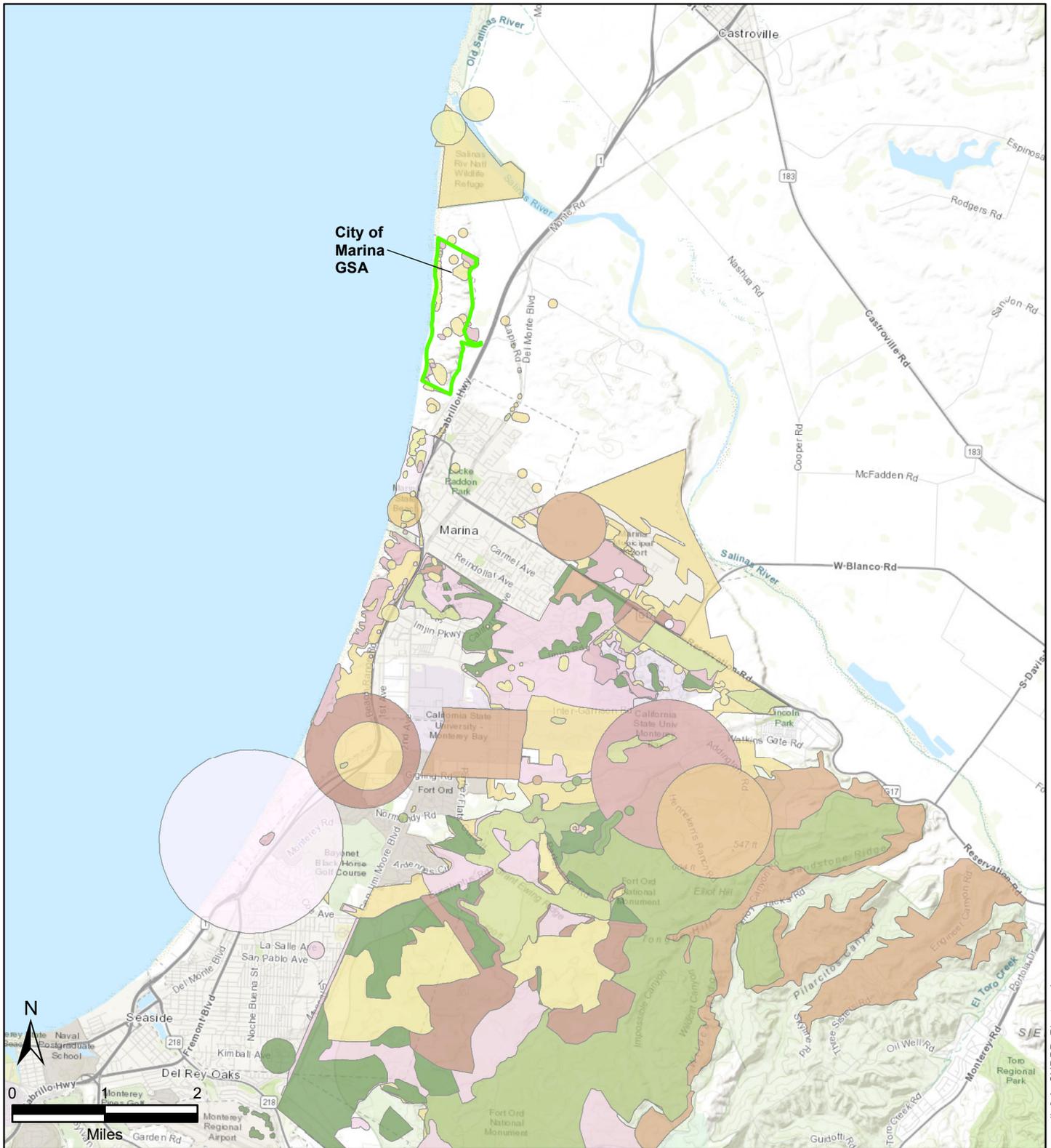
Legend

- City of Marina GSA Area
- Burrowing owl
- Birds (Common Name)
- California horned lark
- Ferruginous hawk
- Bank swallow
- Tricolored blackbird
- Western snowy plover

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDB>

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APPENDIX 2.A-3

CNDDB Plant Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

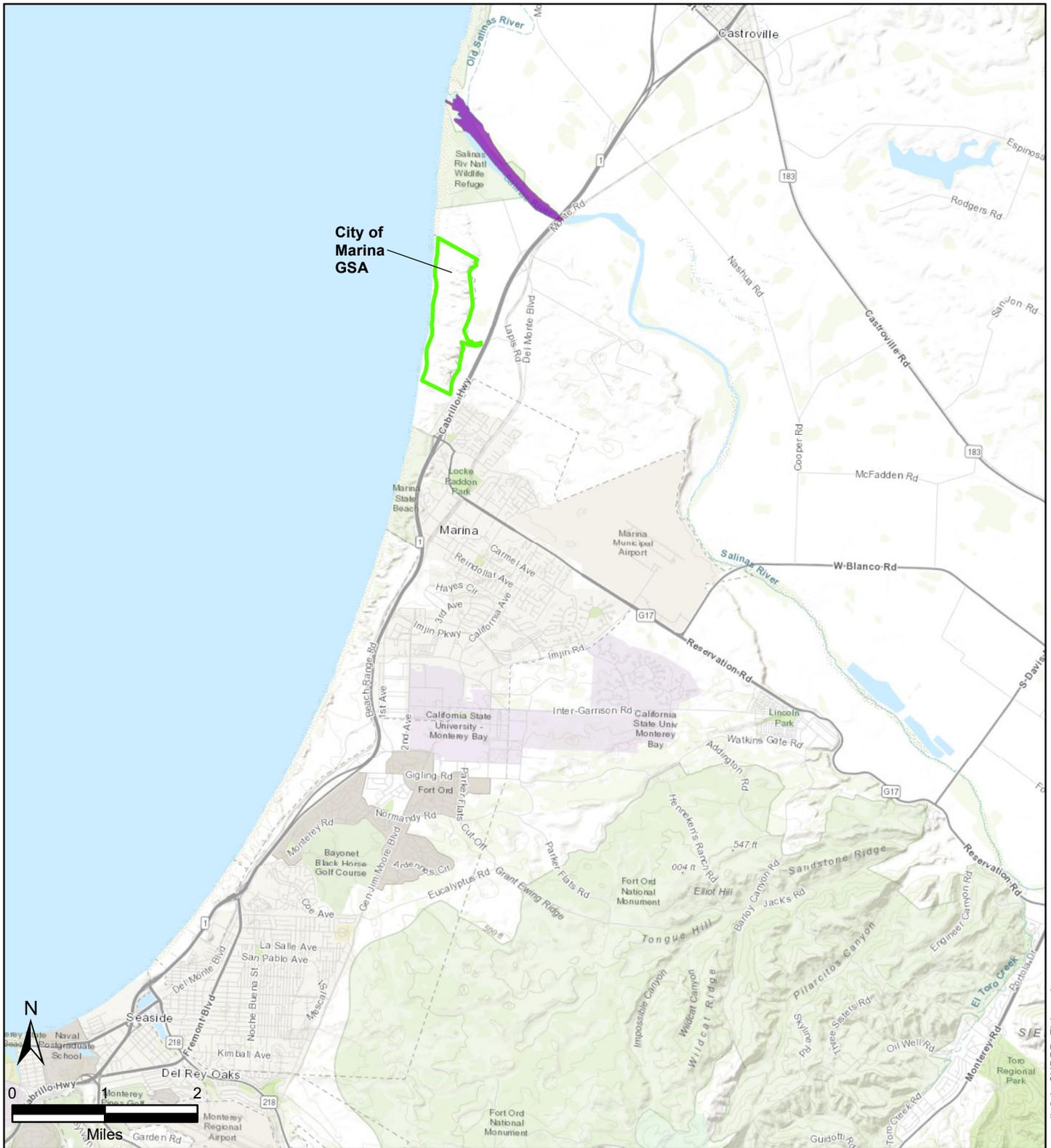
Legend

- | | | | |
|-----------------------------|----------------------|----------------------------------|---------------------|
| City of Marina GSA Area | Menzies' wallflower | Toro manzanita | Seaside bird's-beak |
| Plants (Common Name) | Monterey gilia | Yadon's rein orchid | |
| Eastwood's goldenbush | Monterey spineflower | Northern curly-leaved monardella | |
| Fort Ord spineflower | Pajaro manzanita | Pink Johnny-nip | |
| Hooker's manzanita | Point Reyes horkelia | Sand-loving wallflower | |
| Kellogg's horkelia | Santa Cruz clover | Sandmat manzanita | |

Sources: ESRI Map Service Imagery, <https://wildlife.ca.gov/Data/CNDDB>

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APPENDIX 2.A-4

CNDDB Fish Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

 City of Marina GSA Area

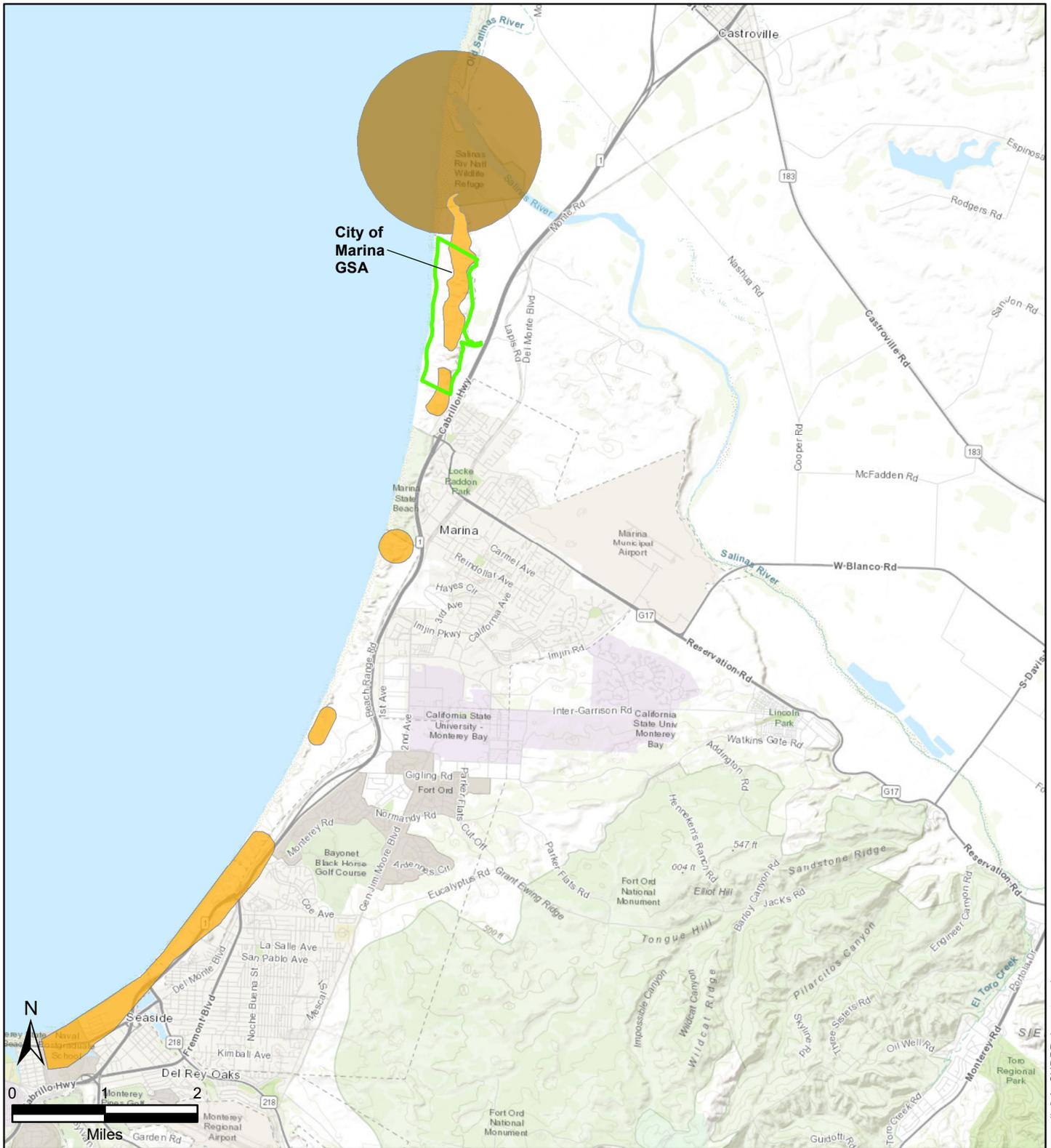
Fish (Common Name)

 Tidewater goby

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDB>

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APPENDIX 2.A-5

CNDDB Insect Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

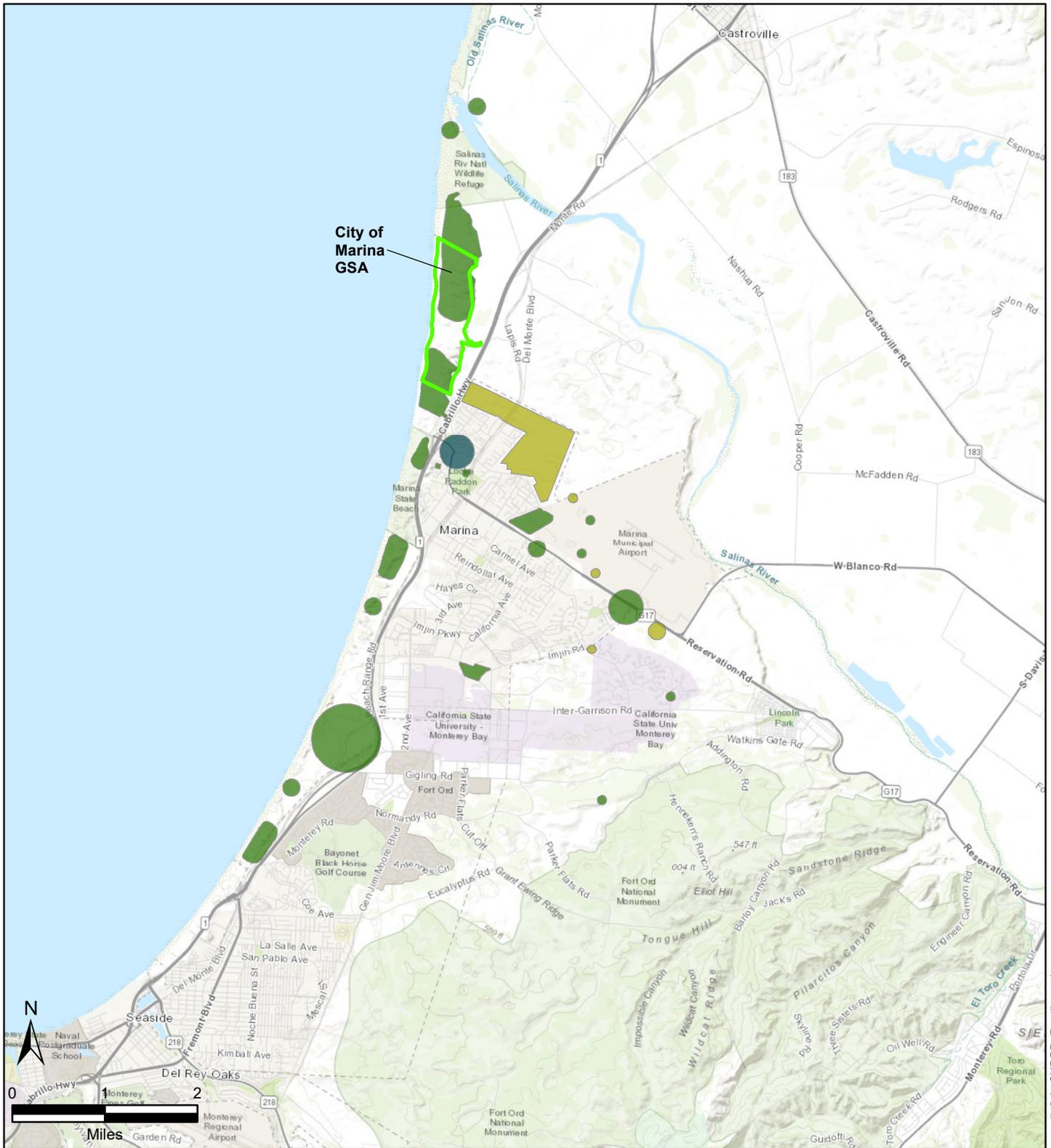
Legend

- City of Marina GSA Area
- Insects (Common Name)**
- Smith's blue butterfly
- Western bumble bee

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDB>

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APPENDIX 2.A-6

CNDDB Reptile Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

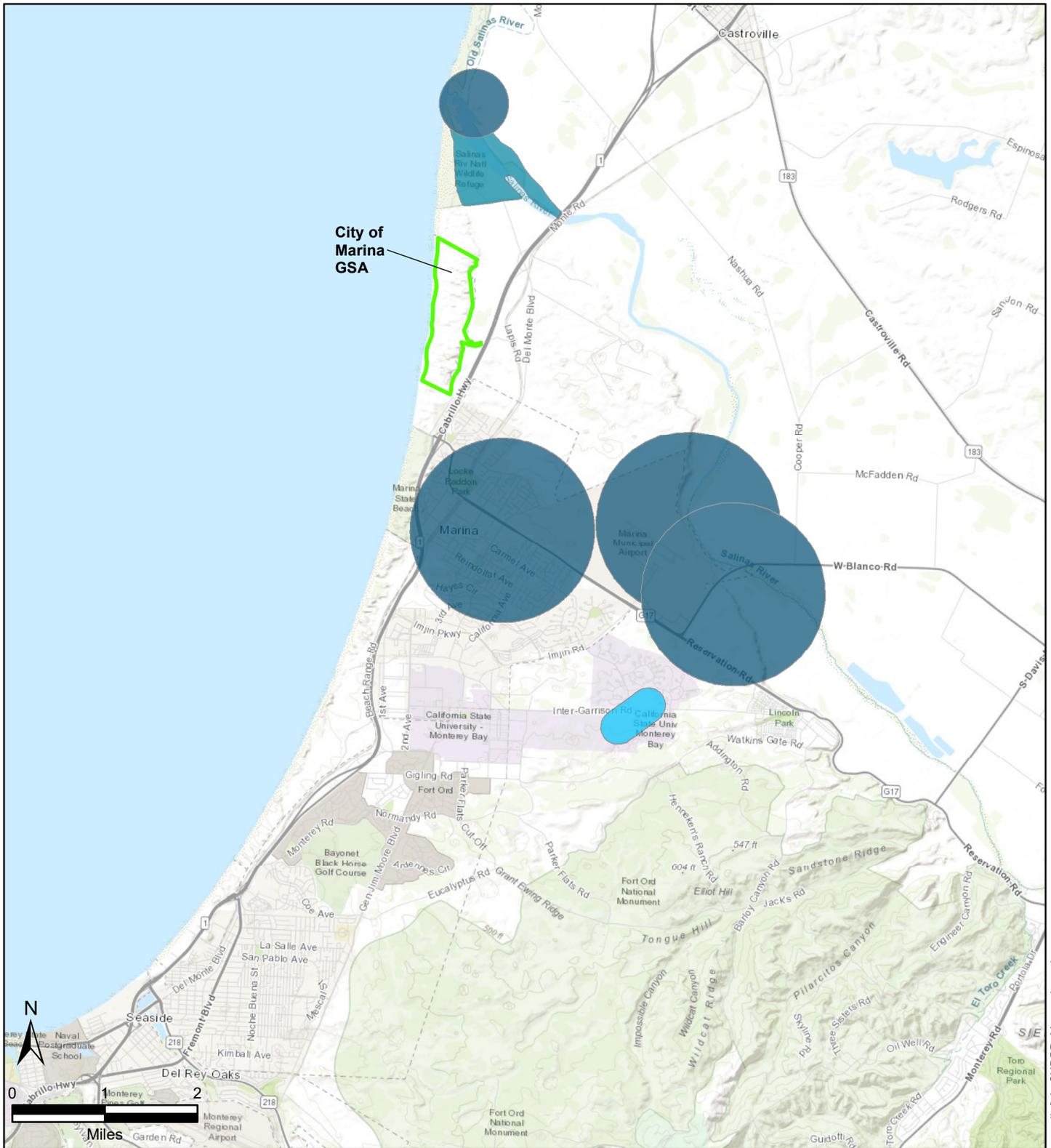
Legend

- City of Marina GSA Area
- Reptiles (Common Name)**
- Coast horned lizard
- Northern California legless lizard
- Western pond turtle

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDB>



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APPENDIX 2.A-7

CNDDB Mammal Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

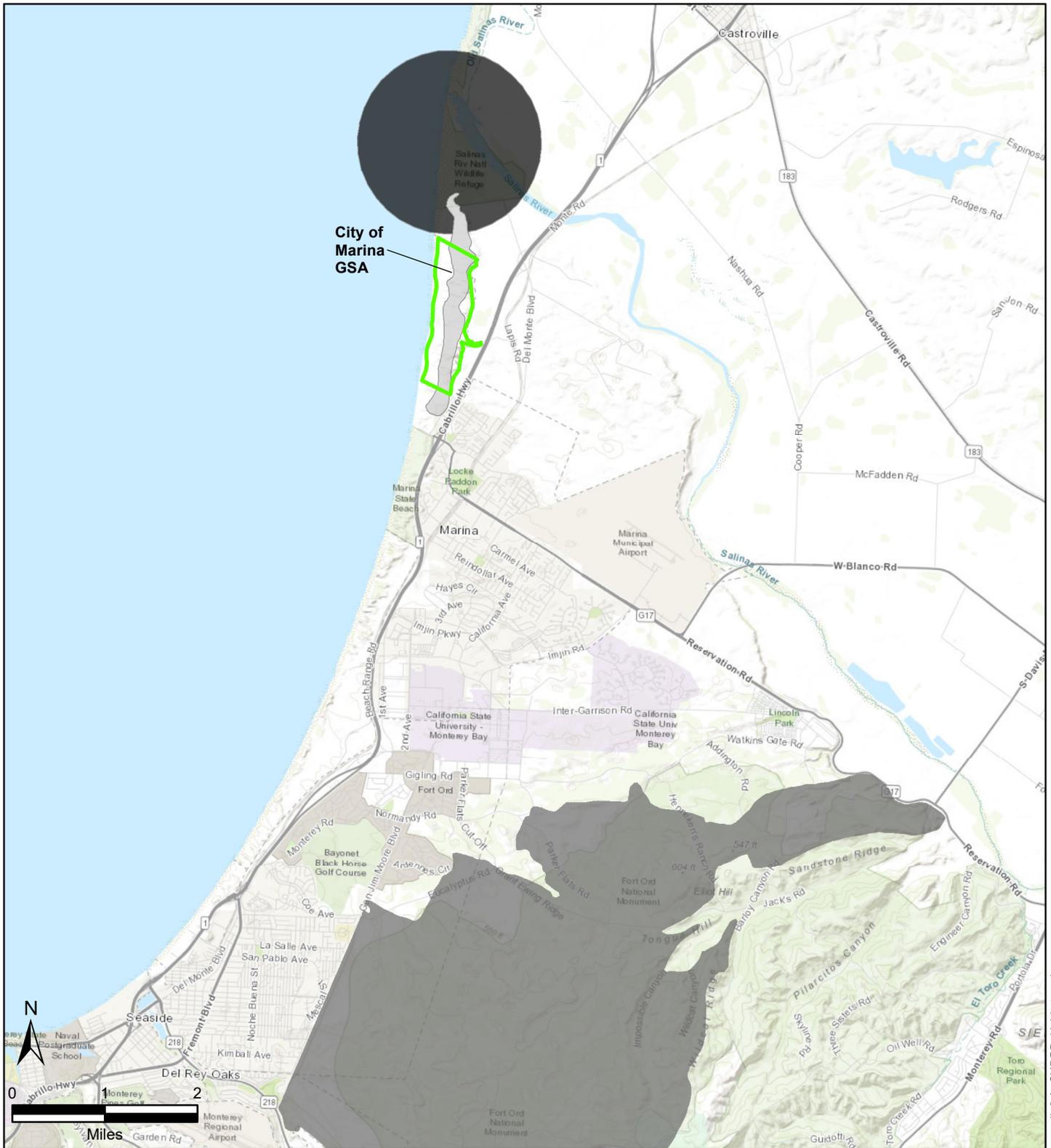
Legend

- City of Marina GSA Area
- Mammals (Common Name)**
- American badger
- Monterey shrew
- Salinas harvest mouse

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDB>

DATE: DEC. 31, 2019





APPENDIX 2.A-8

CNDDB Habitat Species Occurrences

Groundwater Sustainability Plan for the City of Marina GSA Area of the 180/400 Foot Aquifer Subbasin

Legend

- City of Marina GSA Area
- Habitat (Common Name)**
- Central Dune Scrub
- Central Maritime Chaparral
- Northern Coastal Salt Marsh

Sources: ESRI Map Service Imagery,
<https://wildlife.ca.gov/Data/CNDDB>

DATE: DEC. 31, 2019

